

Investigating How the Drivers of Business Creation Changed in the Great Recession

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Abstract: In light of a recent wave of economic research emphasising the important role of entrepreneurship in overcoming unemployment and stimulating a robust, sustained recovery during economic recession, this paper examines the drivers of business creation in the context of the Great Recession. This paper exploits the heterogeneous economic impact of the Great Recession during 2004-2011 and socio-economic variation across 72 economies to model the changing influence of policy-related factors along the business cycle. More specifically, the variables analysed include measures of private sector regulation; government effectiveness indicators; and start-up costs and bureaucracy. Existing literature provides extremely few findings on the changing role of these variables across the business cycle, and fails to provide a granular picture of their influence as the use of composite measures is commonplace.

The final model finds evidence of the increased efficacy of tax cuts, investor protection, credit market transparency and government credibility to long-term economic policy during years of economic recession. Perhaps counterintuitively, it contradicts findings in the literature in suggesting that the deterrence effect of relatively small, generic start-up costs – such as the cost of registering new property – actually falls in recession.

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1 Introduction

There exists an extensive body of literature highlighting the sustainable impact of entrepreneurship on GDP growth, innovation and competition. Despite this, a lack of data on entry barriers at the national level has led to a shortcoming of research on the topic. The World Bank's Doing Business institute, established in 2004, was a direct response to this issue. This paper will use the institute's data to exploit socio-economic heterogeneity across six continents to determine how specific national-level entry barriers and varying measures of government effectiveness influenced entrepreneurship rates in the global boom and bust cycle since 2004. While modelling a broader range of economies than used elsewhere, it will uncover how the influence of factors such as start-up costs, domestic finance markets and investor protection changes in a recession, and consequently justify certain government responses as a means of aiding recovery.

2 Motivation

Economic theory shows that firm creation boosts consumer welfare by increasing competition. Perhaps more poignant given the state of the global economy, however, is that new firm formation significantly spurs economic recovery (van Stel, 2008 and Koellinger, 2009). Beyond providing employment for those directly involved – an important outcome in itself given soaring global unemployment rates during the Great Recession - start-ups provide a disproportionately high level of new knowledge, either as new products or processes (*Baumol, 2007*), and quickly diffuse innovative techniques developed elsewhere. The benefit of entrepreneurship to the wider economy is sustained, and can start at even the most unlikely of times: 57% of today's Fortune 500 companies were founded in recessionary conditions (Stangler, 2009).

Previous research into the topic has left many questions unanswered, however, and the Great Recession has created the statistical variation required to robustly model the impact of economic and political drivers on the rate of company creation. While applying a broad set of controls, this paper will analyse a wider range of countries and will model the influences of entrepreneurship rates at a more granular level than in any of the literature to answer the following questions:

1. *How do the effects of policy-related drivers of entrepreneurship - such as the bureaucratic requirements of firm setup; government quality indicators; private sector regulation and start-up costs - differ in periods of economic growth and recession?*
2. *Given these differing effects during recession, how should government policy respond to best support entrepreneurship as a means of spurring economic recovery?*

3 Existing Literature

3.1 *The Influence of Start-Up Costs, Bureaucracy and Taxation*

Literature has treated the national business environment as an umbrella term, chronically failing to differentiate between factors which impact business formation. Work by Papaoikonomou et al. (2011) at the entrepreneur level identifies high start-up costs, low credit supply and over-complicated bureaucracy as the most powerful deterrents of business creation. In addition, the statistical insignificance of multiple factors which are commonly thought to influence entrepreneurship emphasises the value of deconstructing aggregated “business environment” variables.

Klapper et al. (2004) confirm the findings of Papaoikonomou et al. (2011) concerning the damaging impact of bureaucracy. Their work has significant merit, though the small pool of similar European economies during two economically nondescript years hinders the robustness of their insights.

Dyck et al. (2011) also attempt to differentiate between a range of entry barriers, in the same fashion as Papaoikonomou et al. The findings here contradict the previous papers, instead showing that entry costs (% of GDP/capita); the number of bureaucratic procedures; and the time required for firm registration are all insignificant. However, the work suffers from a weakness prevalent throughout the literature: it considers very few observations and does not test for varying impacts of these drivers depending on domestic GDP growth rates.

3.2 *The Influence of Effective Governance, Private Sector Regulation and Credit Market Support*

With regards to the role of government perception, the 2011 Global Report of the Global Entrepreneurship Monitor (Kelly et al., 2011) finds a strong positive correlation between the credibility of government economic policy and the level of entrepreneurial activity. This is confirmed by the findings of Dyck et al. (2011), Kosi et al. (2013) and Estrin (2010), which all show that a lack of business confidence in either the suitability of long-term socio-economic policy or in the credibility of national economic policy are amongst the most powerful deterrents of business creation across the OECD from 1995-2007. None of these papers, however, investigate whether this relationship becomes more or less pronounced across the stages of the business cycle.

The most comprehensive analysis of the impact of private sector regulation on entrepreneurship is provided by Levie et al. (2010), who apply suitable controls while measuring the effect of regulation on entrepreneurship in 54 countries across 2004-2010. However, their arbitrary

combination of nine regulatory variables into a single measure – the “Regulatory Burden Index”- means that their findings have vague implications and made their results an artefact of their own creation, since restructuring the index causes different outcomes.

The availability of credit for the private sector is also reported to be a significant driver of entrepreneurship. The influential paper by Rajan and Zingales (2003) emphasised this positive relationship, which was shown empirically by Klapper et al. (2006) in 21 European countries and by Alfaro and Charlton (2010) in 98 countries from 1999-2004. Though these papers lay the foundation for the modelling conducted here, none look deeper into the changing nature of this relationship depending on the state of the economy, and the breadth of the controls employed could be questioned.

3.3 The Natural Cyclicity of Entrepreneurship

The work of Congregado (2009) raises an important yet unanswered question. Regressions on Spanish data suggested pro-cyclicity of entrepreneurship, supporting surveys conducted by Papoikonomou (2010) in which entrepreneurs frequently cited higher sales uncertainty as a major deterrent to business creation during a recession. However, Congregado found acyclicity when modelling US data. In 2008, however, both economies had been hit similarly by the recession, with unemployment at 8-10%. This paper will investigate how differing domestic institutions and recessionary conditions in Spain and the USA may explain dissimilar business-start rates.

4 Objective & Contribution to the Literature

In response to the weaknesses of the literature above, this paper will break down the umbrella of entry regulation into its component parts and robustly model how the drivers of entrepreneurship changed along the business cycle. Such analysis can provide an insight into how private sector regulation, taxation rates and other policies should be tailored depending on the state of the economy in order to promote firm creation.

5 Hypotheses

The following hypotheses are guided by previous findings, but based on intuition given the lack of previous research into the changing influence of variables impacting entrepreneurship along the business cycle:

i) *During years of recession, increasing start-up costs and restrictions on profit retention (i.e. profit taxes) will be more powerful deterrents to business creation than during economic growth.*

This hypothesis is underpinned by research showing that the proportion of firms established by first-time entrepreneurs increases during recession. The intuition is that increasing taxes or start-up costs are more damaging to incentives during recession given the uncertainty of first-time entrepreneurship faced by a larger proportion of the entrepreneur pool. Figure 1a supports this, showing a stronger negative relationship between profit tax rates and firm-creation during recession.

ii) *During periods of recession, entrepreneurship will become more elastic with respect to credit availability given the drying up of lending which was common across developed nations.*

The inverse is shown by plotting new business density against domestic credit levels (figure 1b). This certainly does not disprove the hypothesis, however, as there are no controls employed through such graphing.

iii) *The positive influence of socio-economic policy quality and government credibility will be greater in a recession, as investors and entrepreneurs become increasingly risk averse.*

The need for economic stability and confidence in future plans is likely to be higher for the entrepreneur during economic volatility. Figure 1c supports this hypothesis by illustrating a more positive relationship between the two measures during a recession.

iv) *During periods of economic recession, regulatory measures serving to protect investors will be more effective in increasing firm formation, as investors become more risk averse.*

Figure 1 *Graphs relating to the hypotheses above.*

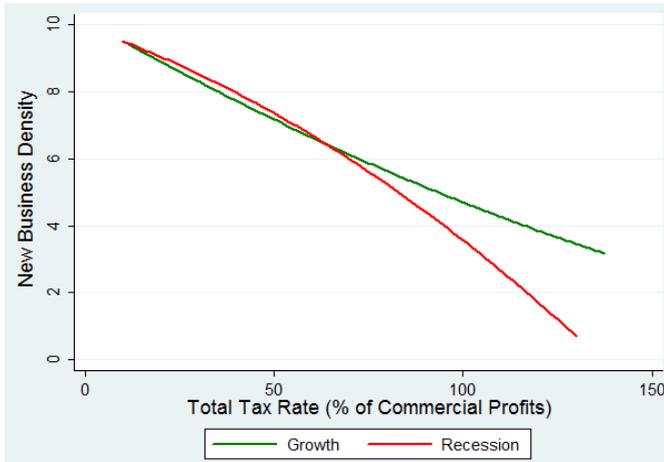


Figure 1a *Profit tax rates plotted against new business density (the dependent variable).*

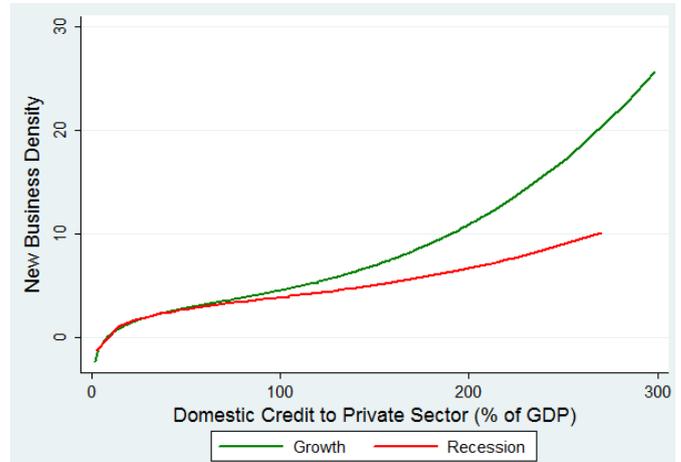


Figure 1b *Domestic lending as a proportion of GDP plotted against new business density.*

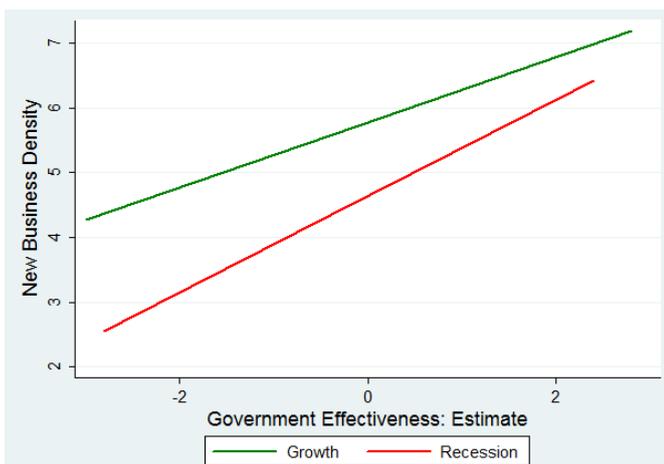


Figure 1c *A government effectiveness indicator reflecting the factors discussed in hypothesis 3 plotted against new business density.*

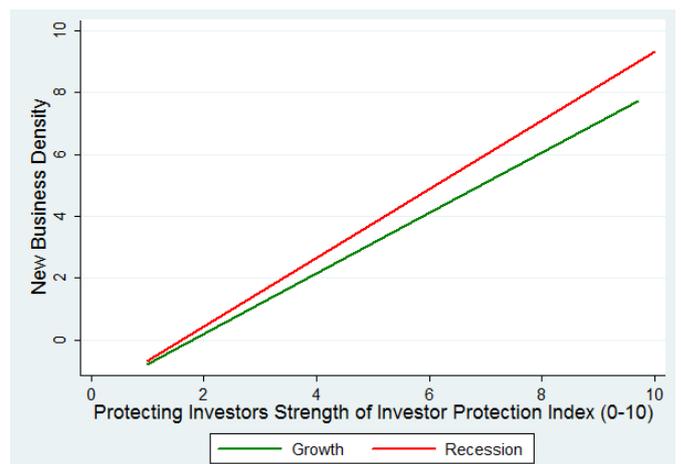


Figure 1d *A World Bank indicator of investor protection plotted against new business density.*

6 Data Sources, Data & Observations

6.1 Data Sources & Data

The dependent variable employed is the logarithmic scale of the World Bank’s “New Business Density” measure, which reflects the number of newly registered companies per 1,000 working-age citizens (aged 15-64) in an economy over a single year (A9).

These statistics, along with data for independent variables of interest concerning business creation procedures and costs, have been sourced from the World Bank’s Doing Business

database (World Bank, 2013). Additional variables regarding government credibility and private sector regulation have been sourced from the Worldwide Governance Indicators database (World Bank, 2013).

Macroeconomic control variables, such as unemployment and GDP growth rates, as well as socio-economic control variables including internet access and urbanisation rates have been taken from the IMF's World Economic Outlook Database (IMF, 2013) and the World Bank's Databank.

6.2 Observations

This paper seeks to exploit the heterogeneity of a pool of economies larger than those used in the literature. Data has been compiled on 72 countries across six continents, over 2004-2011 to create a sample of 576 observations.

7 The Empirical Process

7.1 Measures Applied Throughout

A 10% significance level was applied throughout the econometric modelling. The 10% figure increases the probability of Type I error compared to lower significance levels, but it provides leniency required here as the sample size is relatively small compared to those in the thousands used regularly in econometric analysis.

Moreover, Heteroscedasticity is overcome through the use of robust standard errors as a response to a Modified Wald test completely rejecting homoscedasticity (A8).

7.2 Mean Replacement & Generating Required Variables

Missing observations were present in a number of variables of interest. To maintain the sample size, missing values were replaced with the sample mean. To overcome potential bias caused by this technique, a "missing" dummy variable was created to partner each variable in which any mean replacement occurred (e.g. *gdpgrowthmiss* accounts for bias in *gdpgrowth*). Any observation receiving mean replacement took the value of 1 in the related "missing" dummy variable. Regardless of their significance, these "missing" dummy variables are always included in models in which their respective relevant variables are present.

Additionally, "year" dummy variables were created for 2005-2011 (leaving 2004 as default) and were modelled regardless of statistical insignificance to avoid biasing other coefficients.

Logarithmic values of continuous independent variables were used wherever suitable to overcome the biasing effect of extreme values and to create elasticities. Squared terms of continuous variables were created and included in early regressions, yielding numerous statistically significant, non-linear relationships.

Finally, a “recession” dummy variable was created and equal to 1 if a country saw negative growth over a single year. This was multiplied with various independent variables of interest, yielding numerous statistically significant multiplicative terms which show how the effect of an individual factor differed during recession compared to growth.

The final model specification:

$$\ln(\text{newdensity}) = \alpha + \beta_i + \sum_{j=1}^n \gamma x_{it} + \sum_{k=1}^m \delta x_{it} R_{it} + \sigma D_t + \sum_{l=1}^o \lambda \text{missing}_{it} + u_{it}$$

α	A constant which applies to all observations.
β_i	Accounts for unobserved heterogeneity by taking a single value for each country over all eight years. Relevant constant unobservables are discussed in section 7.3.
$\sum_{j=1}^n x_{it}$	The set of explanatory variables.
$\sum_{k=1}^m x_{it} R_{it}$	An interactive term measuring the differing impact of certain explanatory variables during years of recession.
R_{it}	The “recession” dummy variable, which =1 if yearly growth for country i in period t is negative, and =0 otherwise.
σD_t	Yearly dummy variables from 2005-2011.
$\sum_{l=1}^o \text{missing}_{it}$	Numerous missing dummy variables which overcome the potential biasing of coefficients which have seen instances of mean replacement.

7.3 Model Specification Tests

At multiple stages of the model refinement process, Hausman tests were run to investigate the suitability of fixed-effects analysis. In all instances, the null hypothesis of no systematic differences in the coefficients of identical fixed-effects and random-effects models were completely rejected (A7). This supports intuition and literature, which suggest underlying differences in entrepreneurship and risk taking across countries. These constant, unobservable

drivers include social attitudes; economic factors such as the maturity of domestic credit markets; and geographical influences of economic structure such as the weather. As such, fixed-effects analysis was applied.

7.4 Instrumental Variable Analysis

The final fixed-effects regression raised questions of potential endogeneity of the variable *banklendingrate2*, which reflects the average interest rate on bank loans to private sector firms. Endogeneity could be caused by underlying influences of both the bank lending rate and business formation, such as overall economic confidence. The two instruments used are *ler* (logged exchange rate against the US dollar) and *cpi*, which are unlikely to drive entrepreneur decision-making through any mechanism other than bank interest rates.

The relationships between these two instruments and lending rates have been shown theoretically and empirically using market data, supported by an instrument relevance test (A6). Further testing revealed a Hansen J-Statistic proving instrument exogeneity and that *banklendingrate2* cannot be treated as exogenous, completing the criteria for suitable IV analysis (A4).

Instrumental variable modelling dramatically increased the significance of *banklendingrate2* from 0.792 in the final fixed-effects model to 0.15 in the final IV model. However, the coefficient on *banklendingrate2* is positive in the IV model, suggesting that a 1 percentage point increase in the lending rate increased new business density by 2.9%. This may suggest that endogeneity is not entirely overcome. However, the negative domain is clearly within the coefficient's 95% confidence interval (with a lower bound of -1.17%), so the issue may be attributed to sample size, or omitted relevant variable bias (discussed in 9.1: Limitations of the Model).

8 Results

8.1 Control Variables and Notable, Non-Policy Related Drivers

The cyclicity of business formation is a divisive issue in the literature. The IV analysis here may explain ambiguous findings such as those of Congregado et al. (2009) which highlighted procyclicality in Spain but acyclicality in the USA. The IV model highlights that each percentage point gain in GDP growth increases business creation by 1.2%, but that a 1% increase in the unemployment rate increases business creation by 0.08%. These coefficients suggest counteracting forces: increased business confidence during economic growth supports procyclicality, though higher unemployment during economic hardship supports countercyclicality.

The cyclical nature of entrepreneurship, therefore, depends on the ratio of GDP growth fall to unemployment rate rise.

Example of business creation dynamics:

Change in the economy	Resulting Growth in New Business Density
Annual GDP growth falls from 3% to 0%	$3(-1.2\%) = -3.6\%$
Unemployment rises from 4% to 7.5%	$87.5(0.08\%) = 7\%$
Net Effect:	3.4% Growth

Many other control variables were used such as GDP/capita and urbanization rates (A3), but their coefficients are not of interest in the context of this paper.

8.2 Drivers with Cyclical Effects and Policy Implications

8.2a Taxation and Governance

The first policy area addressed by both models concerns *ltotaltax*, a log measure of the profit tax rate after allowable deductions. Ceteris paribus, a concave relationship is found, meaning an exponentially increasing deterrent effect of tax rates in the positive domain. The statistically significant coefficient on *recltottax* shifts the concave curve left, showing that the increasing marginal disincentive effect is more pronounced in a recession, as hypothesised (figure 2). This finding has an important implication: the efficacy of tax cuts in encouraging firm formation is larger in a recession, supporting policy suggestions for tax exemptions for small businesses during economic hardship.

Further policy implications can be drawn from the coefficients relating to government effectiveness (*govteff*), a comprehensive indicator including the removal of excessive red tape (particularly for foreign investors) and government commitment to suitable long-term economic policy stances. The coefficient on *govteff* represents a 22.6% increase in new business density per point improvement in the score assigned by World Bank experts during growth years, which supports the results of Dyck et al. (2011), Kosi (2013) and Estrin et al. (2010). In addition, the statistically significant coefficient on *recgovteff* means the same improvement in the government effectiveness score boosted business creation by 38.2% during a recession. This 72% rise in the influence of government effectiveness during years of recession supports hypothesis iii. Though this business creation effect alone is insufficient to trigger fundamental changes in government credibility, it may lend weight to streamlining business-related bureaucracy.

8.2b Market Regulation

Three regulatory factors considered in the final IV model – *investorprot*, *disclosure* and *credinf* – show very different, statistically significant effects in recession. The specificity of the results identified in this section is a considerable step forward from the work of Levie et al. (2010), which aggregated measures of private sector regulation.

Investorprot, reflecting the extent of director liability and shareholders' ability to sue directors for misconduct, became over three times more important to business creation during recession. As hypothesised, a 10 percentage point rise in the index increased new business density by 3.7% during growth and by 11.65% in recession holding all else constant.

Disclosure, an index covering the transparency of the financial dealings of directors to help shareholders and investors, became a much stronger disincentive. A 10 percentage point rise in score lowered business creation by 2.5% during economic growth and 7.8% in a recession. This may reflect a business quality effect: higher requirements of director disclosure may intimidate or force out potential first-time entrepreneurs who make up a larger proportion of the entrepreneur pool during a recession. This could lend support to maintaining high disclosure requirements during recessions in order to protect investors from potentially deteriorating financial robustness of start-ups.

Credinf, the availability of credit information from either public or private registries to support lending decisions, changes from hindering to supporting entrepreneurship when an economy moves from growth to recession. A one unit increase in a growing economy's score caused a 3.4% decline in new business density, while the same improvement during recession boosted entrepreneurship rates by 1.5%. The negative coefficient during growth is difficult to explain, and may point towards omitted relevant variable bias. However, there may be an underlying story of quality: for example, increasing confidence experienced alongside economic growth may give rise to individuals with poor credit histories seeking to start businesses. In this case, high levels of credit information would act as a quality check, restricting entrepreneurship. Even if omitted relevant bias is causing the coefficient on *credinf* to be negative when it should be positive, the *reccredinf* coefficient demonstrates higher returns to business creation from improving credit information during recession.

These findings add to economic literature by suggesting that specific entry regulation adjustments can optimise the quality and rate of business creation during a recession.

8.2c Non Business-Specific Start-Up Costs

Lcostelec reflects the cost to establish a permanent electricity connection. The statistically significant coefficient on *reclcostelec* shifts the negative, convex relationship upwards in recession (figure 3). The flatter curve during recession means that electricity setup costs are a less powerful deterrent during recession.

A similar effect was seen in the cost of registering new property, *lcostregprop*, a second non-specific start-up cost. A 1% rise in the cost to register property caused new business density to fall by 0.026% in growth years and by 0.0049% in recession. The partial neutralisation of the negative impact of these start-up costs in a recession opposes intuition and previous literature. One possible explanation is derived from the size of these costs. The median cost of electricity acquisition (before mean replacement and excluding extreme outliers) is around 25% GDP/capita and of property registration is 3% of the property value.

These findings completely oppose hypothesis i. However, they suggest that there may be a heterogeneous change in the role of start-up costs as an economy slips into recession, though this is not covered in the literature. It is possible that smaller start-up costs become less of an obstacle in recession, as these small costs are unlikely to require external funding and the necessity of an income source for the entrepreneur becomes a major driver of the business-creation decision. These small costs may be more of an obstacle during economic growth when entrepreneurship is based on calculations of welfare gain starting in a position of employment. On the other hand, *lcoststartbus* (the cost of fulfilling start-up procedures) showed no statistically significant difference in a recession. It is possible, therefore, that the relationship hypothesised does in fact exist, though between entrepreneurship rates and large start-up costs. Understanding this difference is a potential avenue of future research.

8.2d Private Sector Credit Availability

The final results relating to the hypotheses above concern to the supply of domestic credit to the private sector, offered through loans, non-equity securities and trade credits. The IV model finds that private sector credit had a negative effect on business creation (figure 4), which goes strongly against intuition and the work of Klapper et al. (2004).

Interestingly, removing the 19 outlier cases of extreme government corruption, which include all observations from Afghanistan and Iraq, and re-running the same IV fixed-effects model shows credit as a support to entrepreneurship (table 2). The removed observations account for almost all of the lowest 10% of values in the variable *privcredgdp*, supporting the findings of Massenot and Straub (2011) that informal financing is more important in such economies, but report median

levels of new business density. These observations biased the entire sample, and their removal leads to the findings in table 2 and figure 5.

It was hypothesised that limited credit, which characterised the Great Recession, would increase the positive marginal effect of credit availability on business creation during years of negative growth. The inverse is found, however, as shown in figure 5. The downward shift of the curve is more difficult to explain, but may be related to the model's controlling of other credit market factors such as information availability. Possible explanations are covered in section 9.1.

8.3 Acyclical Drivers with Policy Implications

Bureaucracy and costs incurred in exporting goods play a statistically significant, acyclical role in firm creation. The variable *lusedxpcnt* highlights a concave relationship between the US dollar cost of exporting a container and firm formation (figure 6), with an increasing marginal deterrent effect of export costs on entrepreneurship rates.

Moreover, as suggested by the work of Papaoikonomou et al. (2011), a 1% rise in the number of documents required to export lowered new business density by 0.09%, both in growth and recession ($p=0.13$). The average number of documents is five, meaning a 20% hike to six documents would have caused a 1.8% fall in firm formation. These two variables, along with the coefficient on *ltradegdp*, emphasise the importance of start-up costs and bureaucracy in the context of exporting and the impact of international market openness.

Finally, converse to the findings concerning *lcostelec* and *lcostregprop*, there were no statistically significant differences found in the effect of the cost of fulfilling start-up procedures during years of economic growth and recession. A 1% increase in the cost to fulfil start-up procedures lowered entrepreneurship by 0.015% regardless of the state of the economy, contradicting the work of Dyck et al. (2011) which pointed towards no effect of such start-up costs.

9 Conclusions

The analysis conducted here in investigating the changing impact of individual drivers of entrepreneurship over the business cycle is novel. As such, the findings presented in this paper give rise to many questions which cannot be answered by the literature. Despite this, the results of the final model shown in table 1 bring to light some interesting findings.

Firstly, as demonstrated by the statistical significance of many of the interactive "recession" dummy terms, the influence of factors affecting business creation are not constant across the business cycle. Research of the type conducted here can serve an important purpose in informing policy formulation in response to this finding.

As explained in the results section, the model presented here suggests that the focus of government policy and behavioural adjustments aimed at promoting entrepreneurship during economic recessions should concern tax rates for small firms, investor protection, investment bureaucracy and the public perception of the administration. In these areas, the stances recommended here are high levels of tax breaks for start-ups, empowerment of shareholders through increasing director liability, deconstructing barriers to incoming FDI and credibly committing to a stable business environment. During years of growth, however, there may be justifiable cause for a relaxation of these measures in order to serve other government objectives.

In addition, the results suggest ways in which reducing costly government intervention during recession may help lower the burden on public finances with little detriment to entrepreneurship. The partial neutralisation of the negative relationship between small, generic business start-up costs and entrepreneurship supports a reduction of government subsidisation and favourable loans to offset the impact of these obstacles. Somewhat counterintuitive findings such as these, however, would hugely benefit from the confirmation of future research on the topic.

9.1 Limitations of the Model

The use of quarterly data would be a major improvement to the analysis conducted here. The first reason relates to the “recession” dummy variable, which reflected growth over an entire year. This is a blunt indicator of recession, as economies which never technically enter recession can qualify here and vice versa. More accuracy in the “recession” variable would increase the accuracy of the coefficients on “recession” dummy multiplicative terms. Quarterly data would also increase the sample size to 2,304, providing more accurate coefficients and a clear picture of the suitability of the instruments implemented here.

In addition, instrumental variable analysis here was limited by a lack of potential instruments. Extra variables, such as interest rate volatility, may have been suitable instruments and overcome any remaining endogeneity causing the positive sign on *banklendingrate2* in the final IV model. Additional data could have been collected with more time, highlighting a further limitation of the analysis presented.

Finally, the variable used to measure credit availability is flawed. The discrepancy between the results in figure 4 and the hypothesis may be explained by the use of private sector borrowing as a proportion of GDP. Volatile GDP figures during 2004-11 may undermine the accuracy of the variable in reflecting underlying changes in lending volumes. A better variable here would measure private sector borrowing independent of GDP, such as year-on-year borrowing growth.

9.2 Avenues of Future Research

Besides repeating the analysis here using a wider range of variables and a larger sample size, future research could investigate the new questions raised.

This research identified a different change in the deterring effects of start-up costs during periods of growth and recession: some costs became less of a deterrent in recession (*lcostelec* and *lcostregprop*) while others did not. Such variation was not documented in the literature studied, and repeating the analysis here with a broader range of small and large start-up costs could provide a clearer picture of how governments should best respond.

Secondly, investigating the additional negative impact of required transparency (*disclosure*) during recession may inform policy-economists. Earlier, it was mentioned that this effect may be a matter of quality or intimidation for first-time entrepreneurs. However, this finding points towards the importance of identifying how the entrepreneur pool differs in recession and in growth. Findings on this topic may illuminate results found here and guide future research of this type *ex-ante*.

The final potential avenue of future research is to combine export cost and bureaucracy variables with measure of national trade intensity. Such investigation here would have required a triple multiplicative term to show how the marginal effect of export costs and red-tape depend on trade levels and differ along the business cycle. This research would provide more granular policy recommendations.

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Table 1 A summary of the final results from instrumental variable fixed-effects analysis (Instrumental Variable FE) and from regular fixed-effects modelling (FE Model).

Variable	Instrumental Variable FE	Fixed Effects
<i>Banklendingrate2</i>	0.0293	-0.00145
<i>Gdpgrowth</i>	0.0118***	0.00889**
<i>Recession</i>	0.467	0.859*
<i>Lgdpcap</i>	0.466***	0.486***
<i>Ltotaltax</i>	0.356**	0.264
<i>Ltotaltaxsq</i>	-0.0655**	-0.0508*
<i>Lunemp</i>	0.0816***	0.0786**
<i>Lprivcredgdp</i>	-0.420*	-0.473
<i>Lprivcredgdpsq</i>	0.0702**	0.0775
<i>Lsdimpcont</i>	-4.260***	-3.592**
<i>Lsdimpcontsq</i>	0.315***	0.263**
<i>Ldocexpcont</i>	-0.0922	-0.1
<i>Lsdexpcont</i>	4.345**	3.461*
<i>Lsdexpcontsq</i>	-0.321**	-0.254
<i>Investorprot</i>	0.0367**	0.0331
<i>Disclosure</i>	-0.0249**	-0.013
<i>Credinf</i>	-0.034***	-0.0372**
<i>Lcostregprop</i>	-0.0263***	-0.0268***
<i>Ldayselec</i>	0.0690**	0.07
<i>Lcostelec</i>	-0.153***	-0.133**
<i>Lcostelecsq</i>	0.0156***	0.0137**
<i>Procstartbus</i>	-0.00198	-0.00835
<i>Ldaysstartbus</i>	0.128**	0.149*
<i>Ldaysstartbussq</i>	-0.0322***	-0.0359**
<i>Lcoststartbus</i>	-0.0146*	-0.012
<i>Internet</i>	-0.00668***	-0.00565***
<i>Ltradegdp</i>	0.358***	0.38***
<i>Govteff</i>	0.226**	0.201
<i>Recltottax</i>	-0.0952*	-0.122**
<i>Reclprivcred</i>	-0.129*	-0.134*
<i>Reclbusdisc</i>	0.00848	0.00516
<i>Recinvestorprot</i>	0.0795***	0.0865**
<i>Recdisclosure</i>	-0.0534***	-0.0533**
<i>Reccredinf</i>	0.0488*	0.0473***
<i>Reclcostregprop</i>	0.0214**	0.0249**
<i>Reclcostelec</i>	0.0750*	0.0423
<i>Receff</i>	0.162*	0.128
<i>Recldaysstartbus</i>	-0.0587	-0.0514
<i>Reclcoststartbus</i>	0.00424	0.00242
<i>Reclinternet</i>	-0.158*	-0.116**
"Missing" Dummies	Yes	Yes
Yearly Dummies	Yes	Yes
Constant		1.599
Observations	576	576
R-Squared	0.4854	0.5984

* p<0.10, ** p<0.05, ***p<0.01

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Table 2 A summary of the final results from IV analysis excluding outliers reporting extreme levels of corruption.

Variable	IV Excluding Outliers
<i>Banklendingrate2</i>	0.036
<i>Gdpgrowth</i>	0.0135**
<i>Recession</i>	0.407
<i>Lgdpicap</i>	0.512***
<i>Ltotaltax</i>	0.323*
<i>Ltotaltaxsq</i>	-0.058*
<i>Lunemp</i>	0.061**
<i>Lprivcredgdp</i>	0.201
<i>Lprivcredgdpsq</i>	-0.0139
<i>Lusdimpcont</i>	-3.987***
<i>Lusdimpcontsq</i>	0.291**
<i>Ldocexpcont</i>	-0.132**
<i>Lusdexpcnt</i>	4.061**
<i>Lusdexpcntsq</i>	-0.297**
<i>Investorprot</i>	0.0328*
<i>Disclosure</i>	-0.0225*
<i>Credinf</i>	-0.0338**
<i>Lcostregprop</i>	-0.0206***
<i>Ldayselec</i>	0.0341
<i>Lcostelec</i>	-0.143***
<i>Lcostelecsq</i>	0.0148***
<i>Procstartbus</i>	-0.0285*
<i>Ldaysstartbus</i>	0.161***
<i>Ldaysstartbussq</i>	-0.0368***
<i>Lcoststartbus</i>	-0.000262
<i>Internet</i>	-0.00546***
<i>Ltradegdp</i>	0.458***
<i>Govteff</i>	0.235**
<i>Recltottax</i>	-0.0753
<i>Reclprivcred</i>	-0.0934
<i>Reclbusdisc</i>	0.0055
<i>Recinvestorprot</i>	0.0775***
<i>Recdisclosure</i>	-0.0458***
<i>Reccredinf</i>	0.0504**
<i>Reclcostregprop</i>	0.0185*
<i>Reclcostelec</i>	0.0602
<i>Receff</i>	0.158**
<i>Recldaysstartbus</i>	-0.0286
<i>Reclcoststartbus</i>	0.00267
<i>Reclinternet</i>	-0.176*
"Missing" Dummies	Yes
Yearly Dummies	Yes
Observations	557
R-Squared	0.46212

* p<0.10, ** p<0.05, ***p<0.01

Figure 2 Taxes were more of a deterrent to business creation during years of recession.

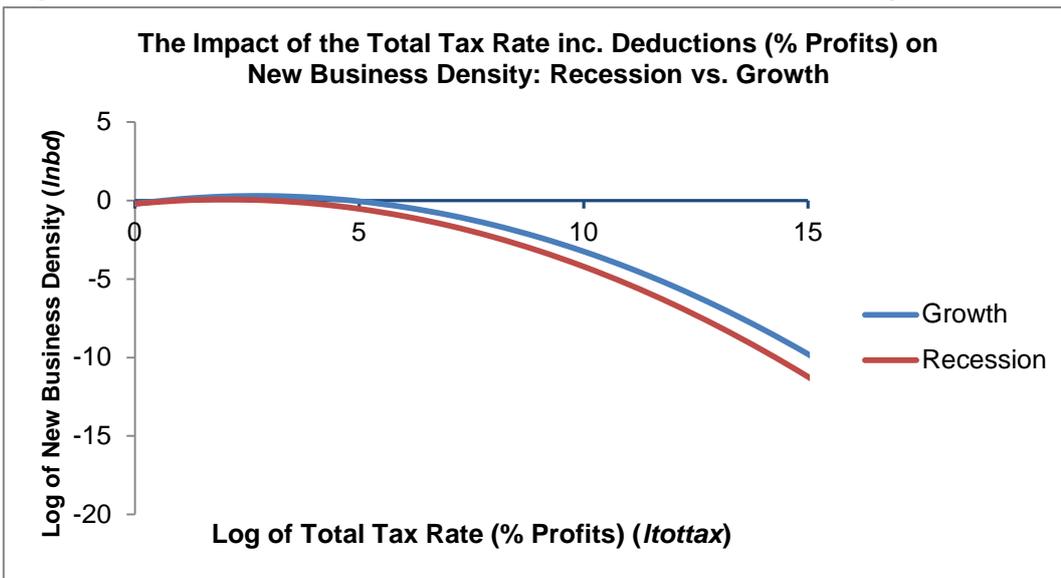


Figure 3 Electricity acquisition costs were less of a deterrent to business creation during recession.

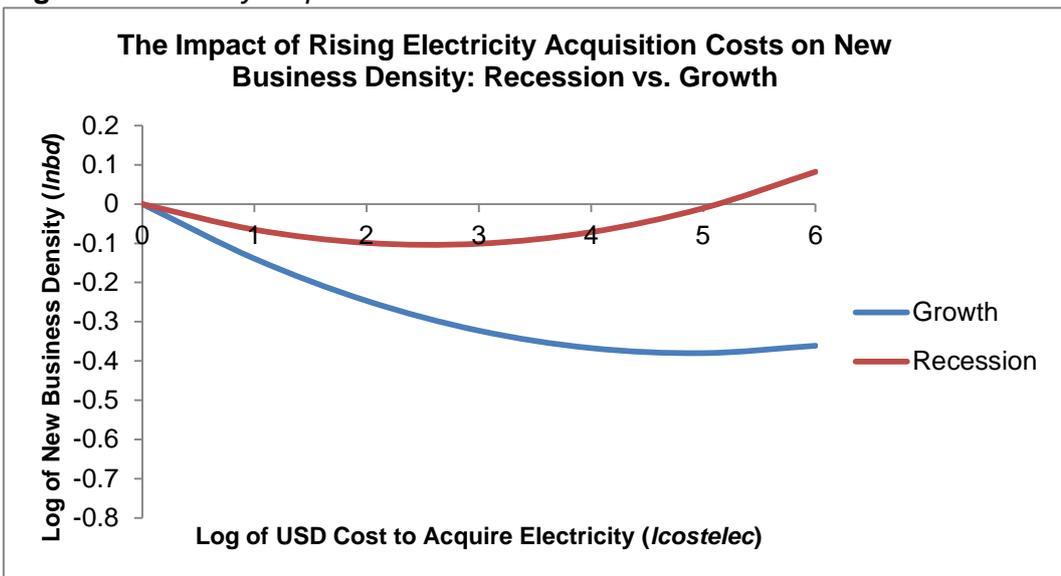


Figure 4 The final IV model (table 1) shows private sector credit as a restraint on entrepreneurship.

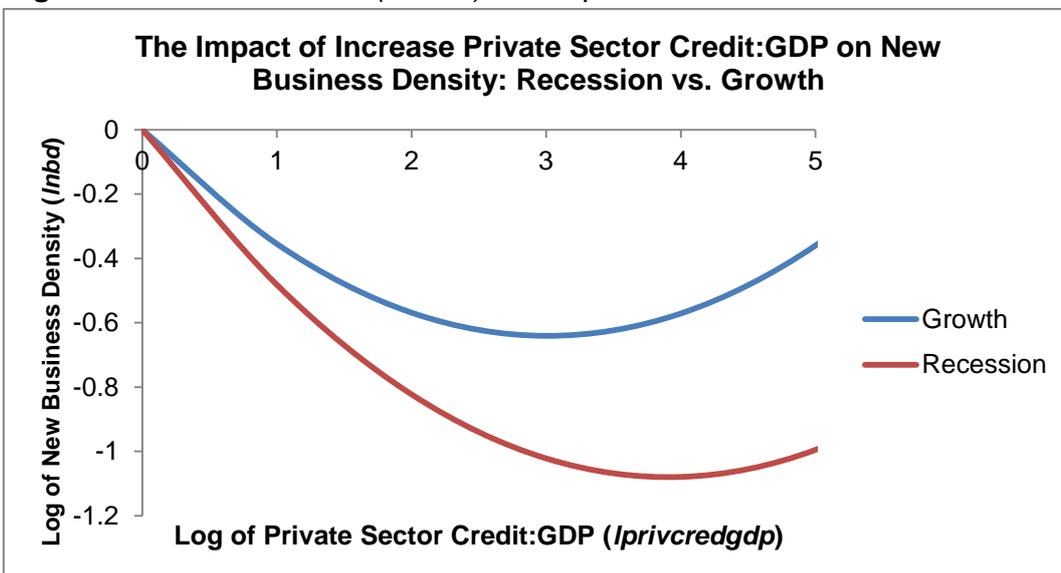


Figure 5 Removing outliers with extremely high corruption yielded the IV model in table 2 showing an upward-sloping relationship between private sector credit and entrepreneurship.

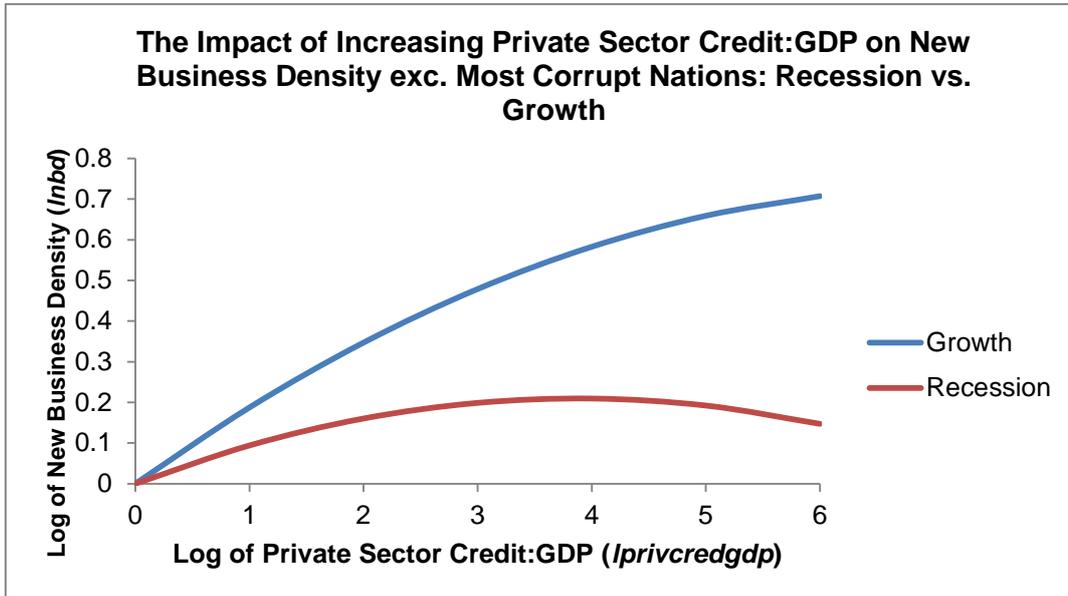
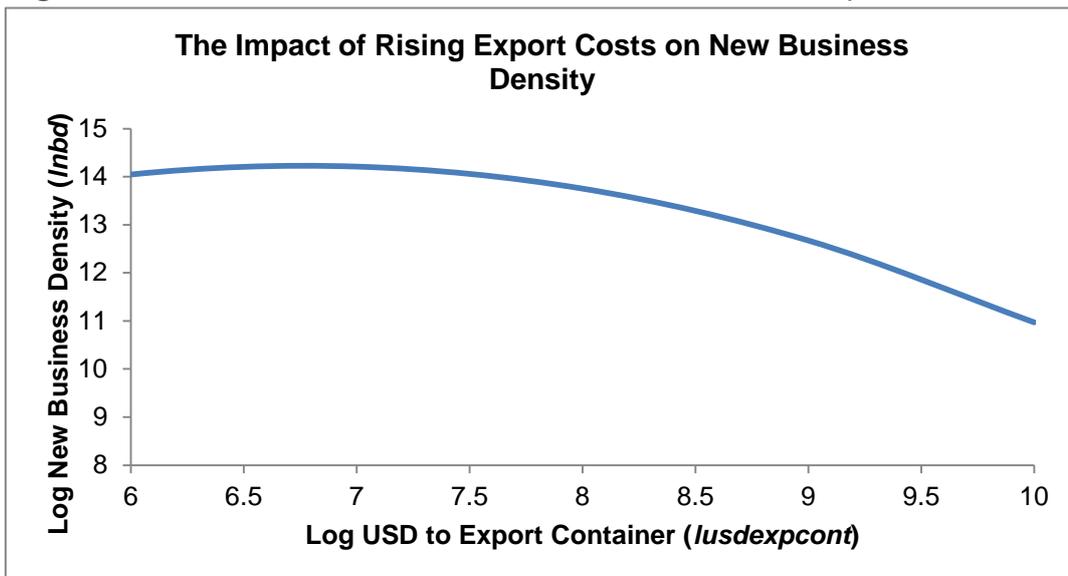


Figure 6 Business creation deterrence increases in container export costs.



Appendix

A1 Summary statistics of all variable used.

<i>Variable</i>	<i>Obs.</i>	<i>Mean</i>	<i>S.D.</i>	<i>Min</i>	<i>Max</i>
<i>Inbd</i>	576	.3984	1.5762	-5.1685	3.6636
<i>gdpgrowth</i>	576	4.0869	4.5637	-18	46.5
<i>banklendingrate2</i>	576	11.186	6.6166	.5	55.383
<i>ler</i>	576	2.14	2.3361	-1.1658	9.2482
<i>cpi</i>	576	5.249	5.3141	-13.2	53.2
<i>recession</i>	576	.11806	.32295	0	1
<i>lgdpcap</i>	576	9.0288	1.4127	5.3941	11.504
<i>ltotaltax</i>	576	3.6334	.47937	1.0296	4.5633
<i>ltotaltaxsq</i>	576	13.431	3.1523	1.0601	20.824
<i>lunemp</i>	576	1.916	.50352	-1.204	3.3534
<i>lurbpop</i>	576	4.1232	.3815	2.9907	4.6052
<i>lurbpopsq</i>	576	17.146	2.981	8.9444	21.208
<i>lprivcredgdp</i>	576	3.995	.85562	.58779	5.6984
<i>lprivcredgdpsq</i>	576	16.691	6.5395	.34549	32.472
<i>lcombankdens</i>	576	2.8423	.84849	-1.204	4.8371
<i>lcombankdenssq</i>	576	8.7973	4.4887	0	23.397
<i>lbusdisc</i>	576	1.071	3.0466	-16.118	2.3026
<i>lusdimpcont</i>	576	7.0622	.45192	5.7589	8.4446
<i>lusdimpcontsq</i>	576	50.079	6.4184	33.165	71.312
<i>ldocexpcont</i>	576	1.6808	0.3485	0.6931	2.5649
<i>lusdexpccont</i>	576	6.9464	.42914	5.687	8.3629
<i>lusdexpccontsq</i>	576	48.436	6.0453	32.342	69.938
<i>investorprot</i>	576	5.3746	1.4968	1	9.7
<i>disclosure</i>	576	5.3325	2.3589	0	10
<i>credinf</i>	576	3.6879	1.9168	0	6
<i>lcostregprop</i>	576	1.0756	2.0864	-16.118	3.4275
<i>ldayselec</i>	576	4.6053	.3503	2.8332	6.0497
<i>lcostelec</i>	576	6.1347	1.0014	.58779	8.7738
<i>lcostelecsq</i>	576	38.635	9.9855	.34549	76.979
<i>procstartbus</i>	576	8.1107	3.5875	1	28
<i>ldaysstartbus</i>	576	3.0505	.93457	-.69315	5.3083
<i>ldaysstartbussq</i>	576	10.178	5.588	.48045	28.178
<i>lcoststartbus</i>	576	1.986	2.82	-16.118	6.0292
<i>lpaidincapbus</i>	576	-4.1936	9.6216	-16.118	8.5393
<i>lpaidincapbussq</i>	576	110	120.38	.00908	259.79
<i>internet</i>	576	38.184	27.818	.1	94
<i>ltradegdp</i>	576	4.1965	.52165	2.8736	5.9626
<i>govteff</i>	576	.48872	1.0078	-1.8	2.4
<i>regquality</i>	576	.44635	.98053	-1.7	2
<i>rol</i>	576	.34878	1.0684	-2	2
<i>recltottax</i>	576	.42973	1.1885	0	4.5185
<i>reclprivcred</i>	576	.51648	1.4407	0	5.5973
<i>reclcombank</i>	576	.37516	1.0546	0	4.6913
<i>reclbusdisc</i>	576	.16499	.88225	-16.118	2.3026

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<i>recinvestorprot</i>	576	.69166	1.9695	0	9.7
<i>recdisclosure</i>	576	.69155	2.1039	0	10
<i>reccredinf</i>	576	.46886	1.4429	0	6
<i>reclcostregprop</i>	576	.10739	.86607	-16.118	2.7279
<i>reclcostelec</i>	576	.74662	2.0522	0	8.2778
<i>receff</i>	576	.09688	.41054	-1.7	2.3
<i>recldaysstartbus</i>	576	.32216	.92935	0	5.3083
<i>reclcoststartbus</i>	576	.12045	1.2116	-16.118	6.0292
<i>reclinternet</i>	576	.44201	1.2439	-.10536	4.5229
<i>gdpgrowthmiss</i>	576	.01563	.12413	0	1
<i>lgdpcapmiss</i>	576	.00174	.04167	0	1
<i>ltotaltaxmiss</i>	576	.20313	.40267	0	1
<i>lunempmiss</i>	576	.21875	.41376	0	1
<i>lprivcredgdpmiss</i>	576	.04688	.21155	0	1
<i>lcombankdensmiss</i>	576	.05208	.22239	0	1
<i>lbusdiscmiss</i>	576	.1441	.35149	0	1
<i>lusdimpcontmiss</i>	576	.2691	.44388	0	1
<i>credinfmiss</i>	576	.15451	.36175	0	1
<i>lcostregpropmiss</i>	576	.15625	.36341	0	1
<i>ldayselecmiss</i>	576	.75347	.43136	0	1
<i>procstartbusmiss</i>	576	.0434	.20394	0	1
<i>linternetmiss</i>	576	.00694	.08312	0	1
<i>lendingmiss</i>	576	.22569	.4184	0	1
<i>yr2005</i>	576	.125	.33101	0	1
<i>yr2006</i>	576	.125	.33101	0	1
<i>yr2007</i>	576	.125	.33101	0	1
<i>yr2008</i>	576	.125	.33101	0	1
<i>yr2009</i>	576	.125	.33101	0	1
<i>yr2010</i>	576	.125	.33101	0	1
<i>yr2011</i>	576	.125	.33101	0	1

A2 Description of all variables used.

<i>Variable</i>	<i>Variable Description</i>
<i>lnbd</i>	The log of “New Business Density”: a World Bank measure reflecting the new business registrations per 1,000 people aged 15-64.
<i>gdpgrowth</i>	The GDP growth rate.
<i>banklendingrate2</i>	The average bank interest rate charged on medium-term borrowing of the private sector.
<i>ler</i>	The log of the exchange rate, expressed as the number of local currency units per US dollar.
<i>cpi</i>	The consumer price index.
<i>recession</i>	A dummy variable: =1 if the economy recorded negative growth over the year, and =0 otherwise.
<i>lgdpcap</i>	The log of GDP per capita.
<i>ltotaltax</i>	The log of the total tax rate. The total tax rate measures the percentage of commercial profits paid as taxes, allowing for any exemptions.
<i>ltotaltaxsq</i>	The squared variable of <i>ltotaltax</i> .
<i>lunemp</i>	The log of the unemployment rate.
<i>lurbpop</i>	The log of the percentage of the population living in urban areas.
<i>lurbpopsq</i>	The squared variable of <i>lurbpop</i> .
<i>lprivcredgdp</i>	The log of the financial resources provided to the private sector by financial institutions as a percentage of GDP. These financial resources include loans, purchases of nonequity securities and trade credits.
<i>lprivcredgdpsq</i>	The squared variable of <i>lprivcredgdp</i> .
<i>lcombankdens</i>	The log of the number of commercial bank branches per 100,000 adults.
<i>lcombankdenssq</i>	The squared variable of <i>lcombankdens</i> .
<i>lbusdisc</i>	The log of the score in the World Bank’s Business Extent of Disclosure Index, measuring the required disclosure of ownership and financial information. The index ranges from 0-10, with higher values reflecting more disclosure.
<i>lusdimpcont</i>	The log of the US dollar value of all fees (administrative, customs clearance, customs brokers, handling charges etc) to import a 20-foot container.
<i>lusdimpcontsq</i>	The squared variable of <i>lusdimpcont</i> .
<i>ldocexpcont</i>	The log of the number of documents required per shipment to export goods.
<i>lusedexpcont</i>	The log of the US dollar value of all fees (administrative, customs clearance, customs brokers, handling charges etc) to export a 20-foot container.
<i>lusedexpcontsq</i>	The squared variable of <i>lusedexpcont</i> .
<i>investorprot</i>	A World Bank indicator of investor protection, which reflects the strength of shareholder protection against the misuse of corporate assets by directors (0-10). This considers director liability and shareholders’ ability to sue directors.
<i>disclosure</i>	A World Bank composite measure of director transparency (0-10).
<i>credinf</i>	A World Bank indicator measuring the required quantity and quality of credit information through public or private credit agencies (0-6).
<i>lcostregprop</i>	The log of official costs to register property as a proportion of property value.
<i>ldayselec</i>	The log of the number of days to obtain a permanent electricity connection.
<i>lcostelec</i>	The log of the average cost of establishing a permanent electricity connection, expressed as a percentage of GDP/capita.

<i>lcostelecsq</i>	The squared variable of <i>lcostelec</i> .
<i>procstartbus</i>	The number of procedures formally required to establish a new business.
<i>ldaysstartbus</i>	The log of the average number of days required to completely fulfil formal procedures for establishing a business.
<i>ldaysstartbussq</i>	The squared variable of <i>ldaysstartbus</i> .
<i>lcoststartbus</i>	The log of the cost of official fees, fees for legal/professional services in starting a business, expressed as a percentage of GDP/capita.
<i>lpaidincapbus</i>	The log of the value of required minimum capital deposited in a company bank account during firm registration, as a percentage of GDP/capita.
<i>lpaidincapbussq</i>	The squared variable of <i>lpaidincapbus</i> .
<i>internet</i>	The number of individuals with access to the internet per 100 people.
<i>ltradegdp</i>	The log of merchandise trade as a share of GDP.
<i>govteff</i>	A World Bank Governance Indicator capturing perceptions of the quality of policy, the credibility of government commitment to suitable policies and the removal of excessive red tape in areas such as incoming FDI.
<i>regquality</i>	A World Bank Governance Indicator capturing perceptions of government formulation and implementation of regulations to promote private sector development.
<i>rol</i>	A World Bank Governance Indicator capturing perceptions of the application of the rule of law.
<i>recltottax</i>	A multiplicative term combining the recession dummy with <i>ltottax</i> .
<i>reclprivcred</i>	A multiplicative term combining the recession dummy with <i>lprivcredgdp</i> .
<i>reclcombank</i>	A multiplicative term combining the recession dummy with <i>lcombankdens</i> .
<i>reclbusdisc</i>	A multiplicative term combining the recession dummy with <i>lbusdisc</i> .
<i>recinvestorprot</i>	A multiplicative term combining the recession dummy with <i>investorprot</i> .
<i>recldisclosure</i>	A multiplicative term combining the recession dummy with <i>disclosure</i> .
<i>reccredinf</i>	A multiplicative term combining the recession dummy with <i>credinf</i> .
<i>reclcostregprop</i>	A multiplicative term combining the recession dummy with <i>costregprop</i> .
<i>reclcostelec</i>	A multiplicative term combining the recession dummy with <i>lcostelec</i> .
<i>recaff</i>	A multiplicative term combining the recession dummy with <i>govteff</i> .
<i>recldaysstartbus</i>	A multiplicative term combining the recession dummy with <i>ldaysstartbus</i> .
<i>reclcoststartbus</i>	A multiplicative term combining the recession dummy with <i>lcoststarbus</i> .
<i>reclinternet</i>	A multiplicative term combining the recession dummy with <i>internet</i> .
<i>gdpgrowthmiss</i>	A dummy variable to account for mean replacement: =1 if the observation was originally missing a value for <i>gdpgrowth</i> , and =0 otherwise.
<i>lgdpcapmiss</i>	A dummy variable to account for mean replacement: =1 if the observation was originally missing a value for <i>lgdpcap</i> , and =0 otherwise.
<i>ltotaltaxmiss</i>	A dummy variable to account for mean replacement: =1 if the observation was originally missing a value for <i>ltotaltax</i> , and =0 otherwise.
<i>lunempmiss</i>	A dummy variable to account for mean replacement: =1 if the observation was originally missing a value for <i>lunemp</i> , and =0 otherwise.
<i>lprivcredgdpmiss</i>	A dummy variable to account for mean replacement: =1 if the observation was originally missing a value for <i>lprivcredgdp</i> , and =0 otherwise.
<i>lcombankdensmiss</i>	A dummy variable to account for mean replacement: =1 if the observation was originally missing a value for <i>lcombankdens</i> , and =0 otherwise.
<i>lbusdiscmiss</i>	A dummy variable to account for mean replacement: =1 if the observation was originally missing a value for <i>lbusdisc</i> , and =0 otherwise.
<i>lusdimpcontmiss</i>	A dummy variable to account for mean replacement: =1 if the observation was originally missing a value for <i>lusdimpcont</i> , and =0 otherwise.

<i>credinfmiss</i>	A dummy variable to account for mean replacement: =1 if the observation was originally missing a value for <i>credinf</i> , and =0 otherwise.
<i>lcostregpropmiss</i>	A dummy variable to account for mean replacement: =1 if the observation was originally missing a value for <i>lcostregprop</i> , and =0 otherwise.
<i>ldayselecmiss</i>	A dummy variable to account for mean replacement: =1 if the observation was originally missing a value for <i>ldayselec</i> , and =0 otherwise.
<i>procstartbusmiss</i>	A dummy variable to account for mean replacement: =1 if the observation was originally missing a value for <i>procstartbus</i> , and =0 otherwise.
<i>linternetmiss</i>	A dummy variable to account for mean replacement: =1 if the observation was originally missing a value for <i>internet</i> , and =0 otherwise.
<i>lendingmiss</i>	A dummy variable to account for mean replacement: =1 if the observation was originally missing a value for <i>banklendingrate2</i> , and =0 otherwise.
<i>yr2005</i>	A dummy variable: =1 if the observation was in 2005, and =0 otherwise.
<i>yr2006</i>	A dummy variable: =1 if the observation was in 2006, and =0 otherwise.
<i>yr2007</i>	A dummy variable: =1 if the observation was in 2007, and =0 otherwise.
<i>yr2008</i>	A dummy variable: =1 if the observation was in 2008, and =0 otherwise.
<i>yr2009</i>	A dummy variable: =1 if the observation was in 2009, and =0 otherwise.
<i>yr2010</i>	A dummy variable: =1 if the observation was in 2010, and =0 otherwise.
<i>yr2011</i>	A dummy variable: =1 if the observation was in 2011, and =0 otherwise.

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A3 All results and standard errors from the three models.

Variable	IV Fixed Effects		Fixed Effects		IV exc. Outliers	
<i>banklendingrate2</i>	0.0293	(0.0207)	-0.00145	(0.0044)	0.036	(0.0242)
<i>gdpgrowth</i>	0.0118***	(0.0045)	0.00889**	(0.0043)	0.0135**	(0.0060)
<i>recession</i>	0.467	(0.5768)	0.859*	(0.4749)	0.407	(0.5367)
<i>lgdpcap</i>	0.466***	(0.1075)	0.486***	(0.1489)	0.512***	(0.1146)
<i>ltotaltax</i>	0.356**	(0.1714)	0.264	(0.1779)	0.323*	(0.1828)
<i>ltotaltaxsq</i>	-0.0655**	(0.0307)	-0.0508*	(0.0295)	-0.0580*	(0.0322)
<i>lunemp</i>	0.0816***	(0.0305)	0.0786**	(0.0347)	0.0661**	(0.0313)
<i>lurbpop</i>	-7.507	(6.4314)	-3.795	(7.1550)	-4.843	(6.5794)
<i>lurbpopsq</i>	1.116	(0.8860)	0.501	(0.9377)	0.535	(0.8737)
<i>lprivcredgdp</i>	-0.420*	(0.2431)	-0.473	(0.3689)	0.201	(0.3264)
<i>lprivcredgdpsq</i>	0.0702**	(0.0346)	0.0775	(0.0509)	-0.0139	(0.0441)
<i>lcombankdens</i>	0.244	(0.1662)	0.371	(0.2459)	0.322	(0.3159)
<i>lcombankdenssq</i>	-0.000108	(0.0349)	-0.0325	(0.0473)	-0.0152	(0.0567)
<i>lbusdisc</i>	0.00940*	(0.0048)	0.0102***	(0.0036)	0.0109**	(0.0052)
<i>lusdimpcont</i>	-4.260***	(1.4915)	-3.592**	(1.5031)	-3.987	(1.5276)
<i>lusdimpcontsq</i>	0.315***	(0.1133)	0.263**	(0.1140)	0.291**	(0.1163)
<i>ldocexpcont</i>	-0.0922	(0.0617)	-0.1	(0.0667)	-0.132	(0.0617)
<i>lusdexpccont</i>	4.345**	(1.9068)	3.461*	(2.0059)	4.061**	(1.9629)
<i>lusdexpccontsq</i>	-0.321**	(0.1441)	-0.254	(0.1530)	-0.297**	(0.1481)
<i>investorprot</i>	0.0367**	(0.0185)	0.0331	(0.0215)	0.0328*	(0.0180)
<i>disclosure</i>	-0.0249**	(0.0126)	-0.013	(0.0135)	-0.0225*	(0.0118)
<i>credinf</i>	-0.0340***	(0.0130)	-0.0372**	(0.0156)	-0.0338**	(0.0133)
<i>lcostregprop</i>	-0.0263***	(0.0086)	-0.0268***	(0.0090)	-0.0206***	(0.0078)
<i>ldayselec</i>	0.0690**	(0.0327)	0.07	(0.0450)	0.0341	(0.0331)
<i>lcostelec</i>	-0.153***	(0.0522)	-0.133**	(0.0609)	-0.143	(0.0524)
<i>lcostelecsq</i>	0.0156***	(0.0055)	0.0137**	(0.0065)	0.0148***	(0.0055)
<i>procstartbus</i>	-0.00198	(0.0129)	-0.00835	(0.0159)	-0.0285	(0.0156)
<i>ldaysstartbus</i>	0.128**	(0.0519)	0.149*	(0.0795)	0.161***	(0.0486)
<i>ldaysstartbussq</i>	-0.0322***	(0.0106)	-0.0359**	(0.0149)	-0.0368***	(0.0100)
<i>lcoststartbus</i>	-0.0146*	(0.0076)	-0.012	(0.0082)	-0.000262	(0.0077)
<i>lpaidincapbus</i>	-0.0271*	(0.0149)	-0.0308**	(0.0151)	-0.0214	(0.0158)
<i>lpaidincapbussq</i>	-0.00185	(0.0011)	-0.00210*	(0.0011)	-0.00174	(0.0012)
<i>internet</i>	0.00668***	(0.0018)	-0.0057***	(0.0019)	-0.00546***	(0.0018)
<i>ltradegdp</i>	0.358***	(0.1095)	0.380***	(0.1131)	0.458***	(0.1089)
<i>govteff</i>	0.226**	(0.0928)	0.201	(0.1249)	0.235**	(0.0933)
<i>regquality</i>	0.0855	(0.0881)	0.0873	(0.1085)	-0.0123	(0.0913)
<i>rol</i>	-0.236	(0.1581)	-0.351**	(0.1569)	-0.232*	(0.1371)
<i>recltottax</i>	-0.0952*	(0.0568)	-0.122**	(0.0576)	-0.0753	(0.0588)
<i>reclprivcred</i>	-0.129*	(0.0716)	-0.134*	(0.0713)	-0.0934	(0.0717)
<i>reclcombank</i>	0.0485	(0.0506)	0.0308	(0.0451)	0.0215	(0.0464)
<i>reclbusdisc</i>	0.00848	(0.0066)	0.00516	(0.0062)	0.0055	(0.0062)
<i>recinvestorprot</i>	0.0795***	(0.0287)	0.0865**	(0.0379)	0.0775***	(0.0290)
<i>recdisclosure</i>	-0.0534***	(0.0156)	-0.0533**	(0.0218)	-0.0458***	(0.0160)
<i>reccredinf</i>	0.0488**	(0.0195)	0.0473***	(0.0176)	0.0504**	(0.0204)

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<i>reclcostregprop</i>	0.0214**	(0.0108)	0.0249**	(0.0095)	0.0185*	(0.0104)
<i>reclcostelec</i>	0.0750*	(0.0446)	0.0423	(0.0331)	0.0602	(0.0371)
<i>receff</i>	0.162*	(0.0825)	0.128	(0.0789)	0.158**	(0.0805)
<i>recldaysstartbus</i>	-0.0587	(0.0456)	-0.0514	(0.0407)	-0.0286	(0.0458)
<i>reclcoststartbus</i>	0.00424	(0.0095)	0.00242	(0.0047)	0.00267	(0.0091)
<i>reclinternet</i>	-0.158*	(0.0952)	-0.166**	(0.0720)	-0.176*	(0.0973)
<i>gdpgrowthmiss</i>	-0.141	(0.1323)	-0.0387	(0.1072)	-0.173	(0.1432)
<i>lgdpcapmiss</i>	-0.880**	(0.3847)	-1.142***	(0.3181)	-1.026***	(0.3695)
<i>ltotaltaxmiss</i>	0.142**	(0.0585)	0.163***	(0.0571)	0.102	(0.0625)
<i>lunempmiss</i>	-0.146***	(0.0505)	-0.137**	(0.0641)	-0.109**	(0.0512)
<i>lprivcredgdpmiss</i>	-0.093	(0.1041)	-0.0889	(0.1164)	-0.175	(0.1095)
<i>lcombankdensmiss</i>	0.108*	(0.0641)	0.156**	(0.0684)	0.108	(0.0678)
<i>lbusdiscmiss</i>	0.0375	(0.0926)	0.0432	(0.0864)	0.0509	(0.0959)
<i>lusdimpcontmiss</i>	0.11	(0.1005)	0.128	(0.1471)	0.144	(0.1081)
<i>credinfmiss</i>	-0.258	(0.3927)	0.05	(0.3257)	-0.0599	(0.1091)
<i>lcostregpropmiss</i>	0.193	(0.3542)	-0.0775	(0.2839)		
<i>ldayselecmiss</i>	0.0429	(0.1033)	0.0227	(0.0822)	0.0729	(0.1023)
<i>procstartbusmiss</i>	0.357***	(0.1371)	0.301*	(0.1767)	0.245*	(0.1482)
<i>linternetmiss</i>	-0.165	(0.1593)	-0.128	(0.1432)	-0.182	(0.1693)
<i>lendingmiss</i>	-0.131	(0.1286)	0.03	(0.0663)	-0.134	(0.1447)
<i>yr2005</i>	0.00289	(0.1303)	0.0285	(0.0816)	0.0133	(0.1418)
<i>yr2006</i>	0.118	(0.1284)	0.151	(0.1674)	0.138	(0.1364)
<i>yr2007</i>	0.142	(0.1344)	0.178	(0.1753)	0.161	(0.1409)
<i>yr2008</i>	0.116	(0.1380)	0.159	(0.1798)	0.121	(0.1424)
<i>yr2009</i>	0.183	(0.1466)	0.205	(0.1831)	0.218	(0.1508)
<i>yr2010</i>	0.174	(0.1793)	0.153	(0.1656)	0.245	(0.1809)
<i>yr2011</i>	0.139	(0.1882)	0.112	(0.1789)	0.2	(0.1862)
<i>constant</i>			1.599	(11.5716)		
Observations	576		576		557	
R-squared	0.4854		0.5984		0.4621	

Robust standard errors in parentheses

* p<0.10, ** p<0.05, *** p<0.01

A4 Relevant tests of the suitability of instrumental variable analysis in the final IV model.

Final IV Model:

Regressors tested: <i>banklendingrate2</i>	
Underidentification Test (Kleibergen-Paap rk LM statistic):	13.903
Chi-sq(2) P-val =	0.001
Hansen J statistic (overidentification test of all instruments):	0.085
Chi-sq(1) P-val =	0.7702
Endogeneity test of endogenous regressors:	2.843
Chi-sq(1) P-val =	0.0918

A5 Relevant tests of the suitability of instrumental variable analysis in the IV model when outliers are excluded.

Final IV Model exc. Outliers

Regressors tested: <i>banklendingrate2</i>	
Underidentification Test (Kleibergen-Paap rk LM statistic):	14.188
Chi-sq(2) P-val =	0.0008
Hansen J statistic (overidentification test of all instruments):	0.452
Chi-sq(1) P-val =	0.5015
Endogeneity test of endogenous regressors:	3.368
Chi-sq(1) P-val =	0.0665

A6 Instrument Relevance Test: joint F-statistic for *ler* and *cpi* with *banklendingrate2* as dependent variable. Null hypothesis is of joint insignificance of both variables.

F (2,432) = 10.97
 Prob > F = 0.0000

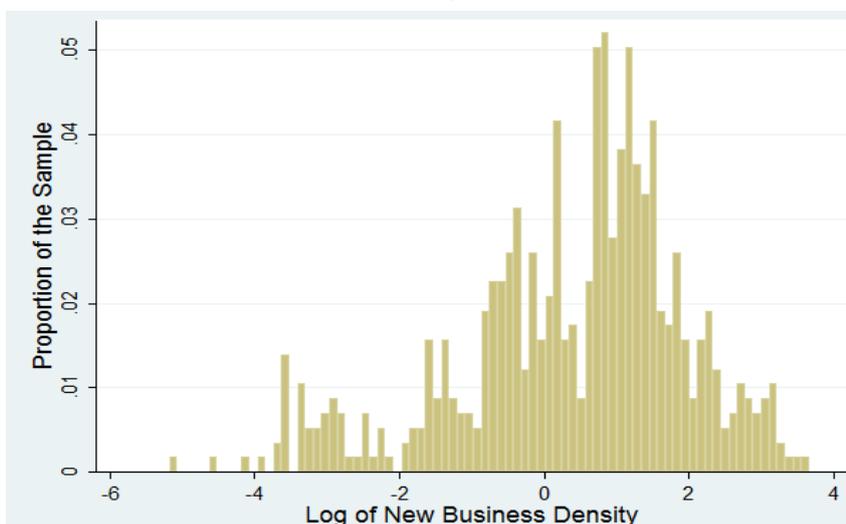
A7 Hausman Test: null hypothesis that the difference in coefficients resulting from identical random effects and fixed effects models are not systematic.

Chi2(91) = (b-B)'[V_b-V_B]^(-1)](b-B) = 282.17
 Prob>chi2 = 0.0000

A8 Modified Wald Test: null hypothesis of homoscedasticity in the fixed effects model. Rejection justifies the use of robust standard errors.

Chi2(72) = 6826.34
 Prob>chi2 = 0.0000

A9 The distribution of *lnbd*, the dependent variable.



Bibliography

- Baumol, W. J. (2007), "Small Firms: Why Market-Driven Innovation Can't Get Along Without Them", Paper presented at IFN Conference, Stockholm, September.
- Congregado, E., Golpe, A, Parker, S. (2009) "The Dynamics of Entrepreneurship: Hysteresis, Business Cycles and Government Policy", Institute for the Study of Labour, Germany, D.P. 4093
- Dyck, A., Ovaska, T. (2011) "Business Environment and New Firm Creation: An International Comparison", *Journal of Small Business and Entrepreneurship*, Vol. 24, Issue 3., pp. 301-17
- Estrin, S., Prevezer, M. (2010) "A Survey on Institutions and New Firm Entry: How and Why do Entry Rates Differ in Emerging Markets?", *Economic Systems*, Vol. 34, Issue 3, pp. 289-308
- International Monetary Fund. (2013). *World Economic Outlook Database*. Available: <http://www.imf.org/external/pubs/ft/weo/2013/02/weodata/index.aspx>. Last accessed 2nd Dec 2013.
- Kelley, D., Singer, S., Herrington, M. (2011) "2011 Global Report", *The Global Entrepreneurship Monitor*, Volume 1
- Klapper, L., Laeven, L., Rajan, R. (2004) "Business Environment and Firm Entry: Evidence from International Data", *CEPR Discussion Papers* 4366, USA
- Koellinger, P., Thurik, R. (2009) "Entrepreneurship and the Business Cycle", *Review of Economics and Statistics*, USA, Vol. 94, pp. 1143-1156.
- Kosi, T., Bojnec, S. (2013) "Institutional Barriers to Business Entry in Advanced Economies", *Journal of Business Economics and Management*, Slovenia
- Levie, J., Autio, E. (2010) "Regulatory Burden, Rule of Law, and Entry of Strategic Entrepreneurs: An International Panel Study", *Journal of Management Studies*, United Kingdom
- Massenot, B., Straub, S.. (2011). "Informal Sector and Economic Growth: The Supply of Credit Channel", *IDEL Working Papers*, France, 685 (1), 17-28.
- Papaikononou, E., Segara, P., Li, X (2011) "Entrepreneurship in the Context of Crisis: Identifying Barriers and Proposing Strategies", *International Atlantic Economic Society*, Spain
- Stangler, D. (2009) "The Economic Future Just Happened", *Ewing Marion Kauffman Foundation*, USA
- Stel, A. van, Carree, M. and Thurik, A.R. (2005), "The effect of entrepreneurial activity on national economic growth", *Small Business Economics*, Vol. 24, pp. 311-21.
- World Bank. (2013). *Doing Business Reports*. Available: <http://www.doingbusiness.org/data>. Last accessed 2nd Dec 2013
- World Bank. (2013). *Governance Indicators*. Available: <http://databank.worldbank.org/data/views/variableselection/selectvariables.aspx?source=worldwide-governance-indicators>. Last accessed 2nd Dec 2013.
- World Bank. (2013). *World Bank DataBank*. Available: <http://databank.worldbank.org/data/home.aspx>. Last accessed 2nd Dec 2013.