

Empirical Study

Determinants of economic growth



Plan

Introduction

Data description

Modelling

Conclusion

Introduction



- * Economic growth = key concept
- * Importance of non-economic parameters

Data description

- * Collected from World Bank database
- * 58 countries
- * Year 2005
- * 13 parameters

Data description

- * Dependent variable

➡ Gross Domestic Product (GDP) growth

Explanatory variables

- Economic
- Political
- Technological

Data description

* Economic variables

- Inflation
- Unemployment
- Foreign direct investment
- Market capitalisation

Data description

* Political variables

- Political stability
- Rule of law
- Control of corruption
- Expense
- Tax revenue

Data description

* Technological variables

- R&D expenditure
- Searchers in R&D
- Internet users
- High technology exports

Modelling

- * *GDP growth function using ordinary least squares*

GDP_{growth}

$$\begin{aligned} &= \beta_0 + \beta_1 \text{Marke_capital} + \beta_2 \text{corrup} \\ &+ \beta_3 \text{expense} + \beta_4 \text{foreign_inv} + \beta_5 \text{high_tech} \\ &+ \beta_6 \text{inflation} + \beta_7 \text{internet} + \beta_8 \text{rd_expend} \\ &+ \beta_9 \text{searchers} + \beta_{10} \text{rule} + \beta_{11} \text{stab} + \beta_{12} \text{tax} \\ &+ \beta_{13} \text{unemploy} \end{aligned}$$

Modelling

* *Linear regression output*

* $GDP_{growth} =$
 $6.1 + 1.99Market_{capital} + 0.03corrup -$
 $0.04expense + 0.16foreign_{inv} - 9.42high_{tech} +$
 $0.03inflation - 0.02internet - 1.49rd_{expend} +$
 $0.003searchers + 0.2rule - 0.2stab + 0.05tax +$
 $0.02unemploy$

Modelling

* Increase of inflation, corruption, unemployment

➔ increase of GDP_growth ?

* Increase of foreign investment, searchers and rule

of la ➔ increase of GDP_growth


Modelling

* Correlation matrix

	FOREIGN_INV EST	HIGH_TECH	INTERNET	RESEARCH_D VPT_EXPEN DITUR	RESEARCH RS	RULE	STAB
FOREIGN_INV EST	1.000000	0.150906	0.284694	0.187486	0.240486	0.290821	0.333625
HIGH_TECH	0.150906	1.000000	0.253038	0.293719	0.161915	0.199337	0.087371
INTERNET	0.284694	0.253038	1.000000	0.791605	0.869757	0.871923	0.817937
RESEARCH_D VPT_EXPEN DITUR	0.187486	0.293719	0.791605	1.000000	0.889336	0.731866	0.641099
RESEARCH RS	0.240486	0.161915	0.869757	0.889336	1.000000	0.773382	0.737911
RULE	0.290821	0.199337	0.871923	0.731866	0.773382	1.000000	0.900809
STAB	0.333625	0.087371	0.817937	0.641099	0.737911	0.900809	1.000000

Modelling

- * Internet users correlated with researchers and stability of the country: linked to democracy
- * Strong correlation between the number of researchers and rule
- * As expected, rule and stab are strongly correlated

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- * R-squared is equal to 0.54
 - * P-values of 0.89 for inflation, may not be relevant for the model
 - * Other p-values are high:
 - rule of law 0.71
 - unemployment 0.75

Second Model

- * Two more parameters:
 - * • Cost to start a business (% of income per capita)
 - * • Total tax rate (% of commercial profits)
- * Measure the ease of doing business in a country
- * Enhancing our model?

Second Model

- * Increase of cost to start a business and tax rate has a negative influence on economic growth as we could expect
- * R-squared of 0.63 which means the model has improved

Second Model

- *p-values are quite high, which means some of the explanatory variables are not enough relevant to be taken into account in the modeling of GDP growth.
- *Market capitalization, foreign investment, number of researchers and rule of law have positive effects.

Conclusion

- * Limits of the model: lots of explanatory variables required to model properly economic growth
- * Panel of data too small : would require 200 countries over a span of 10 years
- * Countries too different: developed countries, developing countries

Conclusion

Top 10 Factors – Developed Countries			Top 10 Factors – Developing Countries	
1	High technology, innovation, R&D	7,89	Stable political environment	7,02
2	High quality of human capital	7,78	Significant Foreign Direct Investment	6,90
3	Specialization in knowledge and capital intensive sectors	7,37	Secure formal institutions (legal system, property rights, tax system, finance system)	6,71
4	Good infrastructure	7,13	Rich natural resources	6,52
5	High degree of openness (networks, links)	7,09	High degree of openness (networks, links)	6,31
6	Secure formal institutions (legal system, property rights, tax system, finance system)	6,97	Good infrastructure	6,28
7	Capacity for adjustment (flexibility)	6,70	Favourable geography (location, climate)	6,07
8	Stable political environment	6,61	Robust macroeconomic management	6,06
9	Free market economy (low state intervention)	6,38	Capacity for adjustment (flexibility)	5,98
10	Robust macroeconomic management	6,22	Low levels of public bureaucracy	5,96