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Conditional Convergence:
A Growth Empirical Approach

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Abstract

This thesis analyzes the growth hypothesises empirically, focusing on whether countries catch up and how they converge. The study is based on Solow's model and its consideration on convergence. The model includes panel data, with 5 periods from 1970 to 2010 and 183 countries, and endogenous Solow variables. The results show evidence in favor of conditional convergence, with a convergence rate of about 1.3%.

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CHAPTER 1 - INTRODUCTION

1.1 Introduction

In the economic debate it is discussed whether or not economies catch up and how. The neoclassical view opts for exogenous growth and considers all the countries converging to the same level of income, therefore poor economies are catching up to the richer ones. On the other hand, those who support endogenous growth, hold the hypothesis of multiple equilibria and poverty traps. Exogenous growth hypothesis is related to the concept of unconditional convergence, endogenous one relies on the conditional one.

In the postwar era unconditional convergence is verified only for countries with similar features i.e. OECD countries . There is no evidence of unconditional convergence over larger samples of countries since economies at the top of the world income distribution are more than 30 times richer than those at the bottom. As an example, the U.S. GDP per capita in 2019 was $65,095 whereas the Nigeria GDP per capita in 2019 was $2,230.

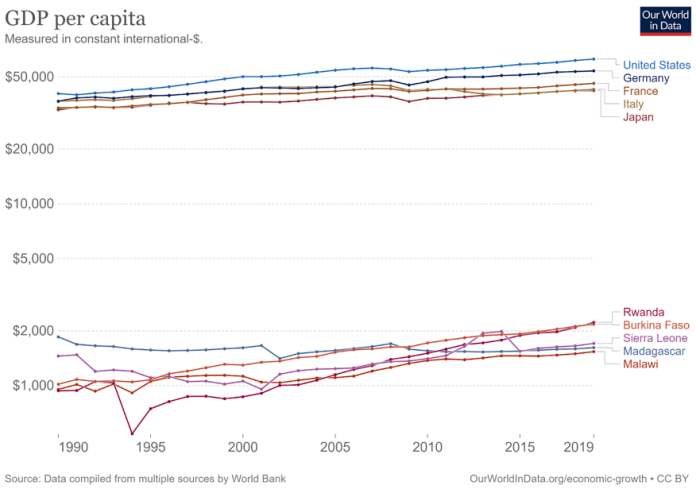

Figure 1 shows the level of GDP per capita over the years for two samples of countries: the highest income economies and the lowest one, following how The World Bank classifies them. The two groups are following two mismatched growth paths.

The gap between countries' income is not constant over time, it has increased considerably between 1960 and 2019, evidence against the unconditional convergence: poor countries are not catching up.

Figure 1.1 (source: Acemoglu, 2008) shows the large increment in the variance of the distribution of countries over the GDP per capita since 1960, meaning always more variability in the levels of GDP per capita of different countries.

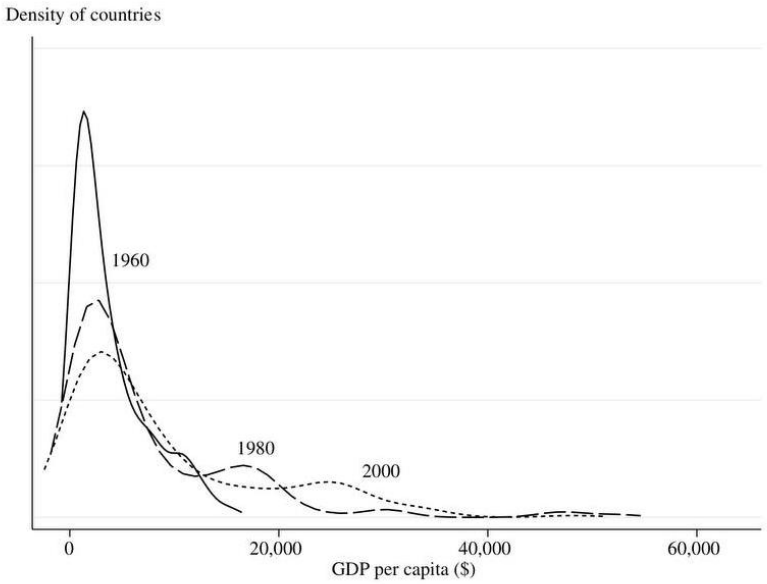

FIGURE 1.1 Estimates of the distribution of countries according to PPP-adjusted GDP per capita in 1960, 1980, and 2000.

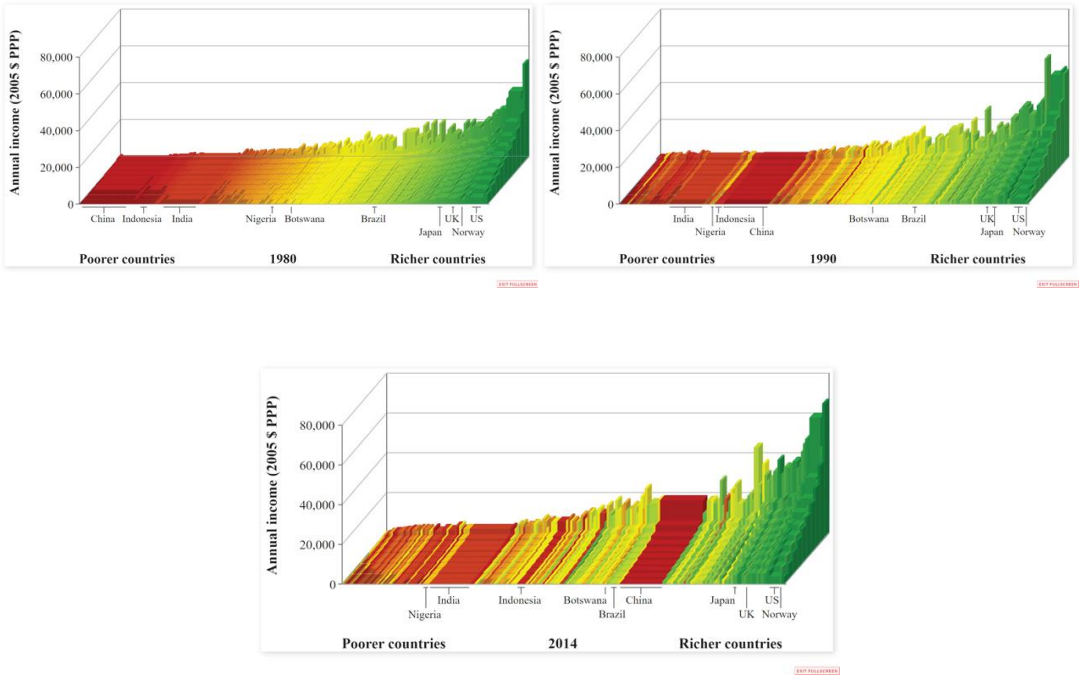

Figure 1.2., source: The economy, The CORE Project

Figure 1.2 shows the movement of inequality between countries over the periods 1980,1990 and 2014. Colors represent the position of countries in the income distribution in 1980. The relative position of countries slightly changes over the years: in general, poor countries are not catching up to rich countries and the differences in the income distribution persist.

This work is aimed at highlining conditional convergence empirically, starting from the Solow's theory, through panel data and endogenous Solow variables.

1.2 Relate Literature

The hypothesis of conditional convergence relies on the idea that specific conditions of countries bring different growth paths and is consistent with the convergence club theory (Galor,1996).

Instead, a try of showing unconditional convergence in the postwar era is given by Baumol (1986), but the result suffers from sample selection bias, since only rich countries are considered. Critiques to this analysis are presented by De Long (1988) and Barro (1991).

The empirical discussion on convergence is founded on β-convergence, the relationship between initial conditions and long-run outcomes. The idea behind is that "if two countries are converging to the common balanced growth path, the one that starts from a lower level of income per capita has a lower-capital-labor ratio and hence a higher marginal product of capital", so a given rate of investment translate into a faster growth for the poorer country (S. Durlauf et al., 2005). β-convergence is commonly present in exogenous growth models and sometimes in the endogenous one (i.e. Jones and manuelli, 1990). From the empirical point of view the convergence is conditional if the β-convergence is verified in a model including controls.

The presence of multiple equilibria is also verified by the endogeneity of Solow variables. By considering the investment rate and the employment rate endogenous, Solow's model demonstrates the occurrence of different equilibria (Fiaschi and Lavezzi, 2003).

In the cross sectional studies the estimations of β-convergence are robust and equal to 2% for conditional convergence with a range between 1% and 3%. This result comes originally from Mankiw, Romer, and Weil (1992) and Barro and Sala-i-Martin (1992) and differs from the original convergence rate of Solow (1956), assuming this to be much higher than the real rate. McQuinn and Whelan (2006) contradict this robustness and find a faster rate of convergence.

Since the aim of this work is dealing with conditional β-convergence, controls for Solow variables are needed.

In the growth empirics literature not all the researchers agree on which are the relevant variables in growth models. Fung (Fung, 2009), by focusing on financial variables, studies how convergence depends on the effective work of the financial system and demonstrates that the degree of development of the financial system brings to convergence or to poverty traps.

Other variables relevant for growth are those related to macroeconomic stability of countries (Bittencourt, 2011) and social and geographic variables (Fiaschi et al., 2019).

CHAPTER 2 - EMPIRICAL METHOD

2.1 Empirical Strategy

The original framework for the empirical analysis of growth is neoclassical. It is known as Barro regression (Barro,1991) and consists in a cross country regression that results in the following equation:

$$\gamma_i = \beta \log y_{i,0} + \psi X_i + \pi Z_i + \varepsilon_i$$

Where X_i represents Solow variables and Z_i represents controls

$\log y_{i,0}$ represents the initial level of the output in log term.

The Solow variables include:

n: growth rate of labor forces
g: rate of technological progress
δ: rate of depreciation of the physical capital
sk: saving rate for physical capital
sh: saving rate for human capital.

These variables are included in the regression as follows:

$$\log(n_i + g + \delta) + \log s_{k,1} + \log s_{h,i}$$

Therefore the extended form of the model is:

$$\gamma_i = \beta \log y_{i,0} + \psi_1 \log(n_i + g + \delta) + \psi_2 \log s_{k,i} + \psi_3 \log s_{h,i} + \pi Z_i + \varepsilon_i$$

The initial condition of outcome is crucial in establishing the β-convergence. Empirical studies (Barro and Sala-i-Martin, 2004), working on different datasets, determine a rule for assuming conditional or unconditional β-convergence:

- when controls are absent, $\beta<0$ is a proof for unconditional β-convergence, which means all countries are converging to the same growth path
- When controls are present, $\beta<0$ is a proof for conditional β-convergence, which means that countries converge to different equilibria.

Concerning Solow variables, the depreciation rate and the rate of technological progress are assumed exogenous and equal to 0,05 (Mankiw et al., 1992), they are included in the regression together with the rate of employment and the result is the augmented employment rate.

2.2 Data

Data about the principal variables GDP, physical capital level, human capital level and number of people employed are taken from PWT 10.0. Rates are computed as differences in log term between the level of the variable at time t and the level at t-1. In particular the growth rate is obtained by elaborating the output per worker.

3 groups of controls are taken into account: proxies for the financial system performance, proxies for macroeconomic stability, a control for urban population.

As regards the financial system performance, 5 variables, included in the Global Financial Development Database from World Bank, are used as proxies for the effective running of the financial system.

- *Assets* (stored as GFDD.DI.04 in the database) is defined as "Deposit money bank assets to deposit money bank assets and central bank assets (%)" and is the share of deposit money bank assets to the totality of assets (deposit money bank assets and central bank assets). It covers the period 1960-2020.
- *Credit* (stored as GFDD.DI.04 in the database) is defined as "Private credit by deposit money banks to GDP (%)" and is the share between the financial resources provided to the private sector by domestic money banks and GDP. It covers the period 1960-2020.
- *M3* (stored as GFDD.DI.05 in the database) is defined as "Liquid liabilities to GDP (%)" and is the ratio of liquid liabilities to GDP. It covers the period 1960-2020.
- *Credit_other_GDP* (stored as GFDD.DI.12 in the database) is defined as "Private credit by deposit money banks and other financial institutions to GDP

(%)" is the ratio between private credit and GDP. It covers the period 1960-2020.

- *Stock_market* (stored as GFDD.DM.02 in the database) is defined as "Stock market total value traded to GDP (%)" and is the total value of all traded shares in a stock market exchange as a percentage of GDP. It covers the period 1975-2020

As regards macroeconomic stability, 2 variables are included as proxies of the macroeconomic stability:

- *Pl_c*: defined as "Price level of household consumption (price level of USA GDP in 2017 = 1).", represents prices of household consumptions. Data are extracted by PWT and covers the period 1960-2020.
- *Debt* is the debt to GDP ratio. Data are extracted from the "A Historical Public Debt Database" of IMF and covers the period 1692-2025.

Finally the model considers the share of urban population to the total population, *Urb*. Data are taken from the "World Development Indicators" database of World Bank. It covers the period 1960-2021.

All the controls are included in the regression as lagged: they refer to the previous time, thus they can be assumed exogenous.

The final database is a balanced panel. It considers 5 periods (1970, 1980, 1990, 2000, 2010) and 183 countries. Totally, the observations are 915.

	growth_rate	lagged_y	sk	n	sh	credit_GDP	assets	M3	credit_other_GDP	stock_market	lagged_pl_c	lagged_debt	lagged_urb
growth_rate	1	0.128	0.466	-0.156	0.032	-0.047	-0.036	0.030	-0.031	0.072	0.002	0.166	-0.135
lagged_y	0.128	1	-0.045	-0.269	-0.027	0.463	0.105	0.550	0.418	0.234	0.176	0.156	-0.012
sk	0.466	-0.045	1	0.356	0.193	-0.291	-0.290	-0.129	-0.297	-0.045	-0.406	0.216	-0.461
n	-0.156	-0.269	0.356	1	0.194	-0.292	-0.276	-0.225	-0.307	-0.154	-0.409	0.036	-0.097
sh	0.032	-0.027	0.193	0.194	1	-0.259	-0.256	-0.190	-0.242	-0.147	-0.440	0.039	-0.318
credit_GDP	-0.047	0.463	-0.291	-0.292	-0.259	1	0.467	0.861	0.958	0.528	0.551	0.053	0.285
assets	-0.036	0.105	-0.290	-0.276	-0.256	0.467	1	0.400	0.481	0.237	0.382	-0.358	0.166
M3	0.030	0.550	-0.129	-0.225	-0.190	0.861	0.400	1	0.812	0.445	0.391	0.235	0.154
credit_other_GDP	-0.031	0.418	-0.297	-0.307	-0.242	0.958	0.481	0.812	1	0.509	0.578	0.029	0.298
stock_market	0.072	0.234	-0.045	-0.154	-0.147	0.528	0.237	0.445	0.509	1	0.321	0.085	0.117
lagged_pl_c	0.002	0.176	-0.406	-0.409	-0.440	0.551	0.382	0.391	0.578	0.321	1	0.133	0.624
lagged_debt	0.166	0.156	0.216	0.036	0.039	0.053	-0.358	0.235	0.029	0.085	0.133	1	-0.013
lagged_urb	-0.135	-0.012	-0.461	-0.097	-0.318	0.285	0.166	0.154	0.298	0.117	0.624	-0.013	1

Figure 2.1

Figure 2.1 shows the correlation matrix. All the variables are correlated to the growth rate, therefore they are determinants of the model. The correlation between Solow variables and controls enforces the previous statement.

Due to the high correlation between proxies for financial system performance, some of them are excluded from the regression in order to avoid collinearity. Stock market is not particularly correlated with the others, indeed it can be included, but only one of the other 4 can be taken into account. Appendix 1 shows 4 regressions: each regression includes only one of the 4 proxies. The results are similar in the 4 models, evidence for the robustness of the effect of the financial system.

In the following analysis "assets" is chosen to be included.

The growth empirics literature focuses on the difficulty in identifying instrumental variables for endogenizing Solow variables (Durlauf et al., 2005). As usual in empirical models, lagged values of Solow variables are taken as instruments:

lagged number of workers, *lagged_N*

lagged capital stock at current PPPs (in million 2017 USD), *lagged_K*

lagged Human capital index, *lagged_Hc*

The final model considered in this work is:

$$\gamma_i = \beta \log y_{i,0} + \psi_1 \log(n_i + 0.05) + \psi_2 \log s_{k,i} + \psi_3 \log s_{h,i} + \pi_{1,i} \text{assets} + \pi_{2,i} \text{stock\_market} + \pi_{3,i} \text{lagged\_pl\_c} + \pi_{4,i} \text{lagged\_debt} + \pi_{5,i} \text{lagged\_urb} + \varepsilon_i$$

CHAPTER 3 – ANALYSIS

3.1 Results

The following regressions analyze the convergence hypothesises by using different econometric techniques.

Table 1: Cross-sectional regressions

	Dependent variable:		
	growth_rate		
	OLS		
	BR	BRDummy	CBR
	(1)	(2)	(3)
log(lagged_y)	0.007	0.017	0.032
	(0.008)	(0.013)	(0.032)
log(n + 0.05)	−0.123***	−0.083	0.007
	(0.039)	(0.083)	(0.092)
log(sk)	0.205***	0.163***	0.191***
	(0.022)	(0.039)	(0.051)
log(sh)	0.023	0.081***	−0.033
	(0.021)	(0.030)	(0.029)
LowerMiddle_Income		0.094	
		(0.313)	
UpperMiddle_Income		−0.224	
		(0.313)	
High_Income		−0.051	
		(0.238)	
log(lagged_y):LowerMiddle_Income		−0.005	
		(0.022)	
log(lagged_y):UpperMiddle_Income		−0.006	
		(0.022)	
log(lagged_y):High_Income		−0.036*	
		(0.021)	
log(n + 0.05):LowerMiddle_Income		0.008	
		(0.123)	
log(n + 0.05):UpperMiddle_Income		−0.047	
		(0.113)	
log(n + 0.05):High_Income		−0.043	
		(0.108)	
log(sk):LowerMiddle_Income		0.135**	
		(0.060)	
log(sk):UpperMiddle_Income		0.075	
		(0.068)	
log(sk):High_Income		−0.001	
		(0.063)	
log(sh):LowerMiddle_Income		−0.020	
		(0.063)	
log(sh):UpperMiddle_Income		−0.128	
		(0.082)	
log(sh):High_Income		−0.148***	
		(0.051)	
assets			0.002
			(0.003)
stock_market			−0.0005
			(0.001)
lagged_pl_c			0.285
			(0.210)
lagged_debt			0.001
			(0.001)
lagged_urb			−0.001
			(0.002)
Constant	0.148	0.215	−0.324
	(0.093)	(0.151)	(0.471)
Observations	456	456	84
Residual Std. Error	0.291 (df = 451)	0.287 (df = 436)	0.200 (df = 74)
F Statistic	38.247*** (df = 4; 451)	9.593*** (df = 19; 436)	3.580*** (df = 9; 74)

Note: Barro Regression, B.R. with dummies, B.R. with controls *p<0.1; **p<0.05; ***p<0.01

Table 2: Cross-sectional and panel regressions

	Dependent variable:		
	growth_rate		
	CBRDummy	PBR	CPBR
	(1)	(2)	(3)
log(lagged_y)	−1.038	−0.550***	−0.671***
	(6.241)	(0.067)	(0.085)
log(n + 0.05)	0.593	−0.073*	−0.020
	(8.276)	(0.044)	(0.039)
log(sk)	−0.502	0.128***	0.048
	(5.103)	(0.024)	(0.032)
log(sh)	−1.232	0.014	−0.044
	(11.699)	(0.025)	(0.046)
assets	0.001		−0.005**
	(0.003)		(0.002)
stock_market	−0.001		−0.002***
	(0.001)		(0.001)
lagged_pl_c	0.308		−0.044
	(0.213)		(0.204)
lagged_debt	0.001		−0.003***
	(0.002)		(0.001)
lagged_urb	−0.0004		0.014**
	(0.003)		(0.006)
LowerMiddle_Income	−12.672		
	(68.380)		
UpperMiddle_Income	−11.436		
	(68.405)		
High_Income	−11.746		
	(68.379)		
log(lagged_y):LowerMiddle_Income	1.116		
	(6.241)		
log(lagged_y):UpperMiddle_Income	0.989		
	(6.243)		
log(lagged_y):High_Income	1.055		
	(6.241)		
log(n + 0.05):LowerMiddle_Income	−0.843		
	(8.265)		
log(n + 0.05):UpperMiddle_Income	−1.008		
	(8.278)		
log(n + 0.05):High_Income	−0.537		
	(8.270)		
log(sk):LowerMiddle_Income	0.906		
	(5.100)		
log(sk):UpperMiddle_Income	0.783		
	(5.106)		
log(sk):High_Income	0.598		
	(5.105)		
log(sh):LowerMiddle_Income	1.228		
	(11.705)		
log(sh):UpperMiddle_Income	1.163		
	(11.702)		
log(sh):High_Income	1.209		
	(11.700)		
Constant	11.599		
	(68.379)		
Observations	84	456	84
Residual Std. Error	0.174 (df = 59)		
F Statistic	3.371*** (df = 24; 59)	46.669*** (df = 4; 314)	3.173** (df = 9; 22)

Note: B.R. controls and dummies, panel regression, panel with controls *p<0.1; **p<0.05; ***p<0.01

Table 3: IV regressions

	Dependent variable:		
	growth_rate		
	instrumental variable		*panel linear*
	IVBR	CIVBR	Final Model
	(1)	(2)	(3)
log(lagged_y)	−0.019	−0.262	−1.289***
	(0.051)	(0.496)	(0.194)
log(n + 0.05)	−0.684*	−1.710	−0.023
	(0.406)	(2.853)	(0.110)
log(sk)	−0.284	0.598	0.022
	(0.378)	(0.627)	(0.074)
log(sh)	1.085	0.698	−0.208***
	(0.693)	(1.777)	(0.078)
assets		−0.008	−0.004
		(0.019)	(0.003)
stock_market		0.003	−0.003**
		(0.007)	(0.001)
lagged_pl_c		−1.515	−0.193
		(2.989)	(0.176)
lagged_debt		0.0004	−0.004***
		(0.007)	(0.001)
lagged_urb		0.015	0.021***
		(0.036)	(0.008)
Constant	1.894	3.384	
	(1.235)	(6.950)	
Observations	456	80	80
Residual Std. Error	0.852 (df = 451)	1.039 (df = 70)	
F Statistic			13.930

Note: IV, IV controls, panel IV controls *p<0.1; **p<0.05; ***p<0.01

The original Barro regression (BR), that is based on cross-sectional data, does not show evidence in favor of convergence. The coefficient of the initial level of income is not statistically different from 0. The model includes significant coefficients for the augmented employment and for the investment rate in physical capital, both significant for every level of significance. The signs of the two variables are consistent with Solow's theory: the investment has a positive impact on growth; an increase in the augmented employment impacts negatively on growth.

It is interesting to investigate the coefficients by introducing the dummies for the level of income and by controlling the interactions with the BR variables , through the BRDummy regression.

The dummies are constructed following the classification of The World Bank (World Bank Country and Lending Groups classification) which collects countries into 4 groups to vary the GNI per capita, calculated using the World Bank Atlas method. The four groups are:

- *Low-Income Economies*, when $GNI_{\text{per capita}} \leq 1085$ in 2021
- *Lower Middle-Income Economies*, when $1086 \leq GNI_{\text{per capita}} \leq 4255$ in 2021
- *Upper Middle-Income Economies*, when $4256 \leq GNI_{\text{per capita}} \leq 13205$ in 2021
- *High- Income Economies*, when $GNI_{\text{per capita}} \geq 13205$ in 2021

The variables log(lagged_y), log(n + 0.05), log(sk), log(sh) refer to the omitted dummy Low_Income. The initial level of income is still not significant and the augmented employment loses significance. The investment rate in human capital

gains significance and its coefficient is positive: an increase in the investment rate in human capital for low income countries causes higher growth rates, ceteris paribus.

The only significant interactions are:

- *log(lagged_y):High_Income*, the initial level of income for high income countries impact less than for the omitted variable. It is significant at 0.1.
- *log(sk):LowerMiddle_Income*, the investment rate in physical capital for lower middle income countries has a stronger effect on the growth rate than for the omitted dummy. It is significant at 0.05
- *log(sh):High_Income*, the investment rate in human capital for high income countries. The additional effect is negative and significant for every level of significance. In absolute value it is greater than the coefficient of sh, that means the net effect is negative, as if investing in human capital is counter-productive to the growth of high income countries.

To study the conditional convergence, controls are included in the CBR model. When controls are introduced the number of observation strongly decreases.

The 5 controls are not significant and jointly statistically not different from 0 (Figure 3.1)

Table 4: F-test for controls

Statistic	N	Mean	St. Dev.	Min	Max
Res.Df	2	76.500	3.536	74	79
Df	1	5.000		5	5
F	1	0.576		0.576	0.576
Pr(>F)	1	0.718		0.718	0.718

Figure 3.1

When controls are present, the β-convergence is evidence for conditional convergence, however the initial level of income in this regression is still not significant.

The only significant Solow variable is the investment rate in physical capital, whose coefficient is slightly reduced than in BR.

Also in CBRDummy, which differs from CBR for the presence of the dummies for income, there is no evidence for convergence: differently from the previous regressions the β-coefficient is negative, but not significant. In addition neither interactions nor other variables are significant.

A further step is the analysis through panel data. The following comparison is between BR and PBR since CBR has no significant variables.

In general by considering panel data, coefficients change and the model seems more significant. There is evidence in favor of convergence: the β-coefficient is negative and significant, meaning that the higher is the initial level of income the lower is the growth rate. Therefore countries are converging to a certain level of income.

As regards the investment rate in physical capital and the augmented employment, they are significant and they respect the theoretical signs.

By introducing controls in the panel data regression (CPBR) there is evidence for conditional convergence, since the β-coefficient is negative and significant. Hence, countries converge to multiple equilibria.

Coefficients for Solow variables are no more significant unlike controls.

The last 3 regressions consider the Solow variables as endogenous.

IVBR considers the Barro regression with endogenous Solow variables. There is no proof for convergence and the model itself is not particularly significant. CVBR considers endogenous Solow variables and exogenous controls. All the variables are not significant.

In both the regressions the endogeneity makes the model worse.

The Final Model concludes the analysis on convergence. It includes controls, panel data and endogenous Solow variables.

Appendix 2 shows the first stages for endogenous variables, the starting point to demonstrate how instruments perform.

It follows the analysis on relevance (Figure 3.2).

Table 5: F-test for first stage: sk

Statistic	N	Mean	St. Dev.	Min	Max
Res.Df	2	84.500	2.121	83	86
Df	1	3.000		3	3
F	1	2.102		2.102	2.102
Pr(>F)	1	0.106		0.106	0.106

Table 6: F-test for first stage: sh

Statistic	N	Mean	St. Dev.	Min	Max
Res.Df	2	84.500	2.121	83	86
Df	1	3.000		3	3
F	1	10.637		10.637	10.637
Pr(>F)	1	0.00001		0.00001	0.00001

Table 7: F-test for first stage: n

Statistic	N	Mean	St. Dev.	Min	Max
Res.Df	2	84.500	2.121	83	86
Df	1	3.000		3	3
F	1	3.695		3.695	3.695
Pr(>F)	1	0.015		0.015	0.015

Figure 3.2

Figure 3.2 shows the F tests for first stages of s_k, s_h, n

- s_k: since H0 is accepted, instruments are not relevant for s_k.
- s_h, since H0 is refused for every level of significance, instruments are relevant and strong (F>10)
- n, since H0 is refused at 0.05, the instruments are relevant but not strong (F<10)

The instruments are lagged variables, therefore they are assumed as exogenous.

Coming back to the Final Model, the only Solow variable significant is the investment rate in human capital. It has a negative coefficient, as if the investment in human capital is damaging for economic growth. The negative coefficient is a common result of the analysis through panel data estimation techniques (Arcand & D'Hombres, 2002).

The β-coefficient is negative and significant for every level of significance. It is much greater in absolute value than in the previous regressions because of the previous biased coefficients. Since the coefficient of log(lagged_y) is, in absolute value, 1.289 the convergence rate is about 1.3%, smaller than the commonly assumed 2%, but within the range [1%,3%] resulted in the empiric growth literature.

CHAPTER 4 – CONCLUSIONS

4.1. Conclusions

In this thesis I have analyzed the convergence theoretical hypothesises from the empirical point of view. As a starting point the Barro regression (Barro, 1991) is taken into account and different kinds of controls are included, from financial to macroeconomic and urban variables. The analysis is conducted step by step, including variables and different estimation techniques one at a time until the construction of the "Final Model", including IV, panel data, and controls. The results regarding β-convergence are evidence in favor of conditional convergence, since a negative and significant β-coefficient is estimated. The size of the coefficient is within the range of values empirically found in the progressed literature, consequently this model is an additional proof of conditional convergence even if its result is not revolutionary.

Appendix 1

Table 1: OLS with different controls for financial system

	Dependent variable:			
			coefficient test	
	(1)	(2)	(3)	(4)
Constant	−0.3243	−0.0643	−0.1523	−0.1169
	(0.4714)	(0.3776)	(0.3827)	(0.3726)
log(lagged_y)	0.0322	0.0225	0.0282	0.0270
	(0.0320)	(0.0324)	(0.0319)	(0.0318)
log(n + 0.05)	0.0071	0.0015	−0.0024	−0.0017
	(0.0918)	(0.0892)	(0.0900)	(0.0913)
log(sk)	0.1907***	0.1809***	0.1831***	0.1841***
	(0.0510)	(0.0488)	(0.0493)	(0.0486)
log(sh)	−0.0330	−0.0290	−0.0344	−0.0305
	(0.0292)	(0.0263)	(0.0260)	(0.0267)
assets	0.0016			
	(0.0031)			
M3		0.0002		
		(0.0010)		
credit_other_GDP			−0.0001	
			(0.0009)	
credit_GDP				−0.0001
				(0.0010)
stock_market	−0.0005	−0.0004	−0.0002	−0.0002
	(0.0006)	(0.0005)	(0.0008)	(0.0008)
lagged_pl_c	0.2846	0.3152*	0.2922	0.3159
	(0.2102)	(0.1871)	(0.1893)	(0.2029)
lagged_debt	0.0009	0.0006	0.0007	0.0007
	(0.0014)	(0.0012)	(0.0013)	(0.0012)
lagged_urb	−0.0010	−0.0013	−0.0010	−0.0013
	(0.0018)	(0.0015)	(0.0016)	(0.0016)
Note:				*p<0.1; **p<0.05; ***p<0.01

Appendix 2

Table 1: First Stages

	Dependent variable:		
	sk	sh	n
	(1)	(2)	(3)
Constant	1.0629***	0.2078***	0.3519*
	(0.3716)	(0.0487)	(0.1837)
lagged_y	0.000000	0.000000*	0.000000
	(0.000000)	(0.000000)	(0.000000)
lagged_N	0.0007	−0.0002***	−0.0003
	(0.0009)	(0.0001)	(0.0004)
lagged_Hc	−0.0116	−0.0669***	−0.1332***
	(0.0907)	(0.0125)	(0.0454)
lagged_K	−0.000000	−0.0000	−0.000000
	(0.000000)	(0.0000)	(0.000000)
assets	−0.0018	0.0004	0.0006
	(0.0035)	(0.0005)	(0.0020)
stock_market	−0.00002	0.0001*	0.0005
	(0.0009)	(0.0001)	(0.0003)
lagged_pl_c	−0.1650	−0.0192	−0.1781**
	(0.1938)	(0.0210)	(0.0783)
lagged_debt	0.0035*	0.0001	0.0010
	(0.0019)	(0.0002)	(0.0007)
lagged_urb	−0.0055*	0.0002	0.0024**
	(0.0030)	(0.0003)	(0.0012)
Note:		*p<0.1; **p<0.05; ***p<0.01	

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