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Types of Entrepreneurship and Economic Growth

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Abstract

In this paper, we empirically investigate the effect of entrepreneurship on economic growth at the country level. We use data from the Global Entrepreneurship Monitor, which provides comparative data on entrepreneurship from a wide range of countries. An important element of this paper is that we compare the effects of entrepreneurial activity on economic growth in high income, transition and low income countries. This dataset also enables us to make a distinction between the effects of entrepreneurship in general and growth-oriented entrepreneurship in particular. We present empirical tests of the impact of entrepreneurial activity on GDP growth over a four year period for a sample of 36 countries. Our empirical analyses suggest that entrepreneurship does not have an effect on economic growth in low income countries, in contrast to transition and high income countries where especially growth-oriented entrepreneurship seems to contribute strongly to macroeconomic growth.

Keywords: entrepreneurship, growth-oriented entrepreneurship, economic growth
JEL classification: L16, L26, M13, O11, O40, O57

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Abbreviations

FDI	Foreign direct investment
GCI	Growth competitiveness index
GDP	Gross domestic product
GEM	Global Entrepreneurship Monitor
IMF	International Monetary Fund
OL	Sordinary least squares
TEA	Total entrepreneurial activity
YB	Young business

Tables and figures appear at the end of the paper.

1 Introduction

Entrepreneurship has long been considered a crucial mechanism of economic development (Schumpeter 1934; Landes 1998). However, empirical studies on the role of entrepreneurship in economic growth show mixed evidence (Stam 2008). This is not remarkable because there is much heterogeneity in both the kinds of entrepreneurship and the kinds of economic contexts in which economic growth takes place. Until now studies have not sufficiently accounted for this heterogeneity on the micro and macro level, which limits our insight into the contingent role of entrepreneurship in economic growth. Important questions in this respect are: 'How does the role of entrepreneurship differ between high income, transition, and low income countries?', and 'What kinds of entrepreneurship are most crucial for economic growth?'. The objective of this paper is to provide insights into the role of different types of entrepreneurship in economic growth, and how this differs in poor and rich economies.

We empirically investigate the effect of entrepreneurship on economic growth at the country level. We use data from the Global Entrepreneurship Monitor (GEM), which provides comparative data on entrepreneurship from a wide range of countries. An important element of this paper is that we compare the effects of entrepreneurial activity on economic growth in high income, transition (China, Hungary, Poland, Russia, and Slovenia) and low income countries (Argentina, Brazil, Chile, India, Mexico, South Africa, and Thailand). This dataset also enables us to make a distinction between the effects of entrepreneurship in general and growth-oriented entrepreneurship in particular. We present empirical tests of the impact of entrepreneurial activity on GDP growth over a four year period for a sample of 36 countries.

Our empirical analyses suggest that entrepreneurship does not have an effect on economic growth in low income countries, in contrast to transition and high income countries where especially growth-oriented entrepreneurship seems to contribute strongly to macroeconomic growth. In the final section of the paper we summarize our empirical findings and discuss the potential implications for development policies.

2 Entrepreneurship and economic development

Development is a broad concept entailing the raising of human capabilities (Sen 1999). One of the central challenges in improving economic development is to increase the standards of living for individuals and growth of the economy as a whole. Even though economic growth in itself is a rather narrow target, it is probably one of the most important targets for development policies. It is also one of the measures that is most easy to access for analysts, and probably the best measure to make cross-national (Barro 1991; Sala-i-Martin 1997) and historical (Maddison 2001) analyses of the development of economies. Traditionally the economic output of a country is seen as a function of capital and labour inputs, combined with technical change (Solow 1957). Of course, conflicts and wars might interrupt this function (Sala-i-Martin 1997), but these are 'just' contingencies. The standard production function used, shows that economic output (Y) is a function of the sum of labour and capital inputs, and the level of technological knowledge (i.e. productivity). This means that economic growth—the growth of economic output—is a function of the growth of labour and capital inputs and technological progress. In traditional models of

economic growth investment in capital, labour and technology is sufficient to realize economic growth. New models of economic growth see these investments as a necessary complement to entrepreneurship/innovation, but not as a sufficient explanation for economic growth in its own right (Nelson and Pack 1999). One could even argue that high rates of investment in human and physical capital are themselves stimulated by effective innovation, and cannot be maintained in the absence of innovation. Recent studies emphasize entrepreneurship as a driver of economic development and some authors include entrepreneurship as a fourth production factor in the macroeconomic production function (Audretsch and Keilbach 2004). Entrepreneurship is the factor that creates wealth by combining existing production factors in new ways. Entrepreneurs experiment with new combinations of which the outcomes are uncertain, but in order to make progress, many new variations have to be tried in order to find out which ones will improve (economic) life (Rosenberg and Birdzell 1986). Other authors have argued that entrepreneurship will only unlock economic development if a proper institutional setting is in place (Baumol 1990; Powell 2008; Boettke and Coyne 2003). This institutional setting comprises informal as well as formal institutions (North 1990). An essential formal institution for welfare enhancing entrepreneurship is property rights. Insecure property rights have been an important constraint on the investments by entrepreneurs in transition countries, even more so than capital market constraints (Johnson et al. 2000). A specific example regarding property rights is the fact that until 1988 private firms with more than seven workers were not even allowed to operate legally in China (Dorn 2008: 301). It might be said that the production factors capital, labour, technology, and entrepreneurship are the proximate causes of economic development, while institutions are a fundamental cause of economic development (Acemoglu et al. 2004).
Next to productivity growth and technological change in established sectors, the development process in less advanced countries is largely about structural change (Nelson and Pack 1999; Rodrik 2007; Gries and Naudé 2008). A process in which an economy finds out—self-discovers—what it can be good at, out of the many products that already exist. The role of entrepreneurs in developing countries does not equal innovation and R&D commonly understood in advanced economies. Their role is to discover that a certain good, already well-established in world markets, can be produced at home at low cost (Rodrik 2007: 105; Hausmann and Rodrik 2003).[1] Examples of this are the entrepreneurs that figured out that Bangladesh was good in the production of T-shirts, Colombia in cut flowers, India in software services, and Taiwan in bicycles and display technologies. Even if entrepreneurs cannot appropriate all these gains for themselves, their discoveries generate large social gains for their economies. Spurring entrepreneurs to invest in their home economy is said to be one of the most important aspects of stimulating growth in poor countries (Rodrik 2007: 44–50). Investing refers here to innovation (e.g. employing new technology, producing new products, searching for new markets) and expanding capacity. These investments trigger the combination of capital investment and technological change.

In advanced capitalist economies, innovation and structural change take place through the combined efforts of small (independent inventors) and large innovative (organized R&D) firms, which complement each other in changing the economy (Nooteboom 1994; Baumol 2002). In developing countries the large firms are missing, and in transition countries there are large

[1] In fragile and failed states, entrepreneurship has another role in building up the private sector. From another starting point, the same counts for formerly communist countries.

organizations but these are largely in a process of restructuring and dismantling. This means that small firms will be the prime movers in the process of structural change in developing and transition economies.

We expect that the level of growth-oriented entrepreneurship in a country is a more relevant driver of economic growth than the mostly used indicators of entrepreneurship like the self-employment and new firm formation. In contrast to rich countries, entrepreneurship in low income countries is mainly driven by necessity (Bosma et al. 2008).[2] Most entrepreneurs in these economies do not start a firm because they desire independence or because they want to increase their income as compared to being an employee, which are the dominant motives in rich countries. Most new businesses in low income countries are started out of necessity, in contrast to high income countries, where entrepreneurship is most often opportunity driven. This is reflected in the finding that in poor countries self-employed are less happy than employees, while the reverse is true in high income countries (Blanchflower and Oswald 1998; Graham 2005). Entrepreneurs in low income countries most often start a business because they have no other way of earning a living. These entrepreneurs are not likely to be involved in a process of self-discovery; their actions are not likely to have an effect on the restructuring and diversification of the poor economies (Rodrik 2007).

3 Data and research method

It is generally acknowledged that there are differences in the distribution of entrepreneurship across countries. Studies exploring differences in entrepreneurship across countries often focus on the incidence of new firm registration or self-employment, which may not be reliable indicators when applied to transition and developing countries with significant informal economies and fewer alternatives to self-employment. For these reasons we have used the Young Business (YB) indicator, defined as the percentage of adult population that is the owner/manager of a business that is less than 42 months old (a *young business*). Many studies have used the total entrepreneurial activity (TEA) index, but that also includes the more speculative category of nascent entrepreneurs (individuals preparing a new business). In the current study we investigate whether the presence of growth-oriented entrepreneurs is a more important determinant of national economic growth than entrepreneurial activity in general. In the current paper we will perform regression analyses with next to the general YB index, the YB *high growth expectation* rate and the YB *medium growth expectation* rate as independent variables and compare their impact on economic growth with the impact of the general YB index. The data and model used in this study are described below.

We use a sample of 36 countries participating in the GEM in 2002. Data on six basic variables are used in our model: YB rate, YB medium growth, YB high growth, growth of GDP, per capita income, and the growth competitiveness index (GCI). The sources and definitions of these variables are listed below.

2 The only exceptions are Chile and Uruguay.

3.1 YB index

YB is defined as the percentage of adult population that is the owner/manager of a business that is less than 42 months old. The YB high (medium) growth expectation rate is defined as the percentage of adult population that is the owner/manager of a business that is less than 42 months old, *and expects to employ 20 (6) employees or more within five years* (YB6 and YB20). The YB medium growth rate reveals some similarity with the entrepreneurship indicator by Djankov et al. (2006), which includes owner-managers of a business with five or more employees. Data on the YB rate are taken from the GEM Adult Population Survey for 2002.

3.2 Growth of GDP (ΔGDP)

(Real) GDP growth rates are taken from the IMF World Economic Outlook database of the International Monetary Fund from September 2005. In equations (1) and (2) below variable ΔGDP_{it} refers to period 2002–05 (average annual growth) while the lagged GDP growth variable ($\Delta GDP_{i,t-1}$) refers to period 1998–2001.

3.3 Per capita income (GNIC)

Most studies on GDP growth include the initial level of income in their analysis and find it to be significant (the conditional convergence effect; cf. Abramovitz 1986). Gross national income per capita 2001 is expressed in (thousands of) purchasing power parities per US$, and these data are taken from the 2002 World Development Indicators database of the World Bank.

3.4 Growth Competitiveness Index (GCI)

In order to cover some aspects of the state of technology and institutions in a country (see section 2) we used the Growth Competitiveness Index for the year 2001 of the World Economic Forum (see McArthur and Sachs 2002). Given the low number of observations we are forced to use a combined index in our model. Even though there are huge problems in measuring technological capabilities and institutions (see Lall 2001), the composite GCI is probably the best combined index available that covers these two factors simultaneously.

We investigate whether (growth-oriented) entrepreneurship may be considered a determinant of economic growth, alongside the well-known determinants technology, public institutions, and the macroeconomic environment, which are captured by the GCI. As both entrepreneurship and the factors underlying the GCI are assumed to be structural characteristics of an economy, we do not want to explain short term economic growth but rather growth in the medium term. Therefore we choose average annual growth over a period of four years (2002–05) as the dependent variable in this study. Following Van Stel et al. (2005) we use (the log of) initial income level of countries, to correct for catch-up effects, and lagged growth of GDP, to correct for reversed causality effects, as additional control variables.[3]

[3] When the growth expectations for the national economy are good, more entrepreneurs may expect to grow their business in the years to come. Hence, there may also be a (reversed) effect of economic growth on (high expectation) entrepreneurship. To limit the potential impact of reversed causality we include lagged GDP growth as an additional explanatory variable. As this variable may influence both (high expectation) entrepreneurship and current GDP growth, omission might have led to a bias in the estimated effect of entrepreneurship on

We allow for the possibility of different effects for high income, transition, and low income countries. In addition we also test whether the effect of YB is different for transition countries.[4] YB rates may reflect different types of entrepreneurs in countries with different development levels, implying different impacts on growth. This is tested by defining separate YB variables for different groups of countries (high income, transition, and low income countries). Our model is represented by equations (1) and (2). These equations are estimated separately by OLS. The expectation that growth-oriented young businesses contribute more to national economic growth than young businesses in general corresponds to b_2 (c_2) being larger than b_1 (c_1). In these equations subscripts t and t-1 loosely indicate that the independent variables are measured prior to the dependent variable. The exact years and periods for which the variables are measured can be found in the variable description above.

$$\Delta GDPit = a + b1\ YBrichi,t-1 + c1\ YBtransitioni,t-1 + d1\ YBpoori,t-1 + e\ \log(GNICi,t-1) + f\ GCIi,t-1 + g\ \Delta GDPi,t-1 + \varepsilon it \quad (1)$$

$$\Delta GDPit = a + b2\ YB\_high\ growth\ richi,t-1 + c2\ YB\_high\ growth\ transitioni,t-1 + d2\ YB\_high\ growth\ poori,t-1 + e\ \log(GNICi,t-1) + f\ GCIi,t-1 + g\ \Delta GDPi,t-1 + \varepsilon it \quad (2)$$

To illustrate the data at hand, Table 1 provides the YB rates and the YB medium and high growth rates in 2002 as well as the average annual growth rates of GDP over the period 2002–05. From Table 1 and Figures 1 and 2 it can be seen that the ranking of countries in terms of YB or YB high growth may be quite different. For instance, while China ranks fifth in terms of YB, it ranks first in terms of high growth YB. In contrast, Thailand ranks third in terms of YB, but only tenth in terms of high growth YB.

When we regress the rate of GDP growth on the YB rate and the YB20 rate, the YB20 rate reveals to have a stronger correlation with GDP growth (see Figures 3 and 4). In Section 4 we will investigate more thoroughly whether YB and high growth YB affect national economic growth differently.

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economic growth. We also measure YB rates in a year (2002) preceding the period over which the dependent variable is measured (2002-05). By including lagged independent variables as well as a lagged dependent variable on the right-hand side, we basically measure the effects in a Granger-causality type of framework (Granger 1969). Still, the possibility of reversed effects cannot be ruled out completely.

4 The 36 countries in our sample are divided into three categories: rich, poor, and transition. The 24 rich countries are Australia, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, Korea, the Netherlands, New Zealand, Norway, Singapore, Spain, Sweden, Switzerland, Taiwan, the UK, and the USA. Our seven poor nations are Argentina, Brazil, Chile, India, Mexico, South Africa, and Thailand. The five transition countries are China, Hungary, Poland, Russia, and Slovenia. With the exception of Hungary and Slovenia, the transitional countries can be classified as (relatively) poor as well.

4 Entrepreneurship and national economic growth

4.1 Regression analyses

The results of our empirical exercises are in Table 2. Model I presents the regression results of the impact of the general YB index (see equation 1), while Models II and III show the results using the YB6 and YB20 rates as main independent variables (see equation 2).

The results presented in Table 2 show that the impact of entrepreneurial activity is significantly positive for rich countries, but effectively zero for poor countries.

The presence of growth-oriented entrepreneurs seems to be more important for achieving GDP growth than general entrepreneurship. Comparing the coefficients of the various YB rates, we see that the impact of YB6 is greater when compared to the impact of YB in general. Meanwhile the impact of YB20 is even greater, but not always statistically significant.

Having more growth-oriented entrepreneurs seems to be particularly important in transition countries. Both the magnitude and the statistical significance of the estimated coefficient point at a stronger impact compared to rich or poor countries. There are many reasons that could explain the importance of growth-oriented entrepreneurs in transition countries (Smallbone and Welter 2006). First, there are many entrepreneurial opportunities in formerly state-dominated sectors. Second, many highly qualified individuals lost their jobs at state-financed organizations (e.g. universities, enterprises, government services). Third, there are many highly qualified (potential) entrepreneurs in these countries (especially in Eastern European countries), who do not face the opportunity costs of working for large public or private organizations. Fourth, those highly qualified (potential) entrepreneurs are also well connected to the power networks that were, and to a large extent still are important in the political and economic arena of these countries, which takes away some barriers for high growth firms in these countries. Summarizing, it may be argued that in transition economies high growth opportunities are more widely available and hence, a higher number of growth-oriented entrepreneurs are willing to act on these opportunities may be particularly fruitful for achieving growth in these countries. However, we should be aware of the large diversity in the group of transition countries, which comprises countries like Russia and China, as well as Hungary and Slovenia. We will take a closer look on a few low income and transition countries in the next sections.

Our regression results should be interpreted with care as the analysis is based on a limited number of observations (36 countries). As a test of robustness we estimated the models leaving out one country at a time, i.e. we computed 36 auxiliary regressions, where each regression uses 35 observations (each time leaving one of the 36 countries out). Although t-values sometimes dropped a little, coefficients and t-values were generally in line with those reported in Table 2. The country that matters the most for the results obtained in Table 2 is China. This is not surprising as China combines high YB/YB6/YB20 rates with high GDP growth rates (see Table 1). When leaving this country out of the sample, the coefficient (t-value) for the transition countries is 0.32 (0.5) for the YB rate, 1.47 (1.2) for the YB6 rate, and 1.72 (1.1) for the YB20 rate. The low t-values are in part due to the low number of observations. Note however that the coefficients are very similar to the full sample estimates reported in Table 2. Furthermore, the Jarque–Bera test on the normality of disturbances is passed for all models reported in Table 2,

indicating that it is not necessary to remove individual country observations. Therefore we feel that our results are quite robust to the potential influence of outliers. Nevertheless, given the low number of observations, the results should only be seen as a first illustration of how the impact of different types of entrepreneurship may differ between groups of countries with different levels of development.

4.2 Low income countries

Within the groups of transition and developing economies there are substantial differences in entrepreneurship rates. Chile stands out because of a particularly high rate of growth-oriented entrepreneurship, while Mexico has a particularly low rate of growth-oriented entrepreneurship. In contrast to rich countries, entrepreneurship in developing economies is mainly driven by necessity: self-employment is often the only occupational choice given a paucity of other sources of employment (necessity-based entrepreneurship; see: Acs and Amoros 2008; Bosma et al. 2008). The actions of most of the entrepreneurs in low income countries are not likely to have an effect on the restructuring and diversification of the poor economies. This would be the whole story if the rates of growth-oriented entrepreneurship would also be marginal in these economies. This is only the case for Mexico. Next to Chile—where opportunity-driven entrepreneurship is dominant—Brazil, India, and Argentina perform quite well with respect to growth-oriented entrepreneurship. This means that there still is a substantial group of entrepreneurs in low income countries that might get involved in a process of self-discovery. The problem in practice is that in contrast to rich and transition economies, growth-oriented entrepreneurship is less likely to be realized in developing economies, due to constraints on the provision of capital and (skilled) labour.

An additional constraint in low income countries is that there is generally a lack of (foreign) larger companies, which could act as a training ground for prospective growth-oriented entrepreneurs, and could open up distributions channels for new fledgling enterprises (Knorringa 1996). One should make a distinction between productive (manufacturing) and resource extractive (mining, oil) activities here, as the former will be a more useful for the development of entrepreneurship than the latter.

4.3 Transition countries

New firms in transition countries not only displace obsolete incumbents but also fill in new markets, which were either non-existent or poorly populated in the past. Our study suggests that in transition countries, growth-oriented entrepreneurs make an important contribution to economic growth. They create new jobs with relatively high incomes which the small incumbent population of private firms cannot provide. This entrepreneurial growth process is facilitated by the relatively high levels of human capital in combination with relatively low opportunity costs of self-employment of the adult population. The high degree of environmental dynamism in these countries—which is likely to positively affect the level of growth expectations and realizations of entrepreneurs in these countries—requires ambitious and well-connected entrepreneurs in order to translate these abundant opportunities in economic growth.

There are considerable differences within the group of transition countries. Hsu (2005) shows that the role of these connections differs considerably between China and Russia: in China it was

a tool which could be used to build enough trust to allow business transactions to succeed ('capitalism without contracts'). In contrast, in Russia these connections devolved into corruption, and faded in importance for ordinary citizens. Without a way to build trust or extend networks, Russians retreated into defensive involution, and engaged in predatory behaviour against those outside their small circles of friends. Instead of capitalism without contracts, Russia suffered the depredations of 'capitalists without capitalism'.

There are also substantial differences in entrepreneurship rates within the groups of transition economies. China stands out because of particularly high rates of growth-oriented entrepreneurship (cf. Hsu 2005). Even though the YB rate is below the average of transition countries, the growth of self-employment has been enormous, not only in the richer coastal provinces, but also in rural areas (Mohapatra et al. 2007). Research by Djankov et al. (2006) also showed that entrepreneurs in China are more risk-taking and more committed to an entrepreneurial career than entrepreneurs in Russia. In addition, Russia has (and had: see Hsu 2005) a particularly low rate of entrepreneurship in general as well. The striking difference between entrepreneurship rates in China and Russia can be explained by their different paths from socialism to capitalism: gradualism and a shock therapy (see Burawoy 1996).

In China the gradual transformation started with a policy of decollectivization (decentralization of property relations) in the late 1970s and the promotion of smallscale industry, with a focus on promoting independent entrepreneurship. Experimentation with new economic arrangements, for example privatization of small state-owned enterprises, has led to a favourable accumulation of productive capabilities in China. In contrast, Russia underwent a shock therapy in which the old communist regime was liquidated, with a focus on rapid privatization of the state sector.

However, the Russian state failed to organize a market economy, which led to a coordination and entrepreneurial vacuum into which have stepped conglomerates, banks and mafia, siphoning off surplus from production to exchange (Burawoy 1996).

5 Discussion of policy implications

In this section we will shortly discuss the potential implications of our exploration of the relationship between types of entrepreneurship and economic growth for entrepreneurship policy and industrial/cluster policy in low income and transition countries.[5]

5.1 Entrepreneurship policy

Our empirical analyses suggest that entrepreneurship does not have an effect on economic growth in low income countries, in contrast to transition and high income countries where both growth-oriented entrepreneurship and entrepreneurship in general seem to contribute strongly to macroeconomic growth. Does this mean that stimulating entrepreneurship in low income countries is bad policy? The least we can say is that stimulating entrepreneurship alone will be insufficient as it is likely to attract necessity entrepreneurs with low human capital levels who do not contribute to economic growth. The non-significant effect of entrepreneurship on economic

5 For a review of public policies for high-growth start ups in high income countries see Stam et al. (2007).

growth in low income countries might point at a lack of large firms in these countries. By exploitation of economies of scale and scope and by adopting and diffusing technology developed elsewhere, large firms are important in transforming a developing economy into a developed economy (Van Stel et al. 2005). In these economies local workers are more productive working as a wage-employee compared to working as an (often marginal) entrepreneur. Nevertheless stimulating growth-oriented entrepreneurship might be an additional element of transforming a developing economy into a developed one. Attracting investments by large (possibly foreign) firms, stimulating growth-oriented entrepreneurship, investing in labour and capital and improving the institutional framework may be the recipe for growth here. On the one hand this is old news, in that it provides a plea for the traditional role of governments to invest in education and physical infrastructure, and to build and maintain a set of institutions that enable the development of the private sector (cf. Rosenberg and Birdzell 1986). On the other hand, the addition of growth-oriented entrepreneurship in development policy for low income and transition countries is a new element. One must be careful to target the right group of entrepreneurs though, i.e. governments should avoid that resources made available through government stimulation programmes are absorbed by necessity entrepreneurs with low human capital levels.

5.2 Industrial/cluster policy

The focus of this paper has been on the country level, which aggregates away the subnational level of analysis, and what is of particular relevance here, the level of regional clusters (regional concentrations of particular industries). These regional clusters have been proven to be important drivers of economic development in for example Taiwan, India, and Brazil. These clusters are both driven by and drive growth-oriented entrepreneurship. Growth-oriented entrepreneurs that start to invest in a particular industry are needed in order to reach a critical mass that is needed to reach certain agglomeration economies (Braunerhjelm and Feldman 2006). If the build-up of capacity to this level of critical mass is not reached due to the lack of complementary investments, there might be a role to play for governments to overcome coordination failure, for example by providing investment guarantees for entrepreneurs (see Rodrik 2007). Such industrial policy is not about ‘picking winners’ or comprehensive planning, but encouraging experiments with new types of economic activity (Rodrik 2007); since it is impossible to judge winners and losers in advance, competent and growth-oriented entrepreneurs should be encouraged to try, success rewarded and failure not coddled (Nelson and Pack 1999).
These clusters do not have to be close to the technology frontier (as in advanced capitalist economies). The real policy implications arise from thinking carefully about the particular sources of advantage for a nascent cluster and why that source might yield short term complements with the potential to become long term substitutes (Bresnahan et al. 2001). Cooperation of clusters in developing countries with existing richer economies is not ‘colonialist’. Take for example the linkages with the USA. India and Taiwan are linked to the USA (especially Silicon Valley) via outsourcing of software services and manufacturing (due to low labour costs), but also by a returning group of expatriates who have worked there, and who see the benefits of long distance collaboration (Saxenian 1999). There is a flow of people—the so-called Argonauts (Saxenian 2006)—and ideas back and forth between rich and emerging economies. Migrant workers tend to be among the most entrepreneurial in society. Governments of developing countries should not only look at these expatriate workers as a source of remittances. Given their entrepreneurialism, skills and exposure to business in the developed

world, as well as the desire of many of them to return home, they may be very important as a source of self-discovery in their country of origin (Rodrik 2007: 118–19). In addition to developing the private sector, these return migrants may provide the new elite needed for building up a civil society. Only a fraction of the money spent on attracting FDIs would be needed to target nationals abroad. This would attract more knowledgeable human capital and durable investments than most FDIs will do. Once critical mass is reached within a regional cluster, it is likely to generate or attract growth-oriented entrepreneurs (e.g. Argonauts), which on their turn stimulate further macroeconomic growth.

5.3 Limitations and further research

The regression analyses in this paper are of limited value: they have not only simplified the range and (linear) effects of determinants for economic development, they have also dumbed down economic development to economic growth over a short term (four- year) period. We know that sustaining growth is more difficult (and caused by different factors) than igniting it (Rodrik 2007). This also connects to one of the other shortcomings: sustaining growth probably requires much more extensive institutional reform than can be properly taken into account in linear regression analyses. Next to better measures of institutions, future research should take into account samples with a larger number of low income and transition countries, and multiple years in order to achieve more robust empirical analyses. In addition, our data did not allow for testing the multiplicative effect of entrepreneurship, so we only analysed the additive effect. A larger number of cases would enable the inclusion of the more traditional indicators of capital and labour in the analyses, and allow for testing the multiplicative effect.

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Table 1: YB rates (2002) and GDP growth rates for 36 countries

	YB rate	YB medium growth rate (6+)	YB high growth rate (20+)	Average GDP growth rate 2002–05 (%)
United States	4.57	2.12	1.24	3.00
Russia	1.54	1.23	1.05	6.18
South Africa	2.00	0.88	0.58	3.60
Netherlands	2.09	0.90	0.63	0.60
Belgium	1.08	0.29	0.25	1.53
France	0.86	0.29	0.22	1.43
Spain	2.54	1.06	0.41	2.98
Hungary	3.62	1.29	0.98	3.50
Italy	2.35	1.14	0.84	0.48
Switzerland	3.26	1.28	0.38	0.60
United Kingdom	3.05	1.25	0.74	2.40
Denmark	3.12	1.43	0.58	1.45
Sweden	2.51	0.82	0.47	2.43
Norway	4.40	1.29	0.75	1.88
Poland	0.77	0.49	0.49	3.40
Germany	2.07	1.12	0.83	0.58
Mexico	3.22	0.81	0.32	2.40
Argentina	6.20	1.70	1.46	3.60
Brazil	8.46	3.17	2.34	2.65
Chile	5.49	3.83	2.23	4.48
Australia	5.22	2.10	1.25	3.18
New Zealand	6.06	2.50	1.50	3.85
Singapore	2.03	1.23	0.53	4.23
Thailand	8.40	2.52	1.37	5.45
Japan	1.04	0.52	0.26	1.45
Korea	9.29	3.95	2.43	4.63
China	7.41	2.83	2.57	9.08
India	7.45	2.68	2.15	6.63
Canada	3.58	1.51	0.91	2.73
Ireland	4.20	1.90	0.92	5.00
Iceland	6.23	2.79	1.98	3.28
Finland	2.06	0.71	0.43	2.50
Slovenia	1.53	0.71	0.41	3.58
Hong Kong	1.40	0.56	0.14	4.88
Taiwan	3.08	1.72	1.15	4.08
Israel	3.88	2.81	1.94	2.28
Mean	*3.78*	*1.60*	*1.02*	*3.22*

Sources:GEM and IMF.

Table 2: Regression models average annual growth of GDP over the period 2002–05 (N=36)

	Dependent variable: average annual growth of GDP over the period 2002–05		
	Model I: YB	Model II: YB6	Model III: YB20
Constant	21.3 *** (2.8)	19.5 *** (3.7)	18.9 ** (2.7)
Entrepreneurship in rich countries†	0.20 ** (2.6)	0.46 ** (2.4)	0.48 (1.3)
Entrepreneurship in transition countries	0.36 ** (2.1)	1.24 *** (3.2)	1.29 ** (2.5)
Entrepreneurship in poor countries	0.053 (0.3)	0.24 (0.8)	0.29 (0.5)
Log (GNIC)	-2.3 ** (2.5)	-2.2 *** (2.9)	-2.2 ** (2.4)
GCI	0.59 (0.7)	0.80 (1.1)	0.86 (1.1)
Lagged GDP growth	0.22 (1.1)	0.18 (0.9)	0.21 (1.0)
R^2	0.672	0.693	0.676
Jarque Bera statistic [p-value]	[0.259]	[0.278]	[0.427]

Notes: Absolute heteroskedasticity consistent t-values are between brackets.
* Significant at a 0.10 level; ** 0.05 level; *** 0.01 level.
† interaction rich country dummy with either YB, YB6, or YB20.

Figure 1: Levels of YB rate

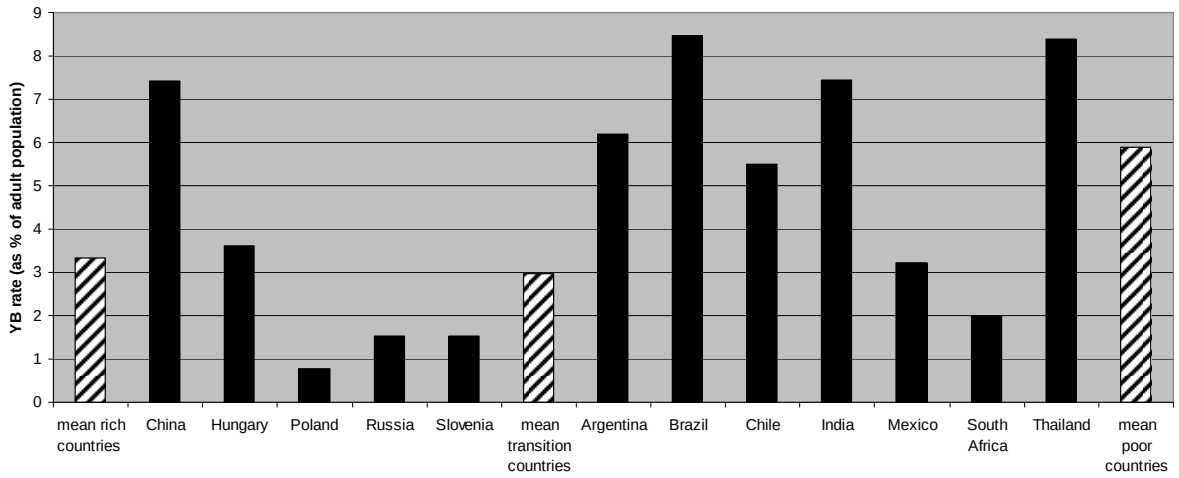


Figure 2: Levels of YB20 rate

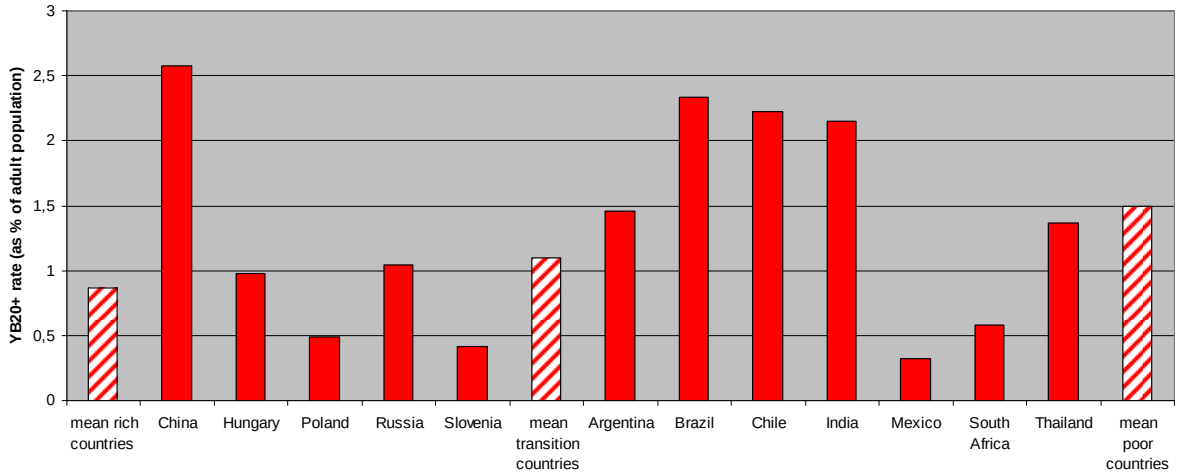


Figure 3: Correlation YB rates and GDP growth rates

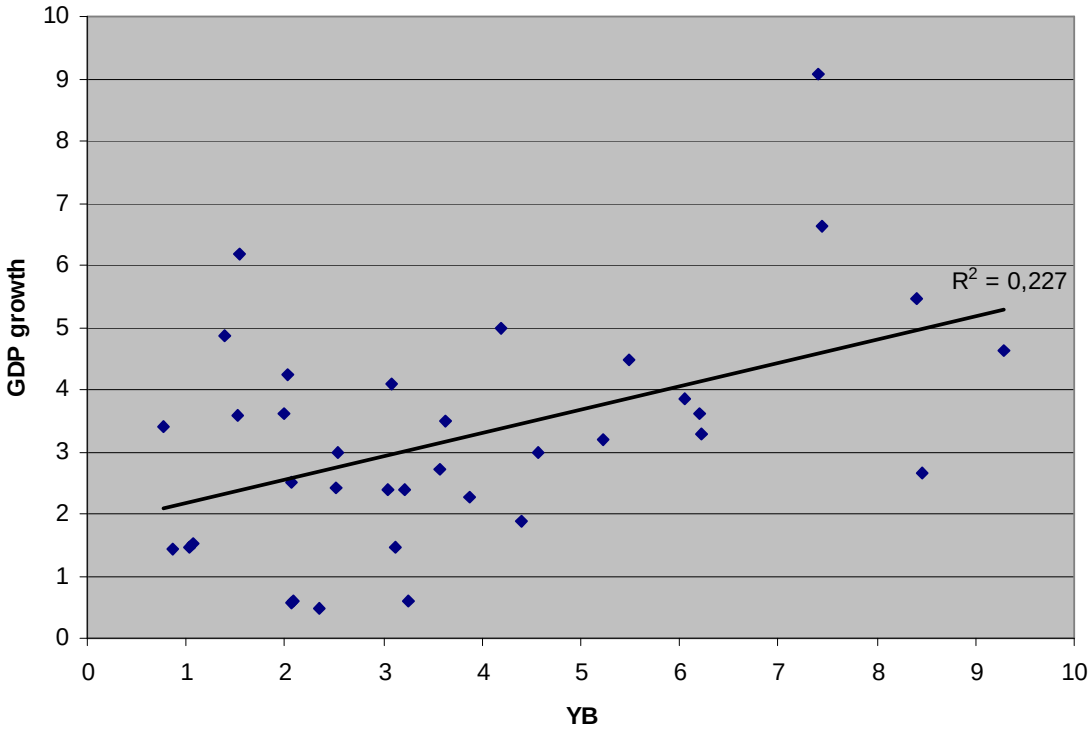
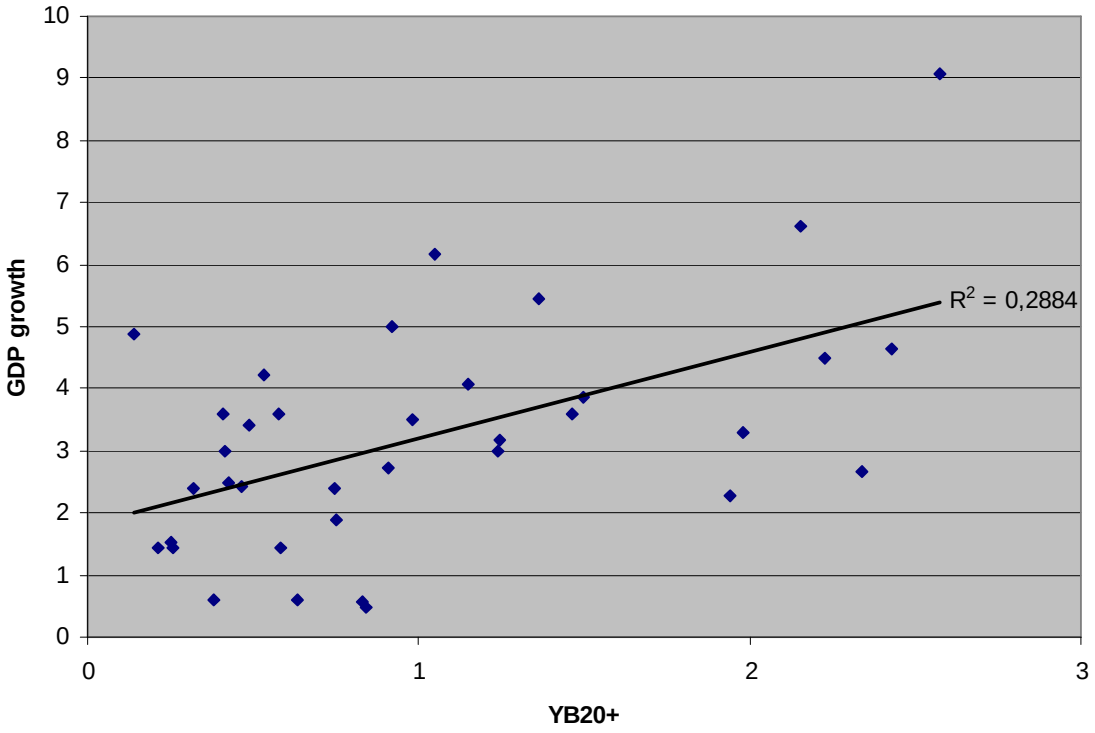


Figure 4: Correlation high growth-oriented YB rates (20+) and GDP growth rates



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