



GLOBAL ENTREPRENEURSHIP MONITOR

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Ten Years of Global Entrepreneurship Monitor: Accomplishments and Prospects

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The Global Entrepreneurship Monitor (GEM) is an annual assessment of the entrepreneurial activity, aspirations and attitudes of individuals across a wide range of countries. Initiated in 1999 as a partnership between London Business School and Babson College, the first study covered 10 countries; since then more than 85 'National Teams' from every corner of the globe have participated in the project, which continues to grow annually.

GEM is the largest ongoing study of entrepreneurial dynamics in the world.

GEM explores the role of entrepreneurship in national economic growth, unveiling detailed national features and characteristics associated with entrepreneurial activity. The data collected is 'harmonized' by a central team of experts, guaranteeing its quality and facilitating cross-national comparisons.

The program has three main objectives: to measure differences in the level of entrepreneurial activity between countries; to uncover factors leading to appropriate levels of entrepreneurship; and to suggest policies that may enhance the national level of entrepreneurial activity.

GEM is unique because, unlike other entrepreneurship data sets that measure newer and smaller firms, GEM studies, at the grassroots level, the behavior of individuals with respect to starting and managing a business. This approach provides a more detailed picture of entrepreneurial activity than is found in official national registry data sets.

In the Global Entrepreneurship Monitor Working Paper Series authors from within and outside the GEM consortium publish the results of ongoing research using GEM data for early dissemination of their research results. Papers 11.01 – 11.07 serve to get an idea of how GEM data can be used, and may be of particular use for researchers who are new to the data.

Submission of new working papers using GEM data is open to all. If you would like to have your paper included in the series, please submit it to the editor: Niels Bosma (nbosma@gemconsortium.org).

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TEN YEARS OF GLOBAL ENTREPRENEURSHIP MONITOR: ACCOMPLISHMENTS AND PROSPECTS

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ABSTRACT

In its first ten years, the Global Entrepreneurship Monitor (GEM) has had three main aims: to measure differences in the level of entrepreneurial activity between countries, to uncover factors determining national levels of entrepreneurial activity and to identify policies that would stimulate entrepreneurship. This paper reviews the theoretical and empirical contributions by the GEM consortium ten years after the presentation of its first Global Report in 1999. The evolution of GEM measures of entrepreneurship is tracked, and the quantity and quality of peer-reviewed scholarship based on GEM data and models are assessed. Prospects and recommendations for the future are noted, as GEM continues to expand and scholars outside the consortium increasingly employ GEM data in their work.

KEYWORDS: Global Entrepreneurship Monitor, Entrepreneurial Activity, Economic Development

JEL: E02, J24, L26, O11

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INTRODUCTION

This paper aims to make two main contributions. First, it documents the evolution of Global Entrepreneurship Monitor, which is possibly the world's largest cross-national collaborative social science research project, in terms of methodology and in terms of scholarly impact. Second, it recommends a number of ways in which the GEM project might evolve further and make more impact on entrepreneurship research, on entrepreneurship policy and practice, and ultimately on economic development.

Venture creation is an essential element of dynamic economic systems. Without individuals pursuing perceived business opportunities, little economic dynamism can be expected. However, the process of venture creation can take on many forms. Historical, cultural, economic, sociologic and demographic factors lead to vastly different characteristics of venture creation across the globe, as anyone who has travelled widely will observe. Yet the process of venture creation and its variance across regions and nations has been understudied in economic theory (Baumol 1968, Barreto 1989).

In the 1990s, interest in the role of entrepreneurship in economic development increased and the lack of comparable international data on entrepreneurship and venture creation became recognized as a serious issue (Reynolds, Storey and Westhead, 1994). Government databases were not comparable, and in many countries data on new venture creation was not systematically collected. This led to the establishment of a research initiative by a small group of academic scholars. The initiative was called the Global Entrepreneurship Monitor (GEM) and as it grew, three main objectives were set for it:

- To measure differences in the level of entrepreneurial activity between countries
- To uncover factors determining national levels of entrepreneurial activity
- To identify policies that may enhance national levels of entrepreneurial activity

Achieving the three GEM objectives would help establish how entrepreneurship relates to economic growth. Entrepreneurship is believed to contribute to economic development because entrepreneurs create new businesses, and new businesses create jobs, intensify competition, and may even increase productivity through technological change. Some studies argue that in recent decades, the development of new technologies and in consequence the emergence of new business models has shifted from large corporations to small and new ventures (Blau, 1987; Audretsch and Thurik, 2001;

Thurow, 2003). However, we have still much to learn about why entrepreneurship rates differ not only among countries at different stages of economic development but also among regions in a single country, and why not all entrepreneurial efforts have the same impact on economic development.

The idea of an index of entrepreneurship was originally conceived by Michael Hay in June 1997 as a “World Enterprise Index” which would “provide an authoritative, comparative assessment of enterprise and entrepreneurship at the national level” (Hay, 1997). GEM was created in September 1997 by Michael Hay and William D. Bygrave as a joint research initiative by London Business School and Babson Collegeⁱ. The first effort in 1999 analyzed 10 countries: the G7 countries (i.e., Canada, France, Germany, Italy, Japan, United Kingdom and United States) and three small countries: Denmark, Finland and Israel. Under Paul D. Reynolds, who was Principal Investigator of the project between 1998 and 2003, the project expanded to 32 participating countries in 2003.

As with any new venture’s growth, the expansion of GEM required a restructuring of the organization. The growing number of participating teams led to the establishment of the Global Entrepreneurship Research Association (GERA) in 2004. GERA, a charity registered in the UK, is a consortium consisting of all national teams participating in GEM research, the two founding organizations and global sponsors. Global Entrepreneurship Monitor is owned and managed by GERA. By 2010, GEM had conducted annual assessments in 80 countries, covering more than 80% of world population and almost all nations with globally significant economies. 59 countries participated in the 2009 GEM cycle, with a fairly even balance in terms of the three main stages of national economic development in recognized by the World Economic Forum (Schwab, 2010).

In this paper, we review the ten years of empirical and theoretical contributions of the GEM project. We do this by first reviewing the main methodological innovations that spurred GEM and that have occurred since then within the GEM project. Second we show how some of the GEM measures have contributed to our understanding of (i) the causes of national differences in entrepreneurship; and (ii) the relationship between entrepreneurship and economic development through a review of GEM-based peer-reviewed publications over the past ten years. Finally we critique the GEM project and propose recommendations that may benefit its future development.

THE EVOLUTION OF METHODOLOGY IN GEM

Since its inception, GEM has sought to explore the widely accepted link between entrepreneurship and economic development (Carree and Thurik, 2003; Acs, 2006; Audretsch 2007). The first GEM report explained: “The central focus was to bring together the world’s best scholars in entrepreneurship to study the complex relationship between entrepreneurship and economic growth” (Reynolds, Hay and Camp, 1999 p.3). To understand this central aim GEM defined a conceptual model that sets out key elements of the relationship between entrepreneurship and economic growth and the way in which the elements interact. It took as its starting point the recognition that while other scholars had defined the general national framework conditions for established enterprise to thrive (Schwab and Schwartz, 1997, 1998), a different set of “entrepreneurial framework conditions” (EFCs) and both entrepreneurial capacity and entrepreneurial opportunities were needed to enable new business activity. The generation of the first set of nine EFCs drew on an extensive literature review of entrepreneurship and economic growth, but also on the collective inputs of a group of scholars who were based in London Business School in 1997/1998. This emergent phase of GEM is described by Reynolds et al. (2005) and the first model is discussed in detail by Levie and Autio (2008). Our purpose is to review developments since the first model was developed.

After ten years of collecting empirical evidence, and continuous improvements in the measures adopted, GEM researchers revised the GEM model to reflect the complexity of the *causal relationship* between entrepreneurship and economic development globally (Bosma et al., 2009; Bosma and Levie 2010). This revised model is founded on the concept that the contribution of entrepreneurs to an economy varies according to its phase of economic development (Wennekers et al., 2005; Gries and Naude, 2008), and on the realisation that the Global Competitiveness Index, on which the GEM model drew for its General National Framework Conditions, had evolved considerably since the late 1990s. The revised model introduced a more nuanced distinction between phases of economic development, in line with Porter’s typology of “factor-driven economies”, “efficiency-driven economies” and “innovation-driven economies” (Porter et al., 2002), and recognized that GEM’s unique contribution was to describe and measure, in detail, the conditions under which entrepreneurship and innovation can thrive.

The revised model also incorporated three main components that capture the multi-faceted nature of entrepreneurship: entrepreneurial attitudes, entrepreneurial activity, and entrepreneurial aspiration. They are presented in the model as components of a “black box” that contributes innovation and jobs in an economy, but how they affect and reinforce each other is not spelled out in detail. This ambiguity was deliberate; it reflected the view that all three elements may affect each other rather than being components of a linear process and it was expected that further theoretical and empirical work would open up this black box. While the first model included capability and opportunity, it was never clear – and scholars still dispute – whether these are objective realities or subjective constructs, and aspiration was notably absent from the model. Aspiration is relevant because researchers increasingly realize that all entrepreneurial activity does not equally contribute to development. For example, in many countries, much employment creation comes from a small number of ambitious, fast-growing new businesses (Autio, 2007). The original and revised GEM models are shown in Figure 1.

-Figure 1 here-

The revised GEM model has a new dynamic element in that it incorporates an understanding of how economies change as they develop, and the changing nature and contribution of entrepreneurship in that development. For factor-driven economies, economic development is primarily driven by basic requirements: development of institutions, infrastructure, macroeconomic stability and health and primary educationⁱⁱ. In efficiency-driven economies, government focus is (or should be) on ensuring smooth mechanisms such as a proper functioning of the market; higher education systems, goods and labor markets and technological readiness. Even though these conditions are not directly related to entrepreneurship in the Schumpeterian sense of “creative destruction”, they are indirectly related since the development of markets will also attract and enable more entrepreneurship. Finally for countries whose economic development is primarily innovation-driven, entrepreneurial framework conditions become more important as levers of economic development than basic requirements or efficiency enhancers. The outcome of the model is national economic growth through, for example, job creation and technical innovation. The GEM data collection efforts allow for an exploration of the role of entrepreneurship in national economic development. GEM’s ability to map this territory grows with each annual cycle as combined sample sizes grow and as trends over time become apparent. The GEM 2001-2010 Adult Population Surveys include more than

1,350,000 data points, with most prominent country-level coverage from Spain (some 185,000 observations) and the United Kingdom (over 200,000 observations).

While entrepreneurship is a multifaceted phenomenon with many different meanings and definitions, GEM operationalizes entrepreneurship as: “Any attempt at new business or new venture creation, such as self-employment, a new business organization, or the expansion of an existing business, by an individual, a team of individuals, or an established business.” Thus, while GEM defines entrepreneurship rather narrowly as new business activity, it takes a broad view of what it recognizes new business activity to be. For example, unlike many official records of new business activity, GEM’s definition is not restricted to newly registered businesses.

GEM’s focus on individuals as units of observation enables collection of information on the entrepreneurial motivations, aspirations and other characteristics of individuals. Using this information enables researchers to employ units of analysis most appropriate to their research objectives. For example, the GEM database allows the exploration of individual or business characteristics, as well as the causes and consequences of new venture creation. This is also what makes the country comparisons particularly interesting; it is not only about ‘how many’ people are involved in entrepreneurship; it is also about exploring differences in types and phases of entrepreneurship process. As a result, a wide range of entrepreneurial initiatives has been uncovered. For example, a group of high-expectation entrepreneurs has been defined and studied (Autio, 2007).

Uncovering differences in the level of entrepreneurial activity among countries

Without a doubt one of the main contributions of the GEM project is the development of consistent, harmonized and internationally comparable measures of entrepreneurial activity. To calculate these measures, GEM has two guiding principles. The first guiding principle is that entrepreneurship *is a process*, and the second is that it is undertaken by *individuals*. This differentiates GEM measures from other data sets that measure new business registrationsⁱⁱⁱ. The individuals that follow the entrepreneurial process constitute the base of GEM measurements. One of the most recognized, and cited, GEM measures is Total early-stage Entrepreneurial Activity (TEA). Introduced in the 2000 Global Report and refined in 2001, this measure was originally called the GEM Total Entrepreneurial Activity (TEA) Index. The acronym TEA has been retained in the

revised description, which recognizes that TEA does not measure all entrepreneurial activity, but more specifically entrepreneurial activity at the early stages of the process, from nascent entrepreneurship through to new business ownership and management. Specifically, TEA prevalence rates are calculated as the sum of people aged 18-64 who are involved in entrepreneurial activity as either nascent entrepreneurs or new business owners^{iv}. TEA and its components form a central part of many GEM-related reports. Table 1 summarizes the TEA rates of all GEM participant countries from 2001 to 2010.

--Table 1 here--

It is important to realize that the TEA rate is a participation rate – of individuals involved in the early-stage of venture creation - and as such does not reflect a linear relationship between entrepreneurship and economic development (Acs, 2006). Neither does it reflect any entrepreneurial activity taking place in established, more mature businesses, other than new business spinoffs sponsored by parent companies. Therefore the direct application of the TEA as an overall measure of entrepreneurial behavior in a country has limitations (Hindle, 2006). But, as the revised model shows, the relationship between entrepreneurship and development is not that simple, and TEA should not be used as a simple ranking of entrepreneurship among nations. As Bosma et al. (2009) discuss, the revised GEM model does not suggest that higher TEA rates are always to be preferred. In factor-driven economies, for example, a reduction in the TEA rate may be seen as a good sign because it may signal a decline in the rate of necessity entrepreneurship (people who start businesses because they have no other options on the job market). Increases in the TEA rate may occur when the general economic climate is on a cyclical growth trend and market opportunities are growing. In innovation-driven economies, a high TEA rate may be specific to regional economic, demographic and cultural contexts. The same TEA rate in two nations or regions may mask differences in type and aspiration of entrepreneurs between these locations.

The search for new ways to measure entrepreneurship using GEM data for policy impact

By keeping the main GEM indices the same over the years, paired with a gradual expansion of new countries while retaining most of the countries included in the study,

GEM analysis increasingly allows time series or pseudo-panel analysis. This should prove to be valuable for exploring causal relationships concerning causes and consequences of entrepreneurship. At the same time, by developing new measures of entrepreneurial activity in addition to TEA, GEM can help educate and inform a more sophisticated understanding of the complexity of the phenomenon. GEM has a track record of innovation in this regard, including distinguishing between opportunity-driven and necessity-driven entrepreneurship in the 2001 GEM report, and between low expectation and high expectation entrepreneurship (Autio, 2007).

The latest GEM executive reports are a clear indication that GEM is moving beyond the focus on a quantity-related TEA index (Bosma et al., 2009; Bosma and Levie, 2010; Kelley et al., 2011). Besides the prevalence rate of activity, the report puts more emphasis on other quality-related characteristics of the early phase of new venture creation, such as innovation, high growth potential, business discontinuation and the environmental factors of entrepreneurship perception. An example of redefinition is the calculation method for opportunity-driven early-stage entrepreneurial activity (opportunity-TEA). Since 2007 this measure includes only those who are pulled to entrepreneurship by opportunity and because they desire independence or to increase their income, not those who are pushed to entrepreneurship out of necessity or those who sought only to maintain their income. These relative prevalence rates from 2007 and 2008 are shown in Figure 2. The countries with high relative prevalence of improvement-driven opportunity entrepreneurship are primarily innovation-driven countries. In these countries, opportunities may be expected to be more abundant, and individuals may have more alternatives to make a living. Therefore the trend line that plots how opportunity TEA rates vary with GDP per capita has increasing slope. Necessity entrepreneurship shows the opposite association.

-Figure 2 here-

The wide number of measures provided by GEM is enabling a “new generation” of more complex entrepreneurship measures, something that is being proposed and developed both within and outside the GEM community. An example of these “next step” measures is the recent work of Acs and Szerb (2011): The Global Entrepreneurship and Development Index (GEDI). The GEDI offers a measure of the *quality and quantity* of the business formation process in 65 of the most important countries in the world, by capturing the interaction of entrepreneurial attitudes, activity and aspirations with

relevant institutional variables, something that has not been attempted before but which fits the revised GEM model. The index construction integrates 31 variables, 17 from GEM, and 14 from other data sources, into 14 pillars, three sub indexes and a “super index”. Using this complex index the relationship between entrepreneurship and economic development is positive and high correlated (see Figure 3).

-Figure 3 here-

The GEDI is not a replacement for TEA, or any of the other measures that GEM has created. The main indices discussed in the GEM Global Reports are all relatively simple indicators (derived directly from the surveys) with clear interpretations. The GEDI is a very useful – but also a more complex – measure because it harnesses the information from multiple GEM measures, as well as measures available from other sources, to create a wider measure of *productive entrepreneurship* in general in a nation. The latter is a priority issue of entrepreneurship policy makers in several countries. The GEDI could also be extended to compare regions in one country, or sub-regions of a global region such as the EU.

AN ASSESSMENT OF THE IMPACT OF GEM ON ENTREPRENEURSHIP SCHOLARSHIP AND THE WIDER WORLD

A familiar output of GEM is its annual reports. The GEM Consortium produces annual global reports and other reports related to special topics like High Growth/High Expectation Entrepreneurship, Financing and Women Entrepreneurship. Table 2 shows the number of downloads of annual reports from the gemconsortium.org website between May 2007 and 31 July 2011. In sum, over 300,000 copies of GEM reports were downloaded during that four year period.

-Table 2 here-

Members of the GEM consortium publish not only annual GEM reports but also an increasing number of academic articles, using GEM data, in international peer reviewed journals. As GEM data becomes more and more available to scholars inside and outside the GEM community, the authorship of GEM-based data has widened. GEM-based research also is published in several languages and has become a key resource for

scholars, public policy and practitioners. In this section, we assess the impact of the GEM project on entrepreneurship scholarship. In order to assess the growth in the influence of GEM, we replicated a general proxy of GEM influence employed by Davidsson (2005, p 355). A general search for “Global Entrepreneurship Monitor” in Google in May 2010 yielded 79,300 hits, compared with 11,900 in May 2005 as reported by Davidsson. This is 566% more hits in five years. Google Scholar, a more refined search of academic-related literature on the internet, reported 6,640 hits. These numbers show an increasing impact of GEM on the Internet.

In order to refine our assessment of the academic impact of GEM, we made use of EBSCO, one of the leading sources of electronic databases for academic research. We performed an advanced search on 2nd March 2009 using EBSCO Host’s Business Source Complete database, including limited search with these specific restrictions: articles from only peer review academic journals, publications between 1999 and 2009 and only in English. We located 1,690 journal articles that include in their complete text or references any citation to the GEM Project. To refine the search to locate articles which were dependent in some way on GEM, and which are aimed squarely at entrepreneurship scholars, we used two main criteria: 1) search only “GEM based” articles, that is, publications that use GEM data in their empirical methods (main or complement source of data) and articles based on the GEM model that make a theoretical contribution; 2) search only in specific “entrepreneurship” journals that are indexed on ISI Web of Sciences®. Following to this second criterion, the selected journals were *Journal of Business Venturing*, *Entrepreneurship Theory and Practice*, *Small Business Economics*, *Entrepreneurship & Regional Development*, *International Small Business Journal* and *Journal of Small Business Management*.

Small Business Economics (SBE) hosted 30 articles, more than any other journal. SBE has published three special issues related to GEM’s Research Conferences. 18 of these articles are empirical and use multi-country samples. A further six of them conduct single country analyses. Another describes the GEM methodology and summarizes the first years of the project. The paper “*Global Entrepreneurship Monitor: Data Collection Design and Implementation 1998–2003*” by Reynolds et al. (2005) could be considered the “cornerstone” of the project and an introduction to GEM’s development and methodology. Three papers are introductions to special issues and two have a special characteristic, being related to Paul D. Reynolds’ “International Award for

Entrepreneurship and Small Business Research”.

Entrepreneurship Theory and Practice (ETP) and, *International Small Business Journal* have each published four articles during the period under review. It is worth noting in passing that a paper by Davidsson and Wiklund (2001) in ETP titled “Levels of analysis in entrepreneurship research: Current research practice and suggestions for the future” was one of the first peer-reviewed papers to mention GEM as a potential source of data for future research on entrepreneurship topics. *Journal of Business Venturing* and *Entrepreneurship & Regional Development* have each published three empirical GEM-based articles. To date, *Small Business Management* does not have any GEM-based articles. Table 3 gives a summary of all these articles. A more detailed overview, including the types and phases of entrepreneurship featuring in each paper, is provided in the Appendix. Table 3 shows that, whereas research into determinants of entrepreneurship seems to be most prominent, about a quarter of peer-reviewed articles in ISI-listed entrepreneurship journals also study the link between entrepreneurship and national (or regional) economic performance. Some entrepreneurial framework conditions (R&D transfer, commercial and legal infrastructure, physical infrastructure) appear to be covered less frequently than others (finance, government policies, education and training, cultural and social norms).

Due to the data-driven nature of the GEM project, most of the papers (84%) include an empirical section to answer particular research questions. The appendix shows the wide variety of research objectives for the set of 44 papers. Most empirical papers focus on the early-stage of entrepreneurship. Limited attention is paid to start-up intentions, owner-managers of established businesses, business discontinuations and informal investment. In some of these papers, use was made of GEM expert survey data in addition to adult population survey data. The national expert surveys capture information about these entrepreneurial framework conditions (see Levie and Autio, 2008).

- Table 3 here -

Finally, acknowledging the importance of papers outside the mainstream entrepreneurship journals and noting that GEM-based publications really took off from 2004 onwards, we widened the search again to include all GEM-based English-language peer-reviewed articles published between 2004 and 2010, using both the GEM

consortium's in-house list and a search from January 2004 to December 2010 on ABI-INFORM. This revealed 111 articles. We then coded the journal quality of these articles using the Harvey-Morris 2008 ABS ranking (published by the Association of Business Schools at www.the-abs.org.uk). The results are presented in Table 4. They show that the average rank (on a 1 to 4 scale) of GEM-based articles over the past six years is 2, but that around 40% of all articles are published in 3 or 4-rated journals. Ten of the 111 articles are in journals rated 4 by the Harvey-Morris ranking. Some of these highly ranked journal articles have been written by scholars outside the GEM consortium, using publicly available GEM data. This demonstrates increasing acceptance of the value of GEM data for scholarship.

DISCUSSION AND RECOMMENDATIONS

Before GEM, leading scholars were of the opinion that “average new firm birth rates are roughly similar across countries” (Reynolds et al, 1994, p. 443.) After GEM, it is hard to believe that anyone could have held that view. We now know that early-stage entrepreneurial activity rates can vary by a factor of ten across countries. Before GEM, many entrepreneurship academics, but few development economists, believed that entrepreneurship made an important contribution to economic growth. We now know that the link is much more complex and interesting than the “all or nothing” arguments of the past. Before GEM, many entrepreneurship scholars tended to view all entrepreneurship as a good thing. We now know that much of it is not driven by the pursuit of opportunity, especially in developing countries, and the ratio of necessity to opportunity entrepreneurship seems to be systematically linked to a economy's stage of economic development. It is perhaps these contributions – uncovering the vastly different quantity and quality of new business activity across nations, and fuelling study of the links between entrepreneurship and economic growth – that are GEM's main achievements.

Our literature search of GEM-based peer-reviewed scholarship has revealed that GEM is increasingly being integrated into high quality scholarship. Evidence for this includes recent publication of GEM-based articles in the highest-ranking journals in our field by scholars within and outside the GEM consortium of scholars. A recent book edited by Maria Minniti provides a comprehensive overview of current GEM-based

scholarship on entrepreneurial activity (Minniti 2011). There is also evidence that the wider world is actively using GEM reports – over 300,000 global and special topic reports have been downloaded from the gemconsortium.org website in the past four years. This excludes national reports. However, much remains to be done. Below we highlight some streams of research where GEM may provide a useful – if not essential – contribution in the near future. We also give some critical reflections and recommendations as to where the GEM project can be improved.

GEM data are increasingly suitable to exploring the link between entrepreneurship and economic growth, as samples are repeated in countries with different levels of economic development and as time series grow. As GEM has progressed, it has become evident that achieving higher levels of entrepreneurial activity may not be the best policy target for every economy, as we have discussed above in relation to necessity versus opportunity entrepreneurship. We therefore suggest the third objective should perhaps be refined as follows: “To identify policies that lead to appropriate national levels of entrepreneurial activity”.

We also encourage scholars to use GEM data to investigate the importance of several entrepreneurial framework conditions (EFCs) that are identified in the GEM model, but appear to be under-researched so far. Another under-researched item involves the discontinuation of businesses. GEM global reports have already shown a variety of reasons underlying discontinuation, many of them being *not* related to poor performance of the businesses (see e.g. Bosma and Levie, 2010). More sophisticated analysis could pinpoint what determines specific drivers of business discontinuation, as well as the direct and indirect relationships between discontinuations and new business activity.

GEM’s current efforts in making the data more accessible and transparent to scholars outside GEM will probably lead to a new boost in this research domain. The advantage of GEM data is that different *types* of entrepreneurial activity as practiced by individuals can be examined, across countries or regions and over time. Different types of entrepreneurship may prove to have different effects on economic growth, at different stages of economic development. The next few years of data collection will give much information on how the global economic crisis has affected entrepreneurship. This will also lead to increasing knowledge on the role of entrepreneurial activity in overcoming crises. Advanced econometric methods, such as dynamic (panel data) time series analysis and multilevel regression techniques should be employed, that acknowledge the micro-

macro relations between entrepreneurship and economic growth. Recent papers by Koellinger and Thurik (2009) and Autio and Acs (2010), employing both GEM data and data from other sources, provide interesting directions in these areas.

It is also expected that GEM data can be used increasingly for researching the interplay between institutions, entrepreneurship and development. In the past few years, GEM has welcomed many new factor-driven and efficiency-driven countries. The development of the Global Entrepreneurship Index picks up these challenges and could evolve into a useful tool for national policy makers across the globe. However, GEM may need to adjust its research methodology to make it fit better the demands of high quality fieldwork research in developing countries. This means that the questionnaire should be relatively simple in construction. The increasing use of mobile phones also poses a challenge to data collection. The potentially different interpretation of questions in different countries (Baumol et al., 2007, Godin et al., 2008) is an issue that deserves attention. In any case, we expect that the increasing number of countries – and the great variation among these countries - will definitely provide more answers to questions relating to the third GEM objective, to identify policies that lead to appropriate national levels of entrepreneurial activity,

Another research area that is likely to expand in future is GEM-based studies at the sub-national level. As databases for several years are pooled, more country databases will have sufficient sample sizes to identify regional differences in entrepreneurial attitudes, activity and aspirations. A critical issue will be to identify what types of regions are most appropriate for this research. Initial multilevel approaches using GEM data confirm that, besides the personal endowments of individuals within regions, other regional effects proposed by the literature appear to be significant such as market potential, unemployment rates, urbanization and knowledge spillovers (Bosma, 2009).

Increasingly, scholars who are not intimately familiar with the GEM database will be employing GEM data, freely available from the GEM website, for sophisticated analyses that combine GEM data with other national and international databases. Care will need to be taken by the academy to avoid incorrect weightings, misattribution of constructs to variables, over-fitting of data, and neglect of control, moderating and mediating variables as these could reduce the value of GEM data for scholarship and policy. Although the main responsibility lies with the authors employing GEM data, GEM could do more to

provide researchers with essential information on the data sets. Steps to achieve this are being taken at this point. Setting up a GEM working paper series for papers using GEM data may also help take GEM research to a higher level. Finally, the GEM consortium itself will need to continually innovate both in measures and in methods if it is to remain at the forefront of international research in entrepreneurship and economic development.

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Table 1: Total early-stage Entrepreneurial Activity rates (TEA), 2001-2010

Economy	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1 Algeria									16.7	
2 Angola								22.7		32.4
3 Argentina	9.8	14.2	19.7	12.8	9.5	10.2	14.4	16.5	14.7	14.2
4 Australia	13.3	8.7	11.6	13.4	10.5	11.9				7.7
5 Austria					5.3		2.4			
6 Belgium	3.1	3.0	3.9	3.4	3.9	2.7	3.1	2.9	3.5	3.7
7 Bolivia								29.8		38.6
8 Bosnia & Herzegovina								9.0	4.4	7.7
9 Brazil	11.2	13.5	12.9	13.5	11.3	11.7	12.7	12.0	15.3	17.5
10 Canada	10.2	9.5	8.0	8.8	9.3	7.1				
11 Chile		15.7	16.9		11.1	9.2	13.4	13.1	14.9	16.8
12 China		12.3	11.3		13.7	15.7	16.4		18.8	14.4
13 Colombia						22.4	22.7	24.5	22.4	20.5
14 Costa Rica										13.5
15 Croatia		3.6	2.6	3.7	6.1	8.5	7.3	7.6	5.6	5.5
16 Czech Republic						7.8				
17 Denmark	5.1	6.5	5.9	5.3	4.7	5.3	5.4	4.0	3.6	3.8
18 Dominican Republic							16.8	20.4	17.5	
19 Ecuador				27.2				17.2	15.8	21.3
20 Egypt								13.1		7.0
21 Finland	4.5	4.6	6.9	4.4	4.9	5.0	6.9	7.3	5.2	5.7
22 France	2.6	3.1		6.0	5.4	4.4	3.2	5.6	4.3	5.8
23 Germany	5.8	5.2	5.2	4.4	5.4	4.2		3.8	4.1	4.2
24 Ghana										33.9
25 Greece			6.8	5.8	6.5	7.9	5.7	9.9	8.8	5.3
26 Guatemala									19.2	16.3
27 Hong Kong		3.4	3.2	3.0			9.9		3.6	
28 Hungary	8.8	6.5		4.3		6.0	6.9	6.6	9.1	7.1
29 Iceland		11.3	11.2	13.6	10.6	10.2	12.5	10.1	11.4	10.6
30 India	10.2	15.9				10.1	8.5	11.5		
31 Indonesia						19.3				
32 Iran								9.2	12.0	12.4
33 Ireland	11.4	9.1	8.1	7.7	9.8	7.4	8.2	7.6		6.8
34 Israel	6.0	7.0		6.6			5.4	6.4	6.1	5.7
35 Italy	6.0	5.7	3.1	4.3	4.9	3.5	5.0	4.6	3.7	2.3
36 Jamaica					17.0	20.3		15.6	22.7	10.5
37 Japan	1.9	1.7	2.8	1.5	2.2	2.9	4.3	5.4	3.3	3.3
38 Jordan				18.2					10.2	
39 Kazakhstan							9.4			
40 Korea Rep.	12.3	14.5						10.0	7.0	6.6
41 Latvia					6.6	6.5	4.5	6.5	10.5	9.7
42 Lebanon									15.0	
43 Macedonia								14.5		8.0
44 Malaysia						11.1			4.4	4.6
45 Mexico	19.1	12.4			5.9	5.3		13.1		12.7
46 Montenegro										14.9
47 Morocco									15.8	
48 Netherlands	4.7	4.6	3.6	5.1	4.3	5.4	5.2	5.2	7.2	7.2
49 New Zealand	16.3	14.0	13.6	14.7	17.6					
50 Norway	6.4	8.6	7.4	6.9	9.1	8.9	6.2	8.7	8.5	7.7

	Economy	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
51	Pakistan										9.0
52	Panama									9.6	
53	Peru				40.3		40.1	25.9	25.6	20.9	27.2
54	Philippines						20.4				
55	Poland	8.0	4.0		8.8						
56	Portugal	5.2			3.8			8.8			4.5
57	Puerto Rico							3.1			
58	Romania							4.0	4.0	5.0	4.3
59	Russia	5.8	2.5				4.8	2.7	3.5	3.9	3.9
60	Saudi Arabia									4.7	9.4
61	Serbia							8.6	7.6	4.9	
62	Singapore	5.1	5.9	4.9	5.7	7.2	4.8				
63	Slovenia		4.6	4.0	2.6	4.4	4.6	4.8	6.4	5.4	4.7
64	South Africa	4.3	6.3	4.2	5.3	5.1	5.1		7.8	5.9	8.9
65	Spain	5.4	4.6	6.6	5.1	5.7	7.3	7.6	7.0	5.1	4.3
66	Sweden	3.8	3.9	4.1	3.7	4.0	3.4	4.2			4.9
67	Switzerland		7.1	7.3		6.0		6.3		7.7	5.0
68	Syria									8.5	
69	Taiwan		4.3								8.4
70	Thailand		18.9			20.7	15.2	28.4			
71	Tonga									17.4	
72	Trinidad & Tobago										15.1
73	Tunisia									9.4	6.1
74	Turkey						6.1	5.6	6.0		8.6
75	Uganda			28.8	31.6					33.6	31.3
76	United Kingdom	5.4	5.4	6.4	6.2	6.2	5.8	5.5	5.9	5.7	6.2
77	United Arab Emirates						3.7	8.4		13.3	
78	United States	11.1	10.5	11.9	11.3	12.4	10.0	9.6	10.8	8.0	7.6
79	Uruguay						12.5	12.2	11.9	12.2	11.7
80	Vanuatu										52.2
81	Venezuela			26.8		24.9		20.2		18.7	
82	West Bank & Gaza									8.6	10.4
83	Yemen									24.0	
84	Zambia										32.6

Source: GEM Adult Population Surveys.

Table 2: Downloads of GEM executive and special topic reports, 09/05/2007 – 31/07/2011

<i>Global Executive Reports</i>	<i>Special Topic Reports</i>
2010 GEM Global Report – 24,210	GEM 2005 High Expectation Report – 13,567
2009 GEM Global Report – 55,107	GEM 2007 High Growth Report – 9,343
2008 GEM Global Report – 43,360	GEM 2007 Women's Report – 10,865
2007 GEM Global Report – 37,049	GEM 2006 Women's Report – 6,015
2006 GEM Global Report – 33,713	GEM 2005 Women's Report – 6,028
2005 GEM Global Report – 6,711	GEM 2004 Women's Report – 4,069
2004 GEM Global Report – 15,999	GEM 2006 Financing Report – 3,478
2003 GEM Global Report – 4,644	GEM 2004 Financing Report – 2,820
2002 GEM Global Report – 2,859	GEM Education and Training – 14,413
2001 GEM Global Report – 2,123	
2000 GEM Global Report – 3,280	
1999 GEM Global Report – 5,017	

Table 3: Content Summary of 44 Papers published ISI Entrepreneurship Journals

Item	Number of papers
<i>Journals (ABS Grade 2010)</i>	
Small Business Economics (3)	30
Entrepreneurship Theory and Practice (4)	4
Journal of Business Venturing (4)	3
Entrepreneurship and Regional Development (3)	3
International Small Business Journal (3)	4
Conceptual/Methodology/Special papers	8
Papers with GEM-based empirical sections	37
- <i>Examining determinants of entrepreneurship</i>	30
EFC: Finance	15
EFC: Government Policies	13
EFC: Government Programs	7
EFC: Education an training	10
EFC: R&D Transfer	3
EFC: Commercial, Legal Infrastructure for Entrepreneurship	3
EFC: Internal Market Openness	5
EFC: Physical Infrastructure for Entrepreneurship	2
EFC: Cultural, Social Norms	13
- <i>Linking entrepreneurship to economic performance</i>	10

Note: detailed information in the Appendix. Information on EFC coverage per paper is omitted in order to preserve space. It is available on request.

Table 4 -- GEM-based articles 2004 to 2010 by ABS journal ranking

	No. of papers (peer-reviewed)	No. of level 4 papers	% of level 3 or 4 papers	Average level of papers
2010	15	2	20	1.1
2009	16	1	32	2.1
2008	19	3	53	2.1
2007	27	3	44	1.9
2006	10	1	50	2.1
2005	14	0	71	2.4
2004	11	0	0	0.2

Figure 1 – GEM original model (A) and revised model (B)

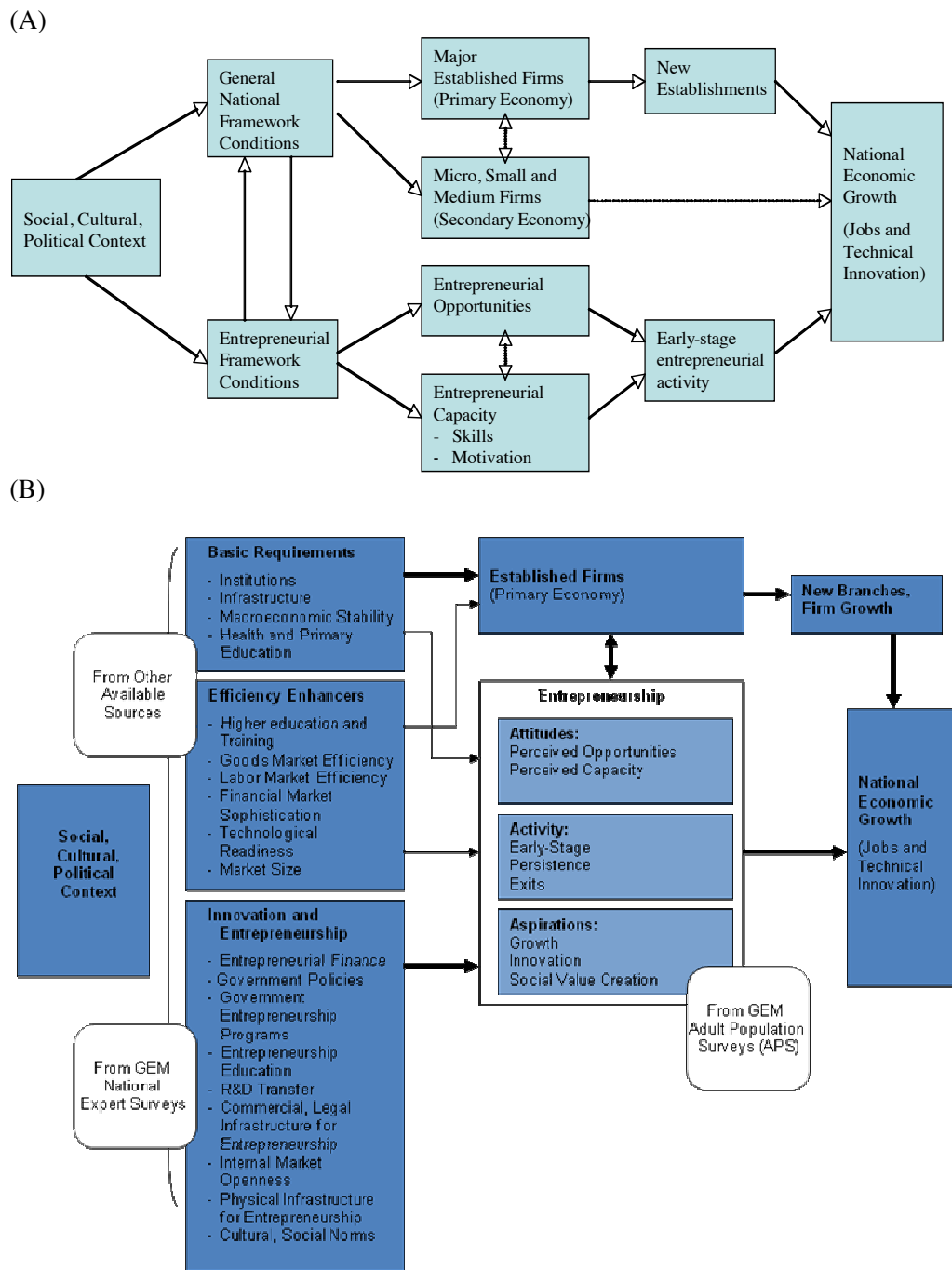


Figure 2 – Improvement-Driven Opportunity and Necessity Rates 2007-2008

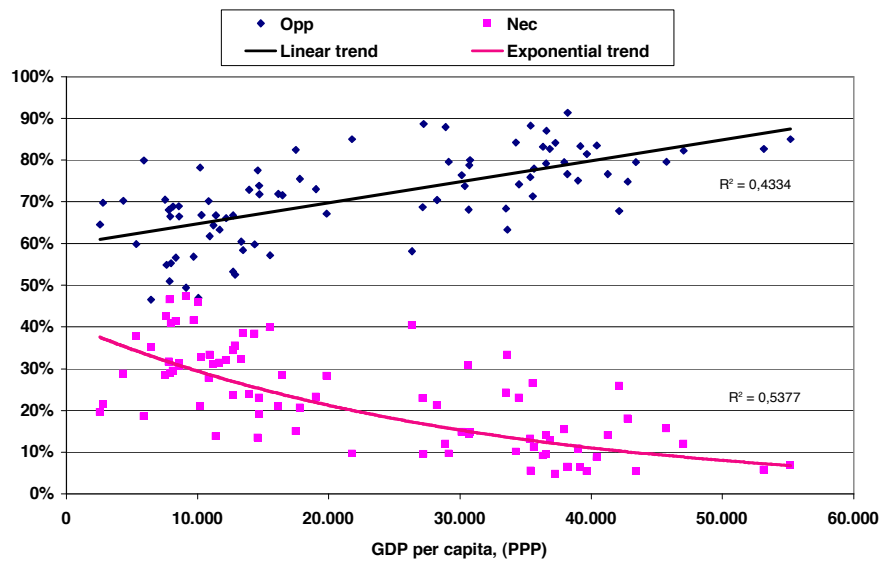
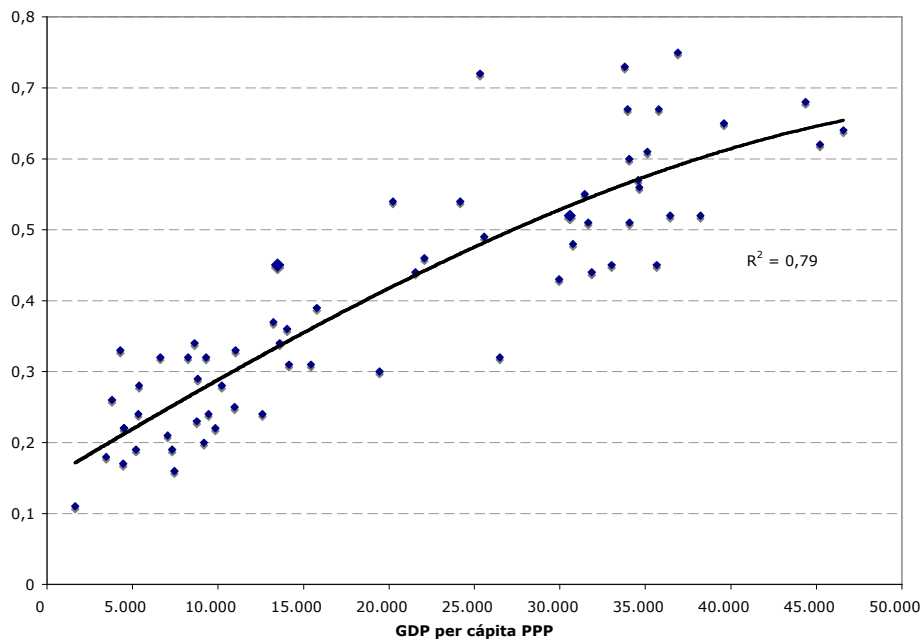


Figure 3 – The New Global Entrepreneurship Index in Terms of GDP PPP



Appendix: Detailed Summary of 44 Papers published ISI Entrepreneurship Journals

Authors	Type	Sample	Main objective	Main results	Theoretical background	Types of entrepreneurship	Phases of entrepreneurship	Determinants	Link to growth
<i>Small Business economics</i>									
Wong et al. (2005)	Emp.	Country-level study: 37 countries, 2002	Authors use a Cobb-Douglas approach to explore firm formation and technological innovation as separate determinants of growth, and focus on the effect of different types of entrepreneurship	Only high growth potential types of entrepreneurship are linked with economic growth, next to the positive effect of innovation on economic growth	Solow/Romer growth theories	Overall, Necessity/opportunity, high growth potential	Early-stage	NO	YES
Sternberg and Wennekers (2005)	Intro		Introduction special issue						
Reynolds et al. (2005)	Conc. / Meth.		Description of GEM methodology						
Arellano and Minniti (2005)	Emp.	Individual level data from 28 countries, 2002 (N=80,117)	Authors assess the link between individuals' characteristics (and perceptions in particular) and new business creation	Perceptual variables significantly correlated with new business creation, across all countries and for males as well as females	Human capital theory, psychology and sociology	Overall	Nascent entrepreneurs	YES	NO
Arellano and De Clercq (2005)	Emp.	Individual level data from Belgium and Finland, 2002 (N=4536)	Authors examine individuals' embeddedness in networks in terms of their perception of entrepreneurial opportunities and focus on (1) individuals belonging to specific residential areas in terms of network cohesion and (2) individuals' access to networks based on human capital	Nature of residential area influences perception of entrepreneurial opportunities. Also, higher educated individuals perceive more entrepreneurial opportunities	Network theory, human capital theory	Overall	Latent phase (opportunity recognition)	YES	NO
Rocha and Sternberg (2005)	Emp.	Regional level data from Germany, 2001-2003 (N=97)	Authors analyse the impact of clusters (defined as geographically proximate groups of interconnected firms) on entrepreneurship (defined as creation of new firms and associated institutions in related industries)	Clusters have an impact on entrepreneurship at the regional level, but industrial agglomerations do not.	Network theory, agglomeration theory, regional growth theory	Overall	Early-stage	YES	NO

<i>Authors</i>	<i>Type</i>	<i>Sample</i>	<i>Main objective</i>	Main results	Theoretical background	Types of entrepreneurship	Phases of entrepreneurship	Determinants	Link to growth
Wennekers et al. (2005)	Emp.	Country-level study: 36 countries, 2002	Authors assess the link between individuals' characteristics (and perceptions in particular) and new business creation	Nascent entrepreneurship is correlated with economic development and takes the form of a U-shape. The results suggest that a natural rate of entrepreneurship is contingent on the level of economic development	Schumpeter Mark I and II, structural transformation, stages of economic development	Opportunity/necessity	Nascent entrepreneurs	YES	NO
Van Stel et al. (2005)	Emp.	Country-level study: 36 countries, 2002	Authors investigate the impact of early-stage entrepreneurial activity on GDP growth and test whether this impact is contingent on the stage of economic development	Early-stage entrepreneurial activity is linked with economic growth, however particularly for countries that are in most advanced stage of economic development	Stages of economic development, managed vs. entrepreneurial economies	Overall	Early-stage	NO	YES
Acs and Varga (2005)	Emp.	Nine countries from the European Union in year 2002, seven years of observations (N=63)	Authors develop an empirical growth model that endogenizes entrepreneurial activity and agglomeration effects on knowledge spillovers	Entrepreneurial activity (several types considered) and agglomeration enhance technological change in the European Union	Endogenous theory of economic growth, new economic geography	High potential, necessity, opportunity	Early-stage	NO	YES
Davidsson (2005)	Special		Presentation of the 2004 International Award for Entrepreneurship and Small Business Research won by Paul Davidson Reynolds. The paper summarizes Reynolds' contributions to the field of entrepreneurship research.						
Reynolds (2005)	Special		Award acceptance speech by Paul D. Reynolds.						
Maula et al. (2005)	Emp.	Individual level data from Finland, 2000-2002 (N=6,007)	Authors investigate the propensity of individuals to make informal investments in new businesses owned by others.	Attitudes, experience, and skills matter more than the demographics in explaining the propensity to make informal investments. The predicted determinants explain better investments made into firms owned by other than close family members.	Social psychological theory of planned action, Economic theory on household portfolios	Informal investors		NO	NO

<i>Authors</i>	<i>Type</i>	<i>Sample</i>	<i>Main objective</i>	Main results	Theoretical background	Types of entrepreneurship	Phases of entrepreneurship	Determinants	Link to growth
Köllinger and Minniti (2006)	Emp.	Individual level data from USA, 2002 (N=4,900)	Study the variables related to observed differences in the rate of entrepreneurial involvement between different ethnic groups in USA (mainly black and white population)	Differences in subjective and often biased perceptions are highly associated with entrepreneurial propensity across these racial groups. Black people tend to exhibit more optimistic perceptions of their business environment and are more likely than others to attempt starting a business.	Human capital theory, Labour economists, social psychology and sociology	Overall	Early-stage and established	YES	NO
Acs and Szerb (2007)	Intro		Introduction special issue						
Acs et al. (2007)	Emp.	Individual level data for Hungary and Ireland, 2002-2004 (N=10,841)	Authors analyse the effect of FDI on indigenous entrepreneurship, comparing the long term developments of Ireland and Hungary	Entrepreneurial activity, entrepreneurial culture and entrepreneurs' characteristics differ significantly between the countries under study.	Internalization theory, knowledge spillovers	Overall, opportunity/necessity, sectors	Early-stage	NO	NO
Levie (2007)	Emp.	Individual level data from United Kingdom, 2003-2004 (N=38,046)	Author tests several hypotheses concerning the effect of migrant status and ethnicity on entrepreneurship (measured by new business activity).	Migration increases the probability of engaging in new business activity, while the effect of ethnicity is marginal. Being a recent ethnic minority migrant decreases the probability of engaging in new business activity. Migration flows appear to be important predictors of entrepreneurship at the regional level.	Occupational choice literature, migration theory	Overall	Early-stage	YES	NO
Van Stel et al. (2007)	Emp.	Country level data, 39 countries, 2002-2005 (N=112)	Authors examine the relationship between regulation and entrepreneurship using a two-equation model.	Minimum capital required to start businesses and labour market regulations reduce entrepreneurial activity, while administrative requirements are not related to new entrepreneurial activity.	Eclectic framework of entrepreneurship	Overall, opportunity/necessity	Nascent entrepreneurs, owner-managers in young firms	YES	NO
Ho and Wong (2007)	Emp.	Country level data, 2002 (N=37)	Authors examine the effect of finance availability and regulatory business costs on entrepreneurial propensity	Informal investments have a statistically significant influence on entrepreneurial propensity. Regulatory business costs are linked with owner opportunity-driven entrepreneurship.	Industrial organization, pecking order theory	Overall, opportunity/necessity, high growth potential	Early-stage	YES	NO

<i>Authors</i>	<i>Type</i>	<i>Sample</i>	<i>Main objective</i>	Main results	Theoretical background	Types of entrepreneurship	Phases of entrepreneurship	Determinants	Link to growth
Bergmann and Sternberg (2007)	Emp.	Individual level data from Germany, 2001, 2003, 2004 (N=16,478)	Authors analyse the determinants of start-up activity and the influence of entrepreneurship promotion policy in particular	Both individual and regional variables influence the decision to become an entrepreneur. Policy changes have affected the impact of unemployment on start-up propensity.	Labour economics, displacement theory	Overall, opportunity/necessity	Nascent entrepreneurship	YES	NO
Minniti and Nardone (2007)	Emp.	Individual level data from 37 countries, 2002 (N=59,304)	Authors aim to explain cross country gender differences in new business creation	Relationships between the likelihood of starting a business and demographic characteristics do not depend on gender if one controls for spurious effects.	Entrepreneurship, psychology and sociology	Overall	Nascent entrepreneurs	YES	NO
Tominc and Rebernik (2007)	Emp.	Individual level data (entrepreneurs) from Croatia, Hungary and Slovenia, 2002 (N=603)	Authors analyse the impact of cultural factors on growth aspirations of entrepreneurs.	Higher national degrees of perceived entrepreneurial opportunities are associated with higher growth aspirations.	Opportunity recognition, growth theory	Growth-expectation, market creation, technology	Early-stage	NO	NO
Szerb et al (2007)	Emp.	Individual level data from Croatia, Hungary and Slovenia, 2001-2004 (N=18,940)	Authors investigate factors driving informal investment in countries with low prevalence rates of informal investors.	Limited market economy experience is associated with own numbers of informal investors. Seven distinct groups of informal investors are identified.	Pecking order theory, finance gap literature, transition economies	Informal investors		YES	NO
Köllinger (2008)	Emp.	Individual level data 2002-2004 (N=9,549)	Author empirically examines the types and degrees of innovative rather than purely imitative business ventures	Entrepreneurial innovativeness depends both on individual factors and on the environment. High educational attainment, unemployment and a high degree of self-confidence are significantly associated with entrepreneurial innovativeness. Entrepreneurs in highly developed countries are significantly more likely to engage in innovative start-ups.	Opportunity recognition	Overall	Early-stage	YES	YES
Acs et al. (2008a)	Intro		Introduction to special issue		Stages of economic development, institutions				

<i>Authors</i>	<i>Type</i>	<i>Sample</i>	<i>Main objective</i>	Main results	Theoretical background	Types of entrepreneurship	Phases of entrepreneurship	Determinants	Link to growth
Levie and Autio (2008)	Conc./ Emp.	Country level data from 48 countries, 2000-2006 (N=224)	Authors provide a theory-grounded examination of the GEM model and empirically examine the relationship between entrepreneurial framework conditions and types of entrepreneurial activity	In high-income countries, opportunity perception mediates fully the relationship between (post secondary) entrepreneurship education and training in the country and its rate of (high potential) new business activity.	Opportunity recognition , creative destruction, productive entrepreneurship	Overall, high growth potential	Early-stage	YES	NO
Acs et al. (2008b)	Emp.	Country level data from 40 countries, 2004-2006 (N=90)	Authors compare entrepreneurship data from GEM and the World bank and interpret the differences	GEM data captures formal and informal business activity, while World bank data captures formal business activity based on national registrations		Overall	Nascent entrepreneurs, owner-managers in young firms	YES	NO
DeClercq et al. (2008)	Emp.	Country level data from 34 countries, 2002-2005 (N=80)	Authors explore if a country's proportion of export-oriented new firms represents an outcome of knowledge spillovers stemming from FDI and trade, as well as a source of knowledge spillovers.	Export-oriented entrepreneurship is influenced by FDI and international trade (contingent on phase of economic development) and functions as a catalyst for new business creation within the country.	Knowledge spillovers, absorptive capacity	overall, international-oriented	Early-stage	YES	NO
Acs and Amorós (2008)	Emp.	Country level data from 55 countries, 2001-2006 (N=207)	Authors investigate relationship between entrepreneurship dynamics in Latin-American countries and levels of competitiveness	Entrepreneurship dynamics decreased in Latin America between 2001-2006 but the countries followed different paths related to competitiveness. Achieving stable regulatory and macro-economic conditions is key for (further) economic development.	Stages of economic development, institutions	Overall, opportunity/necessity, job growth orientation, international orientation	Early-stage	YES	YES
Hessels et al. (2008)	Emp.	Country level data from 36 countries, 2005-2006 (N=63)	Authors examine drivers of entrepreneurial aspirations and motivations, as well as their interdependent relationship.	Countries with more entrepreneurs motivated by wealth accumulation have higher job growth and international oriented entrepreneurship. Social security is linked with lower values of ambitious entrepreneurship. Increase-wealth motives mediate the relationship between economic growth and entrepreneurial aspirations.	Institutional theory, entrepreneurial motivation	Innovation oriented, job growth oriented, international oriented	Early-stage	YES	NO

<i>Authors</i>	<i>Type</i>	<i>Sample</i>	<i>Main objective</i>	Main results	Theoretical background	Types of entrepreneurship	Phases of entrepreneurship	Determinants	Link to growth
Reynolds (2009)	Emp.	USA 134 independent samples of adult population, one from Wisconsin, the other 133 of the contiguous 48 US states and the DC. One sample= 750, others N=1,000.	Author compares changes and the potential impact of variations in wording in the initial screening items from surveys using US Panel Studies of Entrepreneurial Dynamics (PSED) and GEM.	Differences in wording of screening items can have a major effect on the prevalence of candidate nascent entrepreneurs. Adjustments for the number and wording of screening items change the estimated prevalence rate of candidate nascent entrepreneurs.		Overall	Nascent entrepreneurs	NO	NO
<i>Entrepreneurship Theory and Practice</i>									
Davidsson and Wiklund (2001)	Review	Authors reviewed 127 papers in three journals: JBV, ETT, JBV	Authors analyze levels of entrepreneurship researchers putting emphasis on the necessity of multi-level approach.	Is the first peer-review article that denote the GEM's research and its importance at national-level analysis related the EFCs					
Baughn et al. (2006)	Emp.	Country-level 2000-2008 (N=38)	Authors assess the relationship between normative support for women's entrepreneurship and the female/male ratio of entrepreneurs in different countries, using institutional theory. Uses multiple regression analyses.	Women may be more responsive than men to the level of normative support. Countries entrepreneurs are generally respected and admired, the proportion of female entrepreneurship is higher. Specific normative support for women's entrepreneurship is more critical immediate determinant of the female proportion a county's level of new firms.	Institutional theory	Overall/ Female-Male	Early-stage	YES	NO
Langowitz and Minniti (2007)	Emp.	Individual-level 2001 (N= 24,131)	Authors analyze a series of variables that influence the entrepreneurial propensity of women and investigate the correlation with differences across genders.	Perceiving opportunities, self-confidence and know other entrepreneurs are characteristics of entrepreneurs. Subjective perceptual variables have a crucial influence on the entrepreneurial propensity of women. Women perceive a less favourable environment and themselves compared with men.	Behavioural Economics	Overall/ Female-Male	Nascent entrepreneurs	YES	NO

<i>Authors</i>	<i>Type</i>	<i>Sample</i>	<i>Main objective</i>	Main results	Theoretical background	Types of entrepreneurship	Phases of entrepreneurship	Determinants	Link to growth
McMullen et al. (2008)	Emp.	Country-level 2002 (N= 37)	Authors analyze the relationship between Index of Economic Freedom (10 factors of Economic Freedom), GDP per capita and Opportunity (TEA-OPP) and Necessity-based entrepreneurial activity (TEA-NEC).	General support for the notion that entrepreneurial action increases eighth decreases in opportunity costs (GDP pc) and transaction cost (Economic Freedom). The later differs depending on the motivation: fiscal, monetary and labourfreedom are positive related with NEC. Property rights and labour freedom are positive associated with OPP.	Institutional theory	Overall, opportunity/necessity	Early-stage	YES	YES
<i>Journal of Business Venturing</i>									
Aidis et al. (2008)	Emp.	Individual level data from 2001-2005 (N=104,112)	Authors explore the relationship between the institutional environment, networks, and entrepreneurship development putting focus on Russia and compares with other transition economies and emergent markets.	Entrepreneurship development is lower in transitions economies and significant lower in Russia, but network effect are positive and significant in order to improve entrepreneurial activities in Russia.	Institutional theory	Overall and Informal investors	Early-stage	YES	YES
Anokhin and Schulze (2009)	Emp.	Country-level data 2000-2002 (N=33)	Authors analyze how corruption undermines the foundations of institutional trust that are needed for the development of trade and entrepreneurial and innovative activity.	Relationship between corruption and entrepreneurial activity is ambiguous but corruption and the quality of a nation's institutions play an important role in accounting for disparities in rates of entrepreneurship and innovation across nations. The study underscores that entrepreneurship and innovation do not occur in an institutional void.	Political economics, strategic management.	Overall	Early-stage	YES	YES
Kwon and Arenius (2010)	Emp.	Country-level data 2001-2003, (N= 36), individual level (N=289,308)	Authors measure how features of social capital at the country level explain cross-national variation in (1) entrepreneurial opportunity perception and (2) weak tie investment.	Individual-level attributes influenced opportunity perception and weak tie investment significantly. People share common personal attributes, regardless of their national context. After controlling for individual- and other country-level attributes, national social capital increased opportunity perception and weak tie investment.	Social capital theory, Kirznerian's opportunity perception,	Overall	Early-stage	YES	NO

<i>Authors</i>	<i>Type</i>	<i>Sample</i>	<i>Main objective</i>	Main results	Theoretical background	Types of entrepreneurship	Phases of entrepreneurship	Determinants	Link to growth
<i>Entrepreneurship and Regional Development</i>									
Verheul et al. (2006)	Emp.	Country-level 2002 (N= 29)	Authors measure the impact of several factors on female and male entrepreneurship at the country level. The main dependent variables are the number of female entrepreneurs and the share of women in the total number of entrepreneurs, using regression analyses to test 12 hypotheses.	Female and male entrepreneurial activity rates are influenced by the same factors and in the same direction. Some factors (e.g. unemployment, life satisfaction) have differential impact on female and male entrepreneurship. Women entrepreneurs are more active in the informal sector, especially in less developed countries. Implication for policy in order to promote women entrepreneurship.	Labour economists, determinants of entrepreneurship, gender theory.	Overall/ Female-Male	Early-stage	YES	NO
Vaillant and Lafuente (2007)	Emp.	Individual level data 2003, Spain (N=4.877)	Authors determinate the specific of entrepreneurial activity in rural areas putting focus on social fear of entrepreneurial failure and the presence of entrepreneurial role models. Subsample analyzes Catalonia.	Social stigma to entrepreneurial failure is an important constraint in Spain but not differences between rural and urban areas. Exceptional entrepreneurial performance of rural Catalonia influence a positive role model effect.	Institutional Economics Theory	Overall	Ealy-stage	YES	YES
Naudé et al. (2008)	Emp.	Individual level 2003 and 2004, South Africa (N= 3.314) regrouped on 93 country's regions.	Authors identify the determinants of start-up rates across different sub-national regions putting focus on the access to finance (banks) and other socio-economic indicators of the regions (population, regional profit, GVA, unemployment)	The number of bank branches in a district is significantly and positively associated with the start-up rate. The same with education levels. Unexpected result is that market-size (agglomerations) is negatively associated with start-up rates in South Africa; greater competition in a region will discourage the growth rate of new start-ups	Development Economics, endogenous growth.	Overall	Early-stage	YES	YES
<i>International Small Business Journal</i>									

<i>Authors</i>	<i>Type</i>	<i>Sample</i>	<i>Main objective</i>	Main results	Theoretical background	Types of entrepreneurship	Phases of entrepreneurship	Determinants	Link to growth
DeClercq and Arenius (2006)	Emp.	Individual-level 2002 GEM Belgium and Finland, (N=5,107)	Authors examine the effects of individual possession (existing) knowledge and exposure to external knowledge on the positively likelihood to engage business start-up activities.	Both, possession of knowledge and the differential exposure to external knowledge have an impact on the likelihood of business start-up activity. Special emphasis on specific skills for entrepreneurship and the role model from other entrepreneurs.	human capital, knowledge-based determinants of entrepreneurship	Overall	Nascent entrepreneurs	YES	NO
Arenius and Kovalainen (2006)	Emp.	Individual-level 2001 GEM Sweden, Norway, Denmark and Finland	Authors explore women's self-employment preferences across Scandinavian countries, and the influence and importance of societal and individual factors affecting self-employment preferences and their similarities and differences	Perception of self-employment skills arises across the countries as the most salient factor predicting self-employment preference. The multivariate models differ across the countries, thus challenging the existence of a universal Scandinavian model that explains the entrepreneurial activities of women.	social capital theory	Overall female	Nascent entrepreneurs	YES	NO
Roper and Scott (2009)	Emp.	Individual level data 2004 UK (N=22,000)	Authors analyze three hypotheses related that women are more likely to perceive financial barriers to start-up, those barriers will have negative impact on start-up, but for women the effect of these barriers will be weaker.	Women perceived greater financial barriers, this perceived barriers are also linked negatively to start up rates, but with this sample no evidence about significant effect on start-up among women and men. Training and work experience at college reduce perception of financial barriers.	Gender Theory	Overall female	Early stage	YES	NO
Thompson et al. (2009)	Emp.	Individual level data 2005-2006 UK (N=1,012) female business owners.	Analyze the differences and propensity to be a home-based entrepreneur controlling by income, education, motivation and number of employees.	There are disadvantages for women of using home as a base of a next business in terms of business growth and their subsequence survival.	Labour economics, labour choice	Overall female	Early stage	YES	NO

NOTES

ⁱAfter several alternatives were considered, the title Global Entrepreneurship Monitor, suggested by Erkkö Autio, was chosen as the most appropriate.

ⁱⁱEven though these ‘basic requirements’ are the most important drivers of economic growth for factor-driven economies, this does not mean that entrepreneurship is unimportant. Entrepreneurship can be a very relevant vehicle in improving basic requirements, such as education. For example, microfinance can stimulate entrepreneurship and is often accompanied by coaching. This can lead to benefits for society and entrepreneurs may be taught how to save money for education and training – for themselves and their children.

ⁱⁱⁱFor an explanation about these differences see Bosma et al., 2009 p. 12 “Main distinctions between GEM Adult population Survey Data and Business Registration Data”

^{iv}For GEM, the payment of any wages for more than three months to anybody, including the owners, is considered to be the “birth event” of actual businesses. The distinction between nascent entrepreneurs and new business owners depends on the age of the business. Businesses that have paid salaries and wages for more than three months and less than 42 months may be considered new.