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**Working Paper**

## Entrepreneurship and reforms in developing countries

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Research Paper No. 2009/04

## **Entrepreneurship and Reforms in Developing Countries**

Mina Balamoune-Lutz\*

February 2009

### **Abstract**

We examine how institutional and policy reforms affect the relationship between entrepreneurship and growth. We perform Arellano-Bond GMM estimations on annual data (over the period 1990-2002) from a large group of developing countries and focus in particular on the interplay between policy and institutional reforms and entrepreneurship. We find that the joint effect of trade reform and entrepreneurship on growth is negative, suggesting that trade reform diminishes the positive effects of entrepreneurial ability on growth, while the joint effect of financial sector reform and entrepreneurship has a non-linear impact on growth. Financial sector reforms enhance the growth effect of entrepreneurship at initial levels and diminish it at high levels of reform. In addition, we find that the interplay of institutional reform and entrepreneurship does not seem to matter for the growth effects of entrepreneurship.

Keywords: growth, entrepreneurship, institutions, policy reform

JEL classification: E6, O1, O4

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## 1 Introduction

The economic literature includes many studies that have demonstrated either theoretically or empirically the positive effects of entrepreneurship on growth and development. The importance of the role of entrepreneurship in less developed economies was often highlighted in the literature on economic development in the postwar period (see for example, Harbison 1956; Papanek 1962; Baumol 1968; and Leibenstein 1968). Indeed, Baumol (1968: 66) contends that:

if we seek to explain the success of those economies which have managed to grow significantly with those that have remained relatively stagnant, we find it difficult to do so without taking into consideration differences in the availability of entrepreneurial talent and in the motivational mechanism which drives them.

A number of recent studies have focused on the role of institutional and policy reform on growth and development (see, for example, Acemoglu, Johnson and Robinson 2001, 2002; Acemoglu et al. 2003; Rodrik, Subramanian and Trebbi 2004; Balamoune-Lutz and Ndikumana 2007; and Balamoune-Lutz 2009). Since institutional and policy reforms are expected to affect investment decisions and occupational choice, we would expect them to have an impact on entrepreneurship. Institutional reform that affects taxes or liquidity constraints, for example, would have an impact on entrepreneurial activity (Gentry and Hubbard 2000; Guiso and Schivardi 2007; Djankov et al. 2008). Thus, one channel through which institutional and policy reforms would affect growth could be through their interplay with entrepreneurial activities. Similarly, a possible channel for the effect of entrepreneurship on growth could be its interaction with institutional and policy reforms. Intuitively, we may think that an improvement in trade and financial environments (policy reform) and/or enhanced institutional quality would lead to more entrepreneurial activities, *ceteris paribus*. It turns out that both theoretically and empirically this may not necessarily be the case.

The primary goal of this paper is to explore how institutional and policy reforms affect the relationship between entrepreneurship and growth. We do so by performing Arellano-Bond GMM estimations on annual data from a group of developing (and transition) countries, covering the period 1990-2002. Our analysis focuses in particular on the interplay between policy and institutional reforms and entrepreneurship (defined in this paper as the ratio of self-employed to total non-agricultural employment, in per cent). Estimation results indicate that the interplay of entrepreneurship, and trade and financial sector reforms is important. The empirical results indicate that the joint effect of trade reform and entrepreneurship on growth is negative, suggesting that trade reform reduces the positive effects of entrepreneurial ability, while the joint effect of financial sector reform and entrepreneurship has a non-linear effect on growth. Financial sector reform enhances the growth effects of entrepreneurship within a medium-level range and reduces it at high levels of reform. Moreover, we find that the interplay of institutions and entrepreneurship does not seem to matter for the growth effects of entrepreneurship. The negative relationships between policy (trade and financial sector) reforms and entrepreneurship seem to validate the prediction of the Iyigun-Rodrik theoretical model that institutional reform works best in settings where entrepreneurial activity is weak while policy tinkering works best when entrepreneurial activity is

vibrant<sup>1</sup> (Iyigun and Rodrik 2005) and are consistent with the findings reported in Balamoune-Lutz (2007).

If we assume that a significant change in a country's openness to trade or in its ratio of credit to the private sector results from policy reform (viewed by Iyigun and Rodrik as institutional reform) instead of policy tinkering, then we may use indicators of trade openness and financial development as proxies for policy reform. In this paper, we consider changes in taxation or money supply, or marginal changes in the structure of tariffs—that do not necessarily lead to significant changes in access to credit or trade openness—as policy tinkering. In this paper, we do not test for the effect of policy tinkering, as the indicators we use are viewed as proxies for policy and institutional reform, not policy tinkering. However, while in their empirical estimation, Iyigun and Rodrik (2005) test for the effect of the interplay of entrepreneurship and trade reform only, we test for the interplay of entrepreneurship with institutional, trade, and financial sector reforms. This allows us to try to identify which interactions matter for the growth effects of entrepreneurship.

The remainder of the paper proceeds as follows. Section 2 provides a brief review of the literature on the role of reforms and entrepreneurship in growth and development. Section 3 describes the data and methodology. Section 4 discusses the estimation results. Section 5 concludes.

## **2 Reforms, entrepreneurship, and economic outcomes**

In this section, we briefly review recent empirical research on the role of entrepreneurship, and institutional and policy reforms in growth and development. In examining the role of policy reform we focus on financial sector and trade policy reforms primarily because they have been at the forefront of reform programmes implemented by developing economies. We also discuss the relevance of the interplay of reforms and entrepreneurial activity.

Financial sector reforms are often implemented with the assumption that such reforms would lead to financial development, which in turn would promote growth and development. Recent empirical research on financial development and growth includes, among others, Demetriades and Hussein (1996), Beck, Levine and Loayza (2000), Benhabib and Spiegel (2000), Levine, Loayza and Beck (2000) and Shan (2005). Many empirical studies document that financial development causes growth. However, several others show that the evidence is either nonexistent or weak, or that there is reverse causality (see, for example, Demetriades and Hussein 1996; Thornton 1996; Balamoune-Lutz 2003; Shan 2005).

Similarly, the topic of the growth effects of trade liberalization and reform has been examined in a number of empirical studies (Sachs et al. 1995; Edwards 1993, 1998; Krueger 1998; Rodriguez and Rodrik 2000; Dollar and Kraay 2004; Rodrik, Subramanian and Trebbi 2004; Balamoune 2002; Balamoune-Lutz and Ndikumana

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<sup>1</sup> See Iyigun and Rodrik (2005) about the distinction between institutional reform and policy tinkering. Also, see the comments about the definition of policy and institutional reforms in Balamoune-Lutz (2007).

2007). While some studies show that trade reforms have a positive impact on growth (see for example, Sachs et al. 1995; Sachs and Warner 1997; and Dollar and Kraay 2004), recent empirical studies (for example, Mukhopadhyay 1999; Rodriguez and Rodrik 2000; and Balamoune-Lutz and Ndikumana 2007) show that the growth effects of trade reforms may be non-existent, not systematic (Rodrik 2001), or negative. There is also empirical evidence that the effects may be contingent on pre-existing institutional settings (Addison and Balamoune-Lutz 2006; Balamoune-Lutz and Ndikumana 2007).

The role of institutions in development and growth has also been the subject of numerous studies (North 1990 and 1991; Knack and Keefer 1995; Acemoglu et al. 2003; Easterly and Levine 2003; Dollar and Kraay 2003; Rodrik, Subramanian and Trebbi 2004; Balamoune-Lutz and Ndikumana 2007). For example, Acemoglu et al. (2003) argue that institutions have a significant effect on economic outcomes and on macroeconomic policies. Easterly and Levine (2003) show that institutions are the only channel through which tropics, germs, and crops influence development. Similarly, Rodrik, Subramanian and Trebbi (2004) conclude that there is empirical evidence of the primacy of institutions over trade and geography.

Balamoune-Lutz (2007) notes: ‘entrepreneurship affects development through the process of innovation, investment, and market expansion’. Leff (1979) writes, ‘entrepreneurship clearly refers to the capacity for innovation, investment, and activist expansion in new markets, products, and techniques’. Baumol (1968) argues that it is the entrepreneur’s job to find new ideas and put them to use. Indeed, the literature on entrepreneurship often stresses ‘Schumpeterian entrepreneurship’ and focuses on innovation as the main activity of the entrepreneur. Since innovation tends to require access to new technology and/or new ideas, such access can be greatly influenced by institutional and policy reforms.

Banerjee and Newman (1993) develop a theoretical model where capital markets are imperfect—so that wealthy individuals can become entrepreneurs while poor individuals are constrained to work for a wage—and show that the dynamics of occupational choice can influence the process of development through their effect on the distribution of income and wealth. Thus, institutional and financial sector reforms that would alter capital market imperfections could alter the growth effect of entrepreneurship. Moreover, Balamoune-Lutz (2007) argues that the decision to allocate talent or entrepreneurial ability to productive rather than to unproductive activities<sup>2</sup> could depend on the relative rewards offered by society and:

since such rewards are usually governed by pre-existing policies and institutional settings we would expect a significant interaction between the allocation of entrepreneurship to productive (or unproductive) activities and policy and institutional reforms.

Thus, here again the interplay of reforms and entrepreneurship may influence the growth-effects of entrepreneurship.

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<sup>2</sup> Baumol (1990), and Colombatto and Melnik (2005) provide insightful discussions of the importance of the distinction between productive and unproductive entrepreneurship.

The interplay of reforms and entrepreneurship is examined in the model developed in Iyigun and Rodrik (2005). The authors assume that investment decisions and policy outcomes are subject to uncertainty and use a theoretical model to study the interplay of institutional and policy reform and entrepreneurship, and its impact on growth. Their findings indicate that the impact of institutional reform depends on the level of entrepreneurial activity. More specifically, Iyigun and Rodrik show that institutional reform has negative growth effects when entrepreneurial activity is strong and positive effects when entrepreneurial activity is weak. This is because reforms could impose a cost on the existing entrepreneurs while it may be neutral or even helpful to new ventures.<sup>3</sup>

Using a theoretical model where contractual problems between two entrepreneurs (partners) may arise, Acemoglu and Verdier (1998) show that less developed countries may find it optimal to maintain low property rights and a certain level of corruption. This is because enforcing property rights can be costly. The authors argue that since it is costly to reduce corruption and enforce property rights, the optimal allocation may also depend on the productivity of entrepreneurial activities. Thus, as Acemoglu and Verdier (1998: 1382) argue: ‘could be optimal for less developed economies, which may have less productive investment opportunities, to have a lower level of property right enforcement and more corruption’. Higher public wages can also be part of institutional reform, through their effects on the quality of bureaucracy and the level of corruption. The authors show that an increase in public wages can at the same time enhance the allocation of talent and cause entrepreneurial investment to increase. Acemoglu and Verdier (1998: 1383) conclude that:

marginal improvement in the enforcement of property rights secured by higher bureaucratic wages may make it worthwhile for entrepreneurs to invest, increasing the expected return to entrepreneurship. Higher entrepreneurial returns, in turn, induce more agents to choose this occupation rather than public employment.

On the other hand, if a country maintains weak institutions, which would cause for example weak property rights, then this may induce individuals from the present generation to invest less in human capital and would not be able to benefit from improved institutional quality once it takes place and thus may vote against institutional reform (Acemoglu and Verdier 1998). In this case, some countries may persistently have low institutional quality and low investment. This, in turn, may suggest that in such countries, a large part of the self-employment will take place in the informal sector (remedial or subsistence entrepreneurial activity) where the level of human capital is generally low.

### **3 Data and methodology**

The dependent variable is defined as the rate of growth in per capita income. We follow Iyigun and Rodrik (2005) and Balamoune-Lutz (2007) and define the variable

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<sup>3</sup> Iyigun and Rodrik (2005) take the view that only institutional reforms could have such effect. In this paper we assume that a significant policy change (for example, greater trade liberalization) could produce similar effects in developing and transition economies.

entrepreneurial intensity (ENT) as the ratio of self-employed to total non-agricultural employment<sup>4</sup> (data are from LABORSTA dataset, ILO). The proxy for trade reforms (OPEN) is openness to international trade, measured by the ratio of the sum of imports and exports to GDP, in per cent. In this paper, financial sector reform is proxied by domestic credit to the private sector (the variable CREDIT) as a percentage of GDP.<sup>5</sup> Our proxy for institutional reform (the variable ICRG) is the International Country Risk Guide composite index.<sup>6</sup> ICRG ratings are published by the Political Risk Services (PRS) Group and include economic, political, and financial risk. These three categories of risk include scores for 22 risk components. The ICRG composite index is from *World Development Indicators* database. The index has values ranging from zero (highest risk) to 100 (lowest risk). Data, except for data on the variable ENT, are from the World Bank *World Development Indicators* database.

We initially include 44 developing and transition economies. We then try to test the robustness of our results by excluding countries that used to be in the group of developing countries but are currently included in the high-income (developed countries) group, such as Singapore and South Korea for example, and excluding Sub-Saharan African countries. The choice of the countries is dictated by data availability. The choice of the period (1990-2002) is dictated by the need to minimize cross-country disparity in the number of observations per country, since many developing countries do not have data on ENT prior to the 1990s, and to exclude the pre-transition period for Central and Eastern European countries.

We perform Arellano-bond GMM estimations on annual (unbalanced) panel data covering the period 1990-2002 and report the estimation results in Tables 2-5, along with the tests for the validity of instruments (Sargan test) and second-order autocorrelation. Based on the test results, we fail to reject the null in the case of both tests and all estimations. Thus, we conclude that there is not enough evidence to reject the hypothesis that the instruments are valid and the hypothesis that the average autocovariance in residuals of order 2 is zero.

Let us consider the following dynamic panel data model

$$y_{i,t} = \delta + \alpha y_{i,t-1} + \mathbf{X}_{i,t} \beta + \eta_i + \mu_{i,t} \quad (1)$$

where  $y$  is the rate of growth in income per capita,  $\mathbf{X}$  is a row vector of the endogenous and exogenous factors determining income,  $\eta_i$  is the individual (country) fixed effect,

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<sup>4</sup> As noted in Balamoune-Lutz (2007), some studies argue that an increase in self-employment in developing countries may indicate an increase in informal activities, often as a result of the inability of less-skilled workers to find jobs in the formal sector (Gong and Soest 2002). In this paper as in Balamoune-Lutz (2007), we do not analyse the extent to which self-employment is part of the formal sector. Also, several recent studies have used data from the Global Entrepreneurship Monitor (GEM). However, GEM data do not include panel data for a sufficiently large sample of developing countries.

<sup>5</sup> Several studies have stressed the role of capital-market constraints in preventing entrepreneurship by low-wealth agents (see, for example, Holtz-Eakin, Joulfarian and Rosen 1994; Blanchflower and Oswald 1998; Hurst and Lusardi 2004).

<sup>6</sup> Studies that have used the ICRG composite index or specific ICRG index components—such as the rule of law, democratic accountability, or the quality of bureaucracy—as proxies for the quality of institutions or institutional reform include La Porta et al. (1998); Acemoglu, Johnson and Robinson (2001); Brautigam and Knack (2004).

and  $\mu_{i,t}$  is a time-varying error term. Then we apply the Arellano-Bond specification and obtain the following:

$$\Delta y_{i,t} = \Delta y_{i,t-1}\alpha + \Delta \mathbf{X}_{i,t}\beta + \Delta \mu_{i,t} \quad (2)$$

The variables (on the right-hand side), INVEST (domestic investment as a ratio of GDP, in per cent), ENT, ICRG, OPEN, and CREDIT, as well as their interactions, are considered to be endogenous. In addition to the endogenous variables, we control for the level of development by including per capita income, and we also include a regional dummy for Latin America.<sup>7</sup>

#### 4 Empirical results

Table 1 shows relevant correlation coefficients. We observe that the correlation between most variables and growth is rather weak. The highest correlation (0.35) that growth has is with the measure of institutional quality (ICRG). On the other hand, per capita income has strong positive linear correlation with ICRG, and weaker correlation with the investment ratio, openness to trade, and the indicators of financial reform (M2 and credit to the private sector). Interestingly, the association between entrepreneurship (ENT) and the other variables is consistently negative and in some cases strong; -0.69 with income, and -0.45 with institutions and openness to trade.

The Arellano-Bond GMM estimation results are reported in Tables 2-5. First, we estimate the equations using the full sample (44 countries) and show the results in Table 2. Equation (1) portrays a simple model where we regress growth in per-capita income on the investment ratio (INVEST), institutional reform (ICRG), trade reform (OPEN), financial reform (CREDIT) and entrepreneurial intensity (ENT). We also control for the level of per capita income and include a dummy variable for Latin America. The results indicate that investment and institutional reform seem to have, as expected, a positive effect on growth. On the other hand, trade reforms and entrepreneurship do not seem to have an impact, while the proxy for financial reform shows up with a negative and highly significant coefficient. The coefficient on income is not significant, whereas the coefficient on the dummy for Latin America is negative and marginally significant (at the 10 per cent level).

In Equation (2), we account for the interplay of reforms (trade and financial reform) and entrepreneurial intensity. The results indicate that in both cases the interaction between these variables has a negative impact on growth, suggesting that reforms reduce the growth-enhancing effects of entrepreneurial activity. Note that in Equation (2) the

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<sup>7</sup> All equations are also estimated using dummy variables for Asia, transition economies and Sub-Saharan Africa (in separate estimations). Dummy variables for Asia and Sub-Saharan Africa were statistically insignificant and the dummy for transition economies had a statistically significant positive coefficient. All conclusions on the relationships between the other RHS variables and growth remain unchanged.

variables ENT and OPEN have a positive and highly significant coefficient, while the coefficient on the variable CREDIT is no longer significant (and is positive).<sup>8</sup>

In Equations (3)-(5) we examine the growth effect of the interplay of institutional reform (ICRG) and ENT and also test for the presence of non-linearity. There is support for a non-linear effect but only in the case of the interaction between financial reforms and entrepreneurship. Based on the results displayed in Table 2, we may conclude that the interplay of trade reforms and entrepreneurship has negative effects on growth if entrepreneurship is already vibrant and positive effects if entrepreneurial intensity is low.

Given that our full sample includes countries that have recently been added to the group of high income countries (for example, South Korea and Singapore) we adjust the sample by excluding all countries that are currently part of the high-income group. We re-estimate the equations and report the results in columns (1)-(3) of Table 3. Next, we exclude Sub-Saharan African countries and re-estimate the equations. We report the results in columns (4)-(6) in Table 3. The results are similar to those reported in Table 2 and, thus, we draw the same conclusions.

An alternative way to test this implication of the Iyigun-Rodrik theoretical model is to assess whether the interplay between the square of entrepreneurship and reforms is significant. We do this and report the results in Tables 4 and 5. The estimates in Table 4 where we use the full sample, and Table 5 where we exclude high-income countries<sup>9</sup> indicate that the interplay of the variable ENT squared and each of the reform proxies is statistically non-significant. It is important to note that the conclusions we outlined based on the previous results (Tables 2 and 3) remain strongly valid. In addition, we tried to control for human capital (results are not reported in the paper) by including total literacy rates and male and female literacy rates, as well as fertility rates but the coefficients on all these variables are statistically insignificant, and the previous conclusions remain the same. Thus, based on these results we may conclude that the growth effects of entrepreneurship seem, indeed, to depend on policy reform.<sup>10</sup>

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<sup>8</sup> All equations were also estimated using M2 instead of credit to the private sector (results are omitted from the paper but may be obtained from the author) and the conclusions are the same.

<sup>9</sup> Excluding SSA also yields similar results. Results are not reported in the paper but may be obtained from the author upon request.

<sup>10</sup> An alternative interpretation could be that the growth effects of policy reform may depend on the level of pre-existing entrepreneurships.

Table 1  
Correlation coefficients (p value)  
Pooled data

	ENT	GROWTH	INCOME	ICRG	OPEN	INVEST	CREDIT
GROWTH	-0.0085 (0.069)						
INCOME	-0.691 (0.000)	0.062 (0.079)					
ICRG	-0.453 (0.000)	0.347 (0.000)	0.605 (0.000)				
OPEN	-0.448 (0.000)	0.038 (0.295)	0.213 (0.000)	0.413 (0.000)			
INVEST	-0.294 (0.000)	0.286 (0.000)	0.316 (0.000)	0.420 (0.000)	0.418 (0.000)		
CREDIT	-0.112 (0.017)	0.102 (0.007)	0.350 (0.000)	0.413 (0.000)	0.257 (0.000)	0.422 (0.000)	
M2	-0.203 (0.000)	0.103 (0.005)	0.274 (0.000)	0.410 (0.000)	0.383 (0.000)	0.457 (0.000)	0.769 (0.000)

Notes: ENT: Entrepreneurial intensity, defined as the percentage of self-employment in total non-agricultural employment;

INCOME (pc): GDP per capita, PPP (constant 1995 international \$). Purchasing-power-parity value of income per capita in 1995 constant international dollars. PPP GDP is gross domestic product converted to international dollars using purchasing power parity rates;

GROWTH: The rate of annual growth in income per capita;

OPEN: Openness to trade, the sum of imports and exports as a % of GDP;

ICRG: International Country Risk Guide rating, published by the Political Risk Services (PRS) Group and includes three subcategories of risk; economic, political, and financial risk. These categories include scores on of 22 risk components. The World Bank publishes composite scores with values ranging from zero (highest risk) to 100 (lowest risk);

CREDIT: Domestic credit to private sector (% of GDP), refers to financial resources provided to the private sector, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises;

M2: Broad money (M1 plus M2) as a percentage of GDP; and

INVEST: Domestic investment as a percentage of GDP.

Source: Data on ENT are from LABORSTA dataset produced by ILO. All other data are from World Bank *World Development Indicators* database (2005).

Table 2  
 Arellano-Bond GMM estimation, full sample  
 (Dependent variable: growth of income per capita)

	(1)	(2)	(3)	(4)	(5)
Growth (lagged)	0.079* (0.045)	0.046 (0.044)	0.014 (0.044)	0.018 (0.044)	0.019 (0.044)
Endogenous variables					
INVEST	0.196*** (0.038)	0.183*** (0.056)	0.222*** (0.056)	0.218*** (0.056)	0.218*** (0.056)
ICRG	0.288*** (0.040)	0.299*** (0.037)	0.302*** (0.037)	0.265*** (0.101)	0.271** (0.107)
OPEN	1.194 (1.339)	11.559*** (2.967)	10.591*** (2.930)	10.448*** (2.931)	10.405*** (2.947)
ENT	-0.021 (0.080)	1.878*** (0.420)	2.322*** (0.882)	1.317*** (0.466)	1.270** (0.466)
CREDIT	-3.267*** (0.774)	1.303 (1.883)	3.091 (1.901)	3.088 (1.917)	3.059 (1.928)
ENT X OPEN		-0.353*** (0.094)	-0.774** (0.387)	-0.318*** (0.093)	-0.316*** (0.094)
ENT X CREDIT		-0.137*** (0.053)	0.154* (0.089)	0.143 (0.090)	0.142 (0.090)
ENT X OPEN_SQ			0.055 (0.045)		
ENT X CREDIT_SQ			-0.054*** (0.013)	-0.052*** (0.013)	-0.052*** (0.013)
ENT X ICRG				0.0013 (0.003)	0.0028 (0.009)
ENT X ICRG_SQ					-0.0001 (0.0007)
Exogenous variables					
INCOME (initial)	-0.116 (0.111)	-0.263** (0.112)	-0.227** (0.111)	-0.235** (0.112)	-0.232** (0.113)
LAAM	-0.226* (0.114)	-0.221** (0.112)	-0.209* (0.111)	-0.246** (0.110)	-0.246** (0.111)
TRANSITION					
Number of obs.	345	345	345	345	345
Sargan test <sup>a</sup> , chi2	390.64	390.82	387.55	388.58	388.58
M2 <sup>b</sup> , z; [pr > z]	-1.04 [0.30]	-1.33 [0.18]	-1.36 [0.17]	-1.38 [0.17]	-1.37 [0.17]

Notes: <sup>a</sup> Sargan test of over-identifying restrictions (Null: Instruments are valid);

<sup>b</sup> Arellano-Bond test that average autocovariance in residuals of order 2 is 0;

The constant is not reported;

See Table 1 for variable definition;

\* Significant at 0.10 level; \*\* significant at 0.05 level; \*\*\* significant at 0.01 level.

Source: Data on ENT are from LABORSTA dataset produced by ILO. All other data are from World Bank *World Development Indicators* database (2005).

Table 3  
Arellano-Bond GMM estimation  
(Dependent variable: growth of income per capita)

	Excluding high-income countries			Excluding high-income countries and SSA		
	(1)	(2)	(3)	(4)	(5)	(6)
Growth (lagged)	0.005 (0.046)	0.009 (0.046)	0.007 (0.046)	-0.008 (0.047)	-0.003 (0.047)	-0.006 (0.047)
Endogenous variables						
INVEST	0.280*** (0.059)	0.276*** (0.059)	0.277*** (0.060)	0.295*** (0.062)	0.290*** (0.062)	0.292*** (0.062)
ICRG	0.306*** (0.037)	0.277*** (0.105)	0.248** (0.110)	0.308*** (0.038)	0.290** (0.112)	0.259** (0.117)
OPEN	10.183*** (3.012)	10.073*** (3.017)	10.299*** (3.034)	10.299*** (3.034)	10.728*** (3.230)	10.888*** (3.245)
ENT	2.223*** (0.881)	1.379*** (0.482)	1.673*** (0.575)	1.983** (0.930)	1.115* (0.584)	1.400** (0.656)
CREDIT	3.683* (2.102)	3.750* (2.108)	3.931* (2.122)	2.223 (2.122)	2.355 (2.534)	2.537 (2.550)
ENT X OPEN	-0.713* (0.389)	-0.322*** (0.094)	-0.335*** (0.095)	-0.769* (0.297)	-0.353*** (0.099)	-0.363*** (0.101)
ENT X CREDIT	0.177* (0.093)	0.166* (0.093)	0.172* (0.094)	0.359** (0.148)	0.343** (0.148)	0.355** (0.149)
ENT X OPEN_SQ	0.047 (0.045)			0.050 (0.047)		
ENT X CREDIT_SQ	-0.063*** (0.014)	-0.061*** (0.013)	-0.064*** (0.014)	-0.085*** (0.018)	-0.082*** (0.018)	-0.085*** (0.019)
ENT X ICRG		0.001 (0.003)	-0.008 (0.0100)		0.0006 (0.003)	0.009 (0.010)
ENT X ICRG_SQ			0.0001 (0.0001)			0.0001 (0.0001)
Exogenous variables						
INCOME (initial)	-0.322** (0.126)	-0.330*** (0.127)	-0.348*** (0.129)	-0.323** (0.131)	-0.338** (0.134)	-0.355*** (0.134)
LAAM	-0.236* (0.121)	-0.265* (0.119)	-0.268** (0.119)	-0.245* (0.126)	-0.276** (0.119)	-0.282** (0.126)
TRANSITION						
Number of obs.	318	318	318	299	299	299
Sargan test <sup>a</sup> , chi2	346.26	346.93	344.17	331.05	331.54	328.48
M2 <sup>b</sup> , z; [pr > z]	-1.22 [0.22]	-1.22 [0.22]	-1.17 [0.24]	-1.23 [0.22]	-1.24 [0.21]	-1.19 [0.23]

Notes: <sup>a</sup> Sargan test of over-identifying restrictions (Null: Instruments are valid);

<sup>b</sup> Arellano-Bond test that average autocovariance in residuals of order 2 is 0;

The constant is not reported;

See Table 1 for variable definition;

\* Significant at 0.10 level; \*\* significant at 0.05 level; \*\*\* significant at 0.01 level.

Source: Data on ENT are from LABORSTA dataset produced by ILO. All other data are from World Bank *World Development Indicators* database (2005).

Table 4  
 Arellano-Bond GMM estimation  
 (Dependent variable: growth of income per capita)  
 Including ENT squared and its interaction with other variables

	(1)	(2)	(3)	(4)
Growth (lagged)	0.017 (0.044)	0.018 (0.044)	0.0459 (0.044)	0.019 (0.044)
<i>Endogenous variables</i>				
INVEST	0.215*** (0.056)	0.213*** (0.055)	0.184*** (0.057)	0.215*** (0.056)
ICRG	0.304*** (0.036)	0.304*** (0.036)	0.299*** (0.037)	0.249** (0.106)
OPEN	10.216*** (2.983)	10.430*** (2.922)	11.557*** (2.971)	10.443*** (2.934)
ENT	1.427*** (0.437)	1.371*** (0.430)	1.876*** (0.421)	1.348*** (0.471)
CREDIT	3.025 (1.900)	2.090 (2.106)	1.467 (2.145)	3.094 (1.919)
ENT X OPEN	-0.296*** (0.104)	-0.322*** (0.093)	-0.352*** (0.095)	-0.320*** (0.093)
ENT X CREDIT	0.144 (0.089)	0.243* (0.133)	0.149 (0.093)	0.144 (0.090)
ENT X CREDIT_SQ	-0.052*** (0.013)	-0.056*** (0.014)		-0.052*** (0.013)
ENT X ICRG				0.028 (0.044)
ENT_SQ X OPEN	-0.0005 (0.001)			
ENT_SQ X CREDIT		-0.001 (0.001)	-0.0002 (0.001)	
ENT_SQ X ICRG				-0.0003 (0.0005)
<i>Exogenous variables</i>				
INCOME (initial)	-0.249** (0.112)	-0.253** (0.111)	-0.261** (0.114)	-0.245** (0.113)
LAAM	-0.239** (0.110)	-0.238** (0.110)	-0.221** (0.112)	-0.242** (0.111)
Number of obs.	345	345	345	345
Sargan test <sup>a</sup> , chi2	389.02	389.93	389.63	387.65
M2 <sup>b</sup> , z; [pr > z]	-1.38 [0.17]	-1.36 [0.18]	-1.32 [0.19]	-1.36 [0.17]

Notes: <sup>a</sup> Sargan test of over-identifying restrictions (Null: Instruments are valid);

<sup>b</sup> Arellano-Bond test that average autocovariance in residuals of order 2 is 0;

The constant is not reported;

See Table 1 for variable definition;

\* Significant at 0.10 level; \*\* significant at 0.05 level; \*\*\* significant at 0.01 level.

Source: Data on ENT are from LABORSTA dataset produced by ILO. All other data are from World Bank *World Development Indicators* database (2005).

Table 5  
 Arellano-Bond GMM estimation  
 (Dependent variable: growth of income per capita)  
 Including ENT squared and its interaction with other variables  
 and excluding high-income countries from the sample

	(1)	(2)	(3)
Growth (lagged)	0.087 (0.044)	0.042 (0.047)	0.009 (0.046)
Endogenous variables			
INVEST	0.273*** (0.059)	0.228*** (0.060)	0.273*** (0.059)
ICRG	0.308*** (0.037)	0.302*** (0.038)	0.261** (0.110)
OPEN	9.967*** (3.063)	11.299*** (3.072)	10.071*** (3.020)
ENT	1.462*** (0.446)	1.998*** (0.434)	1.402*** (0.485)
CREDIT	3.706* (2.102)	2.749* (2.472)	3.702* (2.113)
ENT X OPEN	-0.309*** (0.105)	-0.356*** (0.095)	-0.324*** (0.094)
ENT X CREDIT	0.167* (0.092)	0.217** (0.103)	0.168* (0.093)
ENT X CREDIT_SQ	-0.061*** (0.013)		-0.061*** (0.013)
ENT X ICRG			0.003 (0.004)
ENT_SQ X OPEN	-0.0003 (0.001)		
ENT_SQ X CREDIT		-0.0007 (0.001)	
ENT_SQ X ICRG			-0.0003 (0.001)
Exogenous variables			
INCOME (initial)	-0.343*** (0.127)	-0.339*** (0.128)	-0.341*** (0.129)
LAAM	-0.258** (0.119)	-0.236** (0.121)	-0.261** (0.119)
Number of obs.	318	318	318
Sargan test <sup>a</sup> , chi2	347.18	350.70	345.96
M2 <sup>b</sup> , z; [pr > z]	-1.23 [0.22]	-1.19 [0.24]	-1.21 [0.23]

Notes: <sup>a</sup> Sargan test of over-identifying restrictions (Null: Instruments are valid);

<sup>b</sup> Arellano-Bond test that average autocovariance in residuals of order 2 is 0;

The constant is not reported;

See Table 1 for variable definition.

\* Significant at 0.10 level; \*\* significant at 0.05 level; \*\*\* significant at 0.01 level.

Source: Data on ENT are from LABORSTA dataset produced by ILO. All other data are from World Bank *World Development Indicators* database (2005).

## 5 Conclusion

This paper examines the interplay of institutional and policy reforms and entrepreneurship, and explores its effect on growth. More specifically, we test an important implication of the Iyigun-Rodrik model (Iyigun and Rodrik 2005), that institutional reform would have negative (positive) effects if pre-existing entrepreneurial activity is vibrant (weak), while ‘policy tinkering’ will have a positive (negative) effects if pre-existing entrepreneurial activity is vibrant (weak). We do so by using panel data from developing and transition economies and estimating Arellano-Bond GMM growth equations where we include proxies for entrepreneurial intensity and institutional and policy reforms, as well as their interactions.

We find that the interplay of entrepreneurship and policy reforms has an influence on the growth effects of entrepreneurship. We show that the joint effect of trade reform and entrepreneurship on growth is negative, suggesting that trade reform diminishes the positive effects of entrepreneurial ability on growth if entrepreneurial activity is vibrant. We find that the interplay of financial sector reform and entrepreneurship has a non-linear effect on growth. Financial reforms enhance the growth effects of entrepreneurship initially and diminish it at high levels of reform. Moreover, we show that the interplay of institutions and entrepreneurship does not seem to matter for the impact on growth.

The results related to the interplay of trade reform and entrepreneurial intensity are consistent with those derived in Balamoune-Lutz (2007) and Iyigun and Rodrik’s (2005) empirical estimation (although Iyigun and Rodrik view changes in openness to trade as institutional reform) using cross-sectional data from a group of developed and developing countries. However, in contrast to Iyigun and Rodrik’s results, we show that once we control for the interplay of reforms and entrepreneurship, the indicators of institutional reform, trade reform, and entrepreneurship (separately) all have a positive effect on growth and are robustly significant. Iyigun and Rodrik find a negative and statistically significant (at the 5-per cent level) coefficient on entrepreneurial intensity. With regard to the interplay of institutional reform and entrepreneurship, and at least in the case where we control for the interaction between ENT squared and ICRG, the findings in the present paper are different from those derived in Balamoune-Lutz (2007) where the author uses a sample of developed and developing countries and shows that this interplay has a positive effect on growth, implying that institutional reform could enhance the growth effects of entrepreneurship. It is possible that these differences stem from the fact that developed countries have much better institutions and thus the disparity in institutional reform would be more significant in a sample that includes developing and developed countries.

In summary, the empirical results suggest that trade and financial reforms can reduce the growth effects of entrepreneurship, although financial reforms seem to have a positive effect in early stages (low doses) of reform. On the other hand, institutional reform does not seem to influence the growth effects of entrepreneurship. Overall, these findings seem to be consistent with the predictions and arguments developed in Iyigun and Rodrik’s (2005) theoretical model, if one assumes that a change in a country’s openness to trade or in its ratio of credit to the private sector is a result from policy reform (also viewed by Iyigun and Rodrik as institutional reform), not policy tinkering. The growth effects of entrepreneurial activity seem to depend on pre-existing levels of entrepreneurship and on policy reforms. In settings where entrepreneurial activity is

vibrant, reforms could have a negative outcome, while in settings with weak entrepreneurial activity reforms would enhance the growth effects of entrepreneurship. It is possible, for example, that in settings where entrepreneurial activity is strong, a trade or credit market reform would induce the incumbents to bribe or be part of other rent-seeking activities to access input or output markets, or to eliminate possible competition (new entrants) which would have a negative effect on growth.

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