FACULTAD DE CIENCIAS ECONÓMICAS
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GRADO EN ECONOMÍA

THE IMPORTANCE OF INFORMAL INSTITUTIONS FOR LONG TERM ECONOMIC GROWTH:

THE EUROPEAN SCENARIO, A NEW APPROACH

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ABSTRACT

This dissertation develops the empirical and theoretical case that differences in informal institutions are an important cause of differences in economic performance. It starts off by providing a concise definition of informal institutions and going through the concepts that are necessary for the following analysis.

The quasi-natural experiment of the EU-15 members is used to evaluate the theoretical model's proposition: the interaction of Common Formal Institutions and their Enforcement characteristics with better Informal Institutions results in higher productivity levels and, thus, long-term economic growth. By assuming that the EU-15 countries have the same formal institutions, using productivity measures as dependent variables and Kauffman Governance indexes as explanatory variable (controlling with proxies for countries enforcement capacities), the latter is assessed econometrically.

The results confirm the crucial role of informal institutions. It is thus suggested that further research should be made on their nature and impact. Furthermore, it is felt that the design of policies aimed at fostering development should be rethought.

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1. INTRODUCTION

1.1. INSTITUTIONS AND ECONOMIC GROWTH

Growth Theory is focused on explaining countries' differences in economic performance. Traditionally, economic models have attributed the latter disparities to differences in factor accumulation: on physical capital, on human capital and more lately, on technology (in its endogenous growth variants). Figure 1.1 summarizes the main models belonging to this theoretical framework. Despite having provided important insights for the understanding of economic development, what must be made clear is that these models fail to explain a great part of the variation in GDPpc across countries[1]. Furthermore, even if they were successful in doing so, the causes they refer to can only be accounted for as "proximate determinants of growth": the question remains why there exist such differences in the factor accumulation dynamics of countries.

Figure 1.1 – Traditional Growth Models

Author	Year	Growth Theory
Solow	1956	Differences in factor accumulation due to differences in savings rates
Cass-Koopmans	1965	(Solow) or preferences (Cass-Koopmans).
Romer	1986	Include the idea that externalities from physical and human capital
Lucas	1988	accumulation can induce sustained steady state growth.
Romer	1990	
Grossman - Helpman	1991	Endogenize steady-state growth and technical progress.
Aghion-Howitt	1992	

Source: own elaboration based on Acemoglu et al. (2004),

Contemporary deep-determinants-of-growth literature recognizes differences in institutional quality as a fundamental cause of differences in economic development (Acemoglu et al. 2004, Chang 2005, Williamson 2009). According to Rodrik, the quality of institutions outranks any other factors (Rodrik et al. 2004)[2]. Nonetheless, analyzing the relationship which exists between institutions and economic performance is not a simple task:

[1] For empirical proof refer to Annex 1.

[2] A convincing argument against Geographical factors as deep determinant of growth is the so-called "reversal of fortune" (Acemoglu et al. 2002): without having experienced changes in their geography, certain societies which previously where prosperous have retreated backwards.

A great difficulty involved in the study of the relationship between institutions and economic development is that there is no widely accepted definition of institutions (Chang 2005). The definition that has become prevalent is the one given by North that depicts institutions as the "humanly devised constraints that structure political, economic and social interaction" (North 1991). According to the latter, Institutions may thus be understood as "the rules of the game in a society".

Even if we take this definition as complete and true, portraying how institutions promote economic development is still a complex issue. As North pointed out, Institutions are important because they "structure incentives, whether political social or economic" (North 1991). Acemoglu, who distinguishes between economic and political institutions, takes this premise and goes further to provide a rationale: "Economic institutions matter for economic growth because they shape the incentives of economic actors in society" (Acemoglu et al. 2004). By structuring economic incentives, institutions are implicitly determining the allocation of resources of an economy. An efficient allocation will give place to long term economic growth[3]. The argument is evidenced by the fact that countries with bad political institutions but good economic institutions have proven capable of registering long term economic growth (Singapore, China).

The final difficulty that is worth stressing in this section arises when trying to delimit what "Good Institutions" are. Defining "Good Institutions" as "those which promote economic growth" has an embedded danger: institutions may lead to a relative high growth during a period but be harmful in the long-term. For example, a set of economic institutions that promotes excessive house investment may be generating high economic growth but will also be inflating an unsustainable housing bubble that will eventually harm the economy. Bearing this in mind, for the purpose of this dissertation, I will consider that Good Institutions are those which align private and social returns ensuring an efficient allocation of resources (Alonso 2014). The gist is not contrary to Islam's and Montenegro's viewpoint that institutional efficiency is contingent to a country's local conditions (Islam and Montenegro 2002). It is also reconcilable with the concept of *efficient transitional institutions* (Quian 2003): "Good institutions" that do not respond to Optimal Canons but do correct specific inefficiencies as a result of their dynamic and adaptive nature.

[3] Besides, Institutions also help shaping expectations decreasing the degree of uncertainty and reducing the transactions costs of economic interaction (Alonso 2009).

1.2. INFORMAL INSTITUTIONS

"*Institutional arrangements are the combination of formal constraints, informal rules and their enforcement characteristics*" (North 2005).

Institutional Frameworks must be understood as the result of the interaction of three elements: Formal Institutions, Informal Institutions and their Enforcement Mechanisms. Due to their more visible nature, the Literature (e.g. Seyoum, 2009; Puffer et al. 2010; Beyer & Fening, 2012) has often focused exclusively on Formal Institutions neglecting the importance of the other two components. Good institutional analysis requires rigorous attention to the three elements as a whole:

Defining formal institutions is relatively simple. North's characterization of the latter serves the purpose: "the formal rules that structure political, economic and social interaction" (North 1991). This includes constitutions, laws and regulations, but also formal organizations - organizations are specified by certain rules so their name can be used as a synonymous for indicating these rules (Lauth 2004).

Coming up with a precise and analytically useful definition of Informal Institutions it's though more complex. The term "Informal institution" has often been treated as a residual category, in the sense that it has been applied to any behaviour not accounted for by the formal rules (Helmke & Levitsky 2004). As a result, several misconceptions have been made:

First, the ineffectiveness of formal institutions has been erroneously conceived as an informal institution. Formal institutional weakness does ease the appearance of informal institutions, but is not an informal institution in itself and it does not even necessarily imply their presence. For example, the orange traffic light rule is clearly a weak formal institution in those societies where it is not deeply rooted (as it is difficult to enforce). Nonetheless, the non-compliance with the rule is not in itself an informal institution and it may not entail the presence of an informal rule underlying it. E.g.: as there is little chance of being sanctioned for speeding up (instead of slowing down) when the traffic light turns orange, some citizens may in occasions do so. This behaviour is not "institutional": it is not a humanly devised constraint that structures social interaction. An informal institution will only exist if there is a shared unwritten expectation enforced unofficially of how to behave when the traffic light turns orange. This is probably the case in Spain: speeding up when the traffic light turns orange is indeed a rule that you can expect drivers to follow (slowing down will probably imply being crashed from behind) and whose violation is unofficially sanctioned (drivers sound the horn or shout at those who do not speed up).

Second, irregularities in citizens, politicians and public servants, as well as biases in the application of norms, have been incorrectly interpreted as informal institutions. For example, public graft is clearly an irregularity in politicians' behaviour but it should not be considered an informal institution per se. Graft can only be considered an institutional behaviour where it is rooted in widely shared expectations among citizens and public officials (Helmke & Levitsky 2004). In other words: where it is a "rule of the game".

Aside from this, some Scholars have equated informal institutions with culture[4]. The latter is also imprecise. There are differences between both notions that should be considered:

Culture indicates a much broader concept (Lauth 2004). An elucidating way of distinguishing between informal institutions and culture has been proposed by Helmke and Levitsky: defining informal institutions in terms of shared expectations and culture in terms of shared values. Shared values will in occasions give place to shared expectations but this may not always be the case. Furthermore, informal institutions may or may not be rooted in cultural values. Nonetheless, cultural values can reinforce or undermine certain informal institutions.

This dissertation will embrace Helme's and Levitsky's definition of informal institutions: "socially shared rules, usually unwritten that are created, communicated and enforced outside of officially sanctioned channels" (Helmke & Levitsky 2004). The latter delimitation is probably the one that better captures the essence of informal institutions. Bearing this in mind, the main differences between formal and informal institutions are contained in figure 1.2.1.

Figure 1.2.1 – Formal and Informal Institutions

	INSTITUTIONS	
	Formal	**Informal**
Nature	Express (Written)	Tacit (Unwritten)
Identification	Easy to Identify	Complex
Sanction	Official (Legal)	Unofficial (Social)
Recognisition	By the Whole Society	Less Universal
Transparency	Open to Public Scrutiny	Less Transparent
Enforcement Characteristics	Subject to control Varying Enforcement capacity	Imperfectly subject to deliberate control High Enforcement Capacity

Source: own elaboration.

[4] See North 1990; Knight 1992.

Informal institutions are critic to explain institutional outcomes. They are not necessarily "bad" or "good" and must be analysed within the particular institutional framework to which they belong. As mentioned above, an institutional framework is a set of formal institutions, informal institutions and their enforcement characteristics.

Bearing this in mind, informal institutions can be categorised into 4 types (included in figure 1.2.2.): Complementary, Accommodating, Competing and Substitutive[5].

Figure 1.2.2 – A Typology of Informal Institutions

OUTCOMES	Effective	Ineffective
Convergent	**Complementary**	**Substitutive**
Divergent	**Accommodating**	**Competing**

Source: own elaboration based on Helmke & Levitsky 2004.

Where formal and informal institutions incentives converge, informal institutions will be either "Complementary" or "Substitutive". In societies where formal institutions are effectively enforced, convergent informal institutions will "fill in gaps" and enhance efficiency. They will be **Complementary**. In societies where formal institutions are weakly enforced, convergent informal institutions will replace them and pursue the outcomes that formal institutions were meant to achieve. They will be **Substitutive**.

Where formal and informal institutions incentives diverge, informal institutions will be either "Accommodating" or "Competing". In societies where formal institutions are effectively enforced, divergent informal institutions will incentive the modification and violation of formal rules but will proof unable to do so. They will be **Accommodating**. In societies where formal institutions are weakly enforced, divergent informal institutions will replace them and generate different incentives. They will be **Competing**.

An informal institution will be good if, within its framework, it contributes towards aligning private and social returns ensuring and efficient allocation of resources (i.e.: it improves the institutional outcome).

[5] This typology is based on Helmke & Levitsky 2004.

1.3. THE IMPORTANCE OF INFORMAL INSTITUTIONS: A NEW APPROACH

The objective of this dissertation is to analyse the importance of informal institutions for long-term economic growth.

In order to do so, the dissertation starts off by providing a theoretical framework on how Informal Institutions affect Economic Performance. The model predicts that the interaction of Informal Institutions with Formal Institutions (and their enforcement characteristics) shapes the incentives that determine the allocation of agents between "Highly" and "Poorly" Productive Activities in an economy. Ceteris Paribus (keeping formal institutions and their enforcement characteristics constant), it is expected that countries with better informal institutions (those that improve the institutional outcome) have greater proportions of agents engaged on highly productive activities and, thus, are more productive. This proposition is assessed empirically by focusing in a "quasi-natural experiment": The EU-15 Area.

The new approach builds on the premise that there exists a common Formal Institutional Framework for the EU-15 countries. As a result, differences in each nation's Institutional Quality Indexes (based on perceptions) can be attributed to their differences in their informal institutions that interact with the European Common Institutions (after having controlled for each country's enforcement characteristics). *EU-INFORM* is the name given in this dissertation to the index that captures "the quality of the interaction of different Informal Institutions with the Common European Formal Framework". In order to evaluate this dissertation's proposition, I evaluate the statistical significance of *EU-INFORM* as an explanatory variable in regressions where diverse measures of productivity are used as dependent variables.

The results confirm the veracity of the proposition derived from the theoretical model: *The interaction of Common Formal Institutions and their Enforcement characteristics with better Informal Institutions results in higher productivity levels.*

The remainder of this dissertation is structured as follows: In section 2, I review the Empirical Research that has been conducted on informal institutions. In section 3, I present a theoretical model on how informal institutions affect growth from which I draw a *proposition* to be tested empirically. In section 4 I describe the data employed in the empirical analysis. In section 5, I use econometric techniques to model the propositions derived from the theory and test them empirically. The results are presented in section 6. In the final part, I outline the limitations of my study, I provide some ideas for future research and I highlight the implications of my findings.

2. LITERATURE REVIEW (EMPIRICAL STUDIES)

Empirical study[6] on the impact of Informal Institutions has its origin on the Culture-Economics literature: in 2005, Tabellini examined the effect of culture on incomes per capita across European Regions (Tabellini 2005). The earlier empirical paper using the term "Informal Institution" is Knowles' and Weatherston's (2006).

Most of the literature has based its measure of informal institutions on Tabellini's (2005) Composed Cultural Index (see, for example, Knowles and Weatherston 2006 or Dobler 2009). The latter index consists of 4 cultural features: *trust* (the extent to which individuals feel they can trust other people), *control* (the extent to which individuals feel they have the freedom to control their destiny), *respect* (the extent to which individuals feel that respect is an important quality) and *obedience* (the extent to which individuals feel that obedience is an important quality). The index is the sum of its three first components minus *obedience* (which is considered a growth-inhibiting cultural trait)[7]. The informal institutions indicators have been composed as the sum of the first three components of Tabellini's index.

The aim of these studies has been to incorporate informal institutions to the deep-determinants-of-growth literature (focused almost exclusively on the formal institutions vs. geography debate). The results[8] that they have obtained suggest that informal institutions are important in explaining cross-country income differences; in some specifications even more than formal institutions (Knowles and Weatherston 2006, Dobler 2009).

While these papers are a valuable contribution to the literature, they do present several problems:

The first of those problems refers to the doubtful assumption that informal institutions are equivalent to culture or social capital. The INFORM index is an empirical proxy for the existence of informal institutions: countries with higher levels of *Trust*, *Respect* and *Control*, will probably have higher incentives to generate informal institutions - "If people believe that what happens to them is largely the result of fate, they will be less likely to devise informal institutional arrangements" (Knowles and Weatherston 2006). Nonetheless, it is a culture index and, as so, an imperfect proxy for informal institutions: informal institutions are not necessarily enrooted in cultural values. E.g. an informal institution may arise as a necessity to cover a gap in the formal rules. Furthermore, not all shared values give place to informal institutions. The

[6] I will consider that empirical studies are those which use data and econometrical approaches.
[7] For further information refer to Tabellini (2005) or Knowles and Weatherston (2006).
[8] The results have been attained using instrumental variables (to deal with endogeneity) and controlling for geography and formal institutions.

authors do not bear this in mind and equate culture/social capital with informal institutions.

The second problem refers to the over simplistic consideration given to the role of informal institutions as a deep determinant of cross-country income differences. Underlying these studies lays intrinsically the assumption that informal institutions unilaterally affect Growth. The latter is a very limited and imprecise view of the importance of informal institutions for economic growth. As already mentioned (in this dissertation's introduction) Informal institutional outcomes must be analysed within the particular institutional arrangement to which they belong: the same informal institution that promotes growth under a specific Formal Institutional framework may inhibit growth under a different one.

The third problem refers to the papers' oversight of the contingent nature of institutions. Knowles and Weatherston assume that Informal Institutions based on trust, respect and control are "good" for economic growth: "the norms and conventions that are likely to increase productivity or factor accumulation will be underpinned by a high degree of trust". This clearly ignores the fact that the efficiency of institutional response is, to a large extent, historically and socially contingent" (Alonso 2009).

3. THEORETICAL FRAMEWORK: A SIMPLE MODEL

The challenge is to point out concrete features with which the impact of informal institutions on economic growth can be analysed.

In order to do so, I develop an equilibrium model, based on Acemoglu (1995) and Murphy et al. (1993), which takes into consideration the concepts that have been stressed in the previous sections:

(1) Informal Institutions are the socially shared rules, usually unwritten that are created, communicated and enforced outside of officially sanctioned channels.
(2) Informal Institutions' impact on growth is contingent to the local conditions and the specific Institutional Framework to which they belong.
(3) Informal institutions matter for economic growth because they influence the shaping of economic incentives in society which implicitly determine the allocation of resources of an economy.

A SIMPLE MODEL

I assume that the economy consists of a continuum of identical agents normalized to 1. Each agent can allocate himself to:

1. Highly Productive Activities: those that bring positive returns to the individual and to society.

2. Poorly Productive Activities: those that bring positive returns to the individual but not to society. E.g.: rent-seeking (deviating rents has no positive return to society), real estate-construction during housing bubbles (producing houses when there is an excess of houses has no positive return to society), over-expanding the state apparatus (increasing the size of the state beyond efficient proportions has no positive return to society).

The proportion of Poorly Productive Agents (PPAs) in the economy is denoted by n. The proportion of Highly Productive Agents (HPAs) is thus $[1 - n]$.

The Individual Return of the HPAs is denoted by R_{HPAs} whereas the Individual Return of the PPAs is R_{PPAs}. The latter contemplate both pecuniary and non-pecuniary rewards. The Relative Returns depend on the Institutional Parameters: β_1 and β_2 (better Institutions increase β_1 and reduce β_2). Hence, Institutional outcomes influence agents' incentives to become HPAs or PPAs.

Each HPA total product is $\alpha + X(n)$ where $X(n)$ is the investment level that has an associated cost $C(X)$.

A proportion E of the PPAs (n) will be "rent-seekers" that extract income from the HPAs. A HPA will lose $\left[\frac{1}{E} - \frac{q}{E}\right]$ of his total product whenever he deals with a rent-seeker. The probability of dealing with a rent seeker is equal to the proportion of rent-seekers in the economy, denoted by: $E \cdot n$.

- **The personal return of the HPAs will be:**

$$R_{HPA} = \left[1 - n[1 - q]\right] \cdot [\alpha + X(n)] - C\big(X(n)\big) + \beta_1 \qquad (1)$$

Where the investment level $\big(X(n)\big)$ is set to maximize each HPA's return:

$$\max_X \left[1 - n[1 - q]\right] \cdot [\alpha + X] - C(X) + \beta_1$$

F.O.N.C:

$$\frac{\partial}{\partial X} \Rightarrow \left[1 - n[1 - q]\right] - C'(X)$$

$$X(n) = \delta \left[1 - n[1 - q]\right]$$

Where δ is the inverse function of $C'(\cdot)$

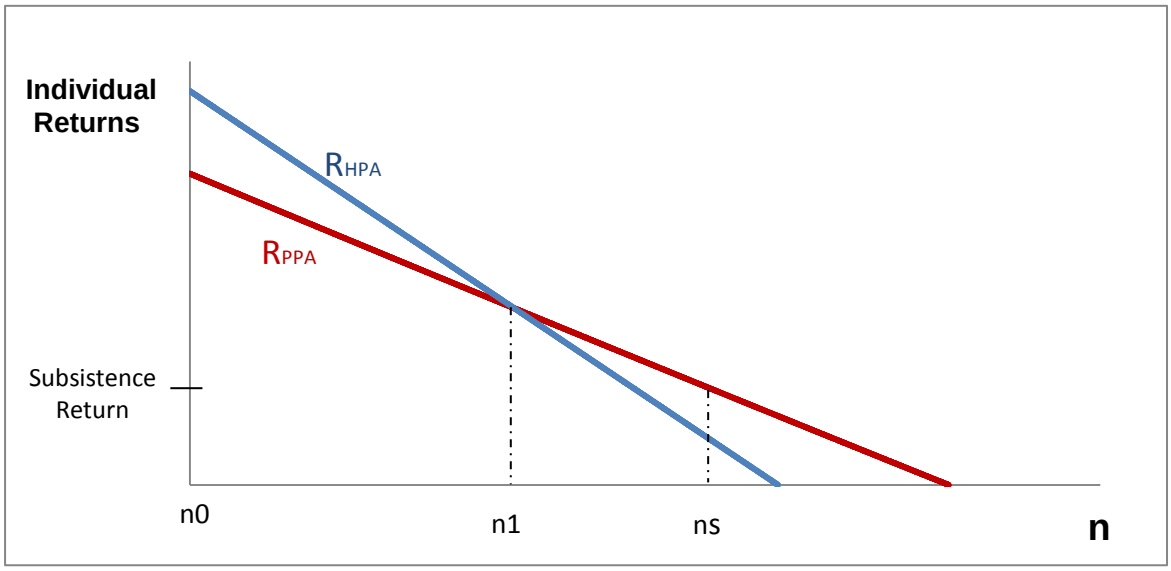
The rewards of the PPA (obtained through bribery, inflating economic bubbles, over-expanding the state capacity, etc.) are denoted by $L(n)$. Their personal return will depend on the proportion of the population engaged in Poorly Productive Activities (n).

- **The personal return of the PPAs will be:**

$$R_{PPA} = [1 - n\,] \cdot L(n) + \beta_2 \qquad (2)$$

An agent's decision to undertake a Highly Productive Activity or a Poorly Productive Activity will be determined by the relative returns of each of the latter. The following graphical analysis[9] portrays how agents' incentives work.

Graph 3.1 – Relative Personal Returns as a Function of n



Source: own elaboration.

When $n \in [n_0, n_1)$ → $R_{HPA} > R_{PPA}$ → the agent will prefer Highly Productive Activities.

When $n \in (n_1, n_s]$ → $R_{HPA} < R_{PPA}$ → the agent will prefer Poorly Productive Activities.

It is observed that PPA exhibit increasing relative returns (relative to HPA). This makes sense. E.g.: returns to HPAs decrease as the amount of rent-seekers (rent-seeking is one of the Poorly Productive Activities) taking their wealth increases. As a result there are multiple equilibria:

At $n0$ (where all agents are HPAs: $n = 0$) no agent has an incentive to unilaterally deviate: becoming a PPAs ($\Rightarrow n \downarrow$) implies earning a lower return than the one earned as a HPA. Hence, $n0$ is a stable and good (highly productive) equilibrium.

At ns (where there are so many PPAs that Agents' returns are at subsistence levels) no agent has an incentive to unilaterally deviate: becoming a HPA implies earning a lower return than as a PPA; becoming a PPA implies earning a return below subsistence level. Hence, ns is a stable but bad (unproductive) equilibrium.

[9] Go to Annex 2 for a detailed explanation on how the graphical analysis was carried out.

$n1$, where $R_{HPA} = R_{PPA}$, i.e.:

$$\left[1 - n[1 - q]\right] \cdot [\alpha + X(n)] - C\big(X(n)\big) + \beta_1 = [1 - n\,] \cdot L(n) + \beta_2 \qquad (3)$$

is an unstable equilibrium:

- An increase in n beyond $n1$ (when an agent decides to become a PPA) raises returns to Poorly Productive Activities above returns to Highly Productive Activities. It thus invites further increases in agents devoted to Poorly Productive Activities: $n \rightarrow ns$

- A decrease in n below $n1$ (when an agent decides to become a HPA), raises returns to Highly Productive Activities above returns to Poorly Productive so that more individual agents have incentives to become HPAs: $n \rightarrow n0$

Having presented the model, I can now analyse the **role of informal institutions**:

The parameters β_1 and β_2, that capture the quality of institutions, depend on the interaction of informal institutions with formal institutions and their enforcement characteristics.

Condition 1 –Formal Institutions and their Enforcement Characteristics are held constant.

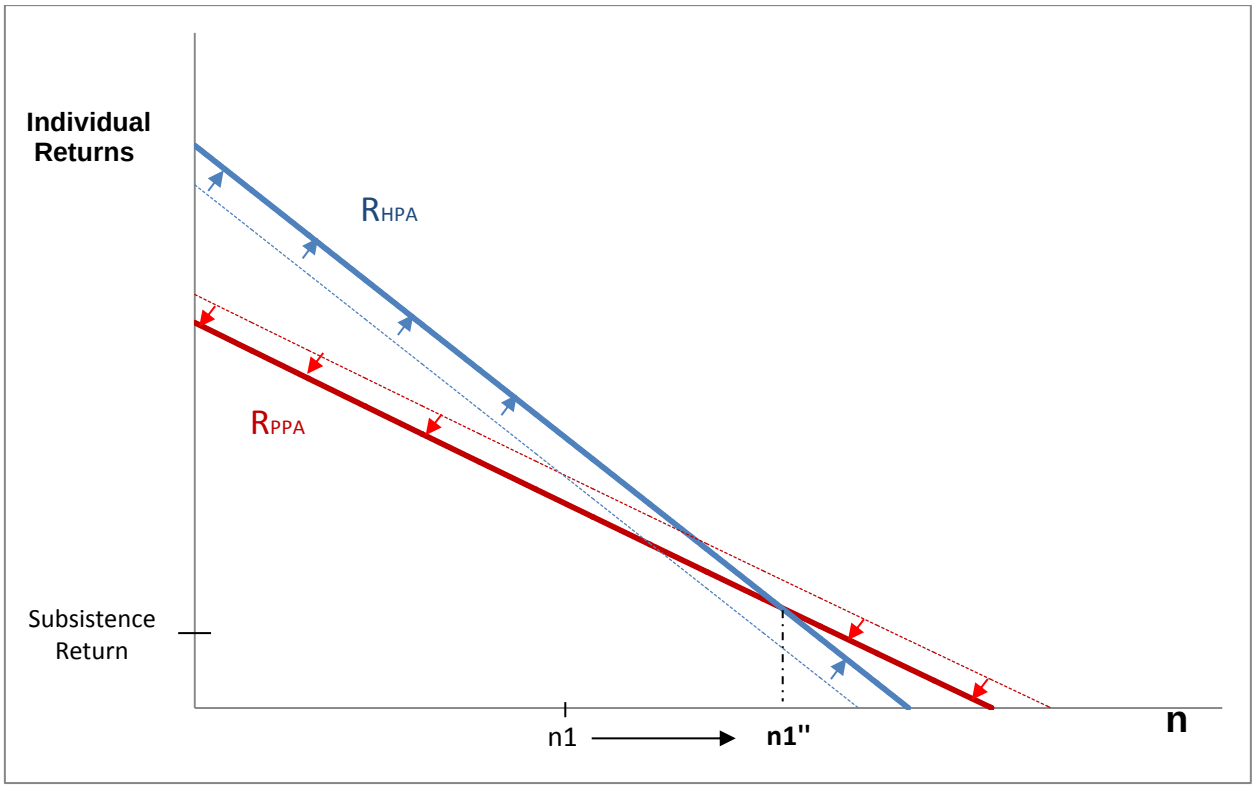
This condition implies that β_1 and β_2 become primarily dependent on the nature of Informal Institutions. i.e.: the quality of different institutional outcomes, with common Formal Institutions and common Enforcement Characteristics, will depend on the quality of their varying informal institutions.

Condition 2 – Better informal institutions are those which, within their Institutional and Local framework, improve the institutional outcome.

If condition 2 is satisfied:

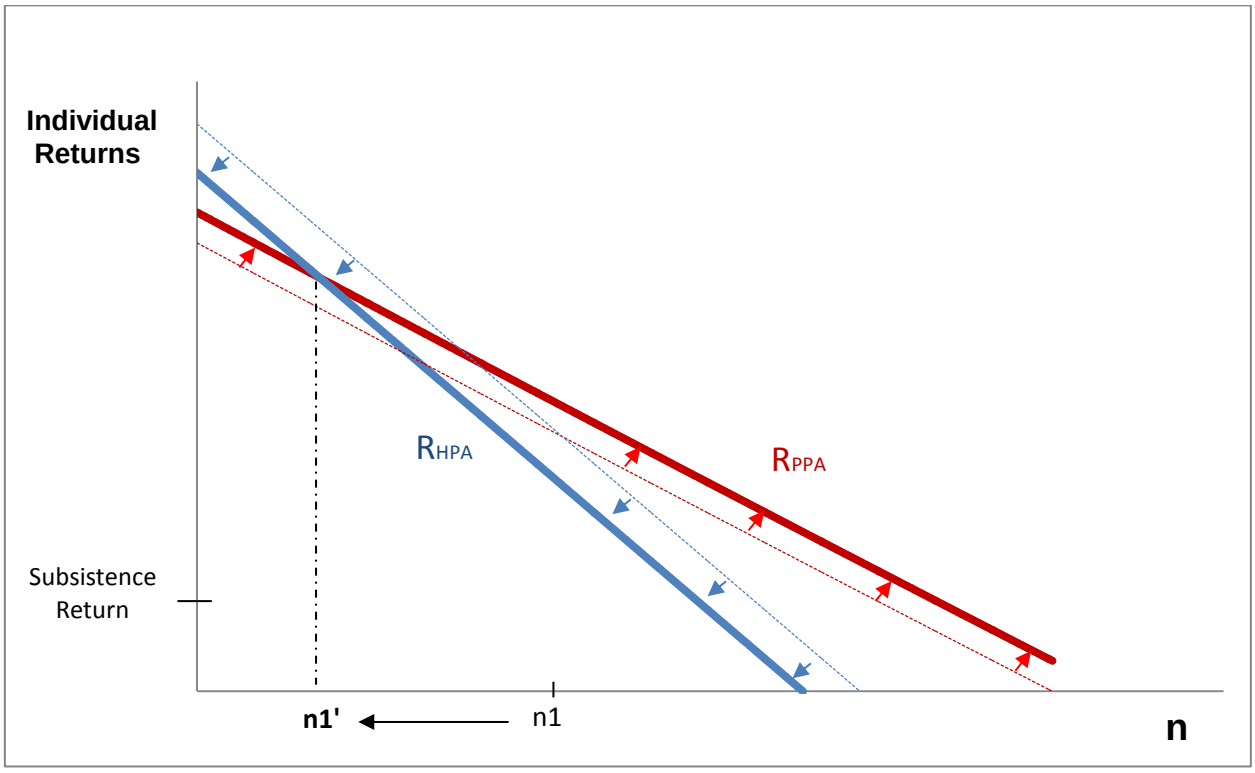
- Better informal institutions will increase β_1 and decrease β_2, shifting the R_{HPA} curve outwards and the R_{PPA} curve downwards (graph 3.2).
- A deterioration of the informal institutions will have the opposite effect (graph 3.3).

Graph 3.2 –Better Informal Institutions (Same Formal Institutions)



Source: own elaboration.

Graph 3.3 –Worse Informal Institutions (Same Formal Institutions)

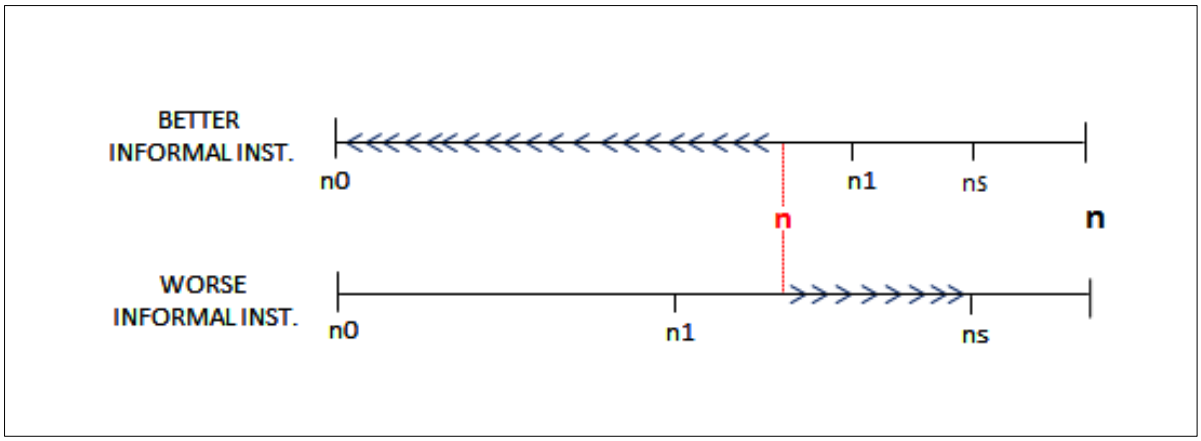


Source: own elaboration.

It is clearly appreciated that better informal institutions lead to a bigger interval: $[n_0, n_1)$, where the proportion of individuals engaged in Poorly Productive Activities tends to cero ($n \rightarrow n0$).

The role of informal institutions is thus crucial: for the same proportion of individuals engaged on Poorly Productive Activities (same n), an economy may enter a virtuous circle of increasing HPAs or a vicious circle of increasing PPAs depending on the quality of its informal institutions. This is clearly shown in graph 3.4:

Graph 3.4 –The Importance of Informal Institutions (Same Formal Institutions)



Source: own elaboration.

Hence, we can expect that countries (with common Formal Institutions and Enforcement characteristics) with better informal institutions have higher proportions of HPAs in their economies and are, thus, more productive.

Proposition – The interaction of Common Formal Institutions and their Enforcement characteristics with better Informal Institutions results in higher productivity levels

Economic theory recognises the increase in productivity as the main engine of long-term economic growth[10].

[10] Intensive Economic Growth (the increase in per capita income) will only persist over time if it is based on productivity growth (there is a limit to employment rate growth): $\frac{Y_t}{P_t} = \frac{Y_t}{L_t} \cdot \frac{L_t}{P_t}$

4. DATA

4.1 EUROPEAN INFORMAL INSTITUTIONS INDEX (*EU-INFORM*)

As shown in the previous section, informal institutions' effect on productivity and economic growth is contingent to the institutional arrangement to which they belong. Analysing the effect of Informal institutions per se is, thus, not accurate. To evaluate the importance of informal institutions, it is necessary to consider a variable that measures the quality of "the interaction of different Informal Institutions with Common Formal Institutions and Enforcement Characteristics". I built this variable by focusing in a "quasi-natural experiment": The EU-15 Area[11]:

I consider the four indices on economic institutional quality developed by Kaufmann, Kraay and Zoido-Lobatón[12]. i.e.: government effectiveness, regulatory quality, rule of law and control of corruption. These indexes are based on perceptions (ratings by country experts and surveys) and thus, intrinsically consider the interaction of Formal and Informal institutions. E.g.: A citizen's perception of the extent to which public power is exercised for private gain is surely influenced by the existing anti-corruption laws (Formal Institutions) but also by his/her view of public graft as an accepted and shared business behaviour (Informal institutions). I aggregate these 4 governance dimensions into a single indicator of Economic Institutional Quality.

The EU-15-Area is a quasi-natural experiment in the sense that all its members have been, during the past 19 years, required to adopt very similar Formal Institutions[13]. As shown in figure 4.1.1., they are subject to common formal rules and organizations.

Figure 4.1.1 – Euro-Area Common Formal Institutions

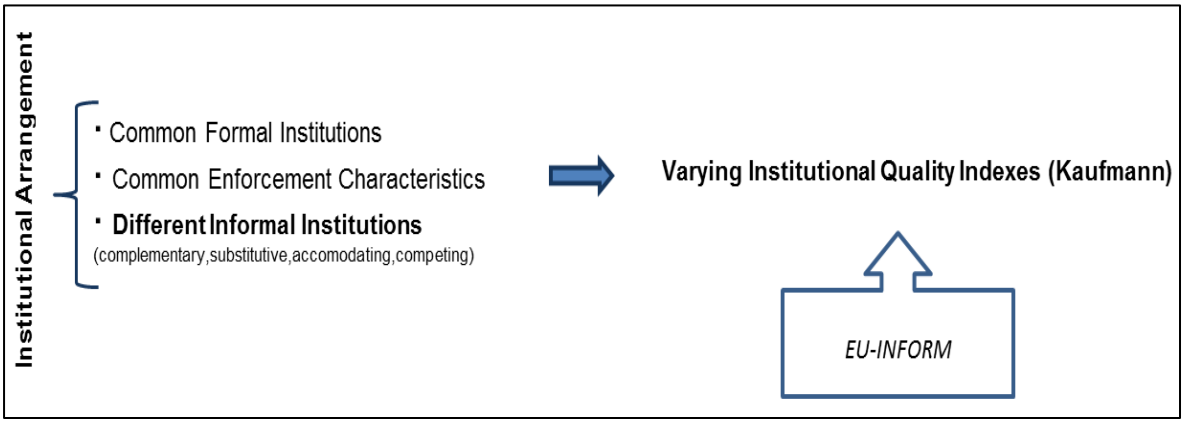
European Union	COMMON WRITTEN RULES	COMMON ORGANIZATIONS
	• Laws • Fundamental Rights • Membership Conditions	• Parliament • Councils • Commission • Court of Justice • Central Bank • Other

Source: Own elaboration based on the "Official Journal of the European Union".

[11] The EU-15 Area includes the States that have been members of the European Union since 1995. i.e.: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom.
[12] For further information on these indexes you may refer to: www.govindicators.org
[13] For further information you may refer to the "Official Journal of the European Union".

As a result, the differences in each country's Economic Institutional Quality Indicator (after having controlled for their enforcement capacity) can be attributed to the differences in their informal institutions (might be complementary, substitutive, accommodating or competing). Hence, this index captures the quality of "the interaction of different Informal Institutions with the Common European Formal Framework". I will call the corresponding variable: *EU-INFORM*.

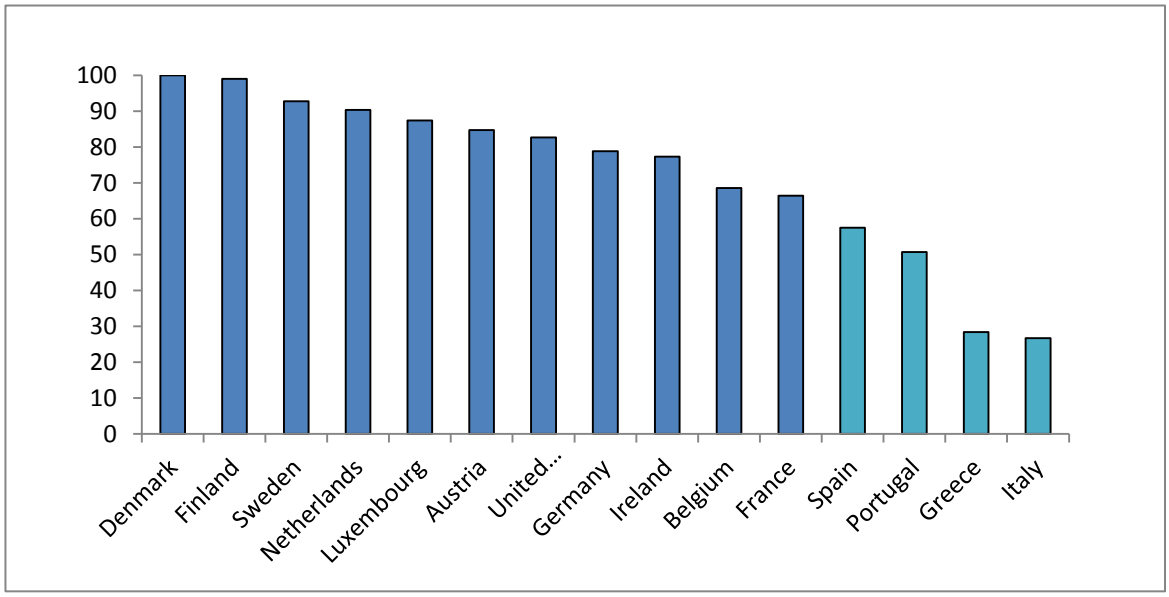
Figure 4.1.2 – *EU-INFORM*



Source: Own elaboration.

As shown in Graph 4.1.1, there are great differences in the EU countries' index. Spain, Portugal, Greece and Italy have the worse informal institutions.

Graph 4.1.1 – Normalised Average *EU-INFORM* from year 2000 to year 2012



Source: Own elaboration.

4.2 MEASURES OF PRODUCTIVITY

The most used measure of the productivity of an economy is Labour Productivity: the average output produced by unit of labour.

$$Labour\ Productivity = \frac{Y(GDP)}{L\ (Labour\ Input)}$$

Nonetheless, it has clear limitations. E.g.: An economy may experience a higher labour productivity during a recession without having improved its production practices - a larger reduction in its labour force than in its GDP during the struggle would generate this result. It is, thus, interesting to consider other measures of productivity that better capture the extent to which an economy produces efficiently.

Labour Productivity per hour

Labour Productivity per hour is a preferred measure of productivity as it measures labour intensity more adequately. E.g.: during a recession the labour force may be reduced but its total working hours might be kept unchanged. In this situation, the Labour productivity per hour ratio would correctly suggest that no real productivity improvement has taken place.

$$Labour\ Productivity\ per\ hour = \frac{Y(GDP)}{H(Total\ Hours\ Worked)}$$

The source of the data on labour productivity per hour used in this dissertation's empirical study is: The Conference Board Total Economy Database™, January 2014, http://www.conference-board.org/data/economydatabase/.

Hausmann EXPY

Expy is a measure of the productivity level of a country associated to the specialization patterns and degree of sophistication of its exports[14].

The source of the data EXPY used in this dissertation's empirical study is: What you export matters – http://www.hks.harvard.edu/fs/drodrik/research.html (Dani Rodrik Home-Page)

[14] For further information you may refer to: Hausmann, R., Hwang, J. & Rodrik, D. 2006. "What You Export Matters", National Bureau of Economic Research, Working Paper.

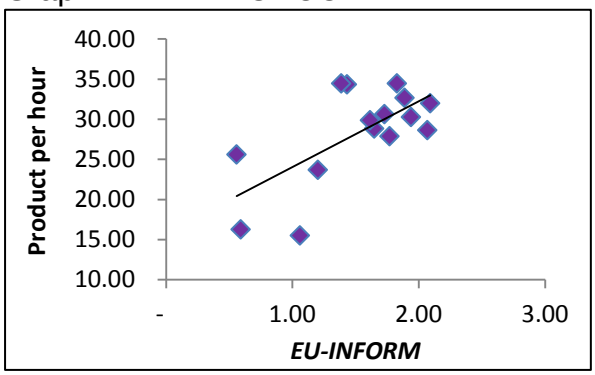
Penn Table TFP (Total Factor Productivity)

The TFP is another measure of productivity. It is the average output produced by a combination of multiple inputs (including labour and Capital) adjusted for changes in the quality of labour or the composition of capital.

The source of the data on TFP used in this dissertation's empirical study is: Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 8.0, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, Nov 2012.

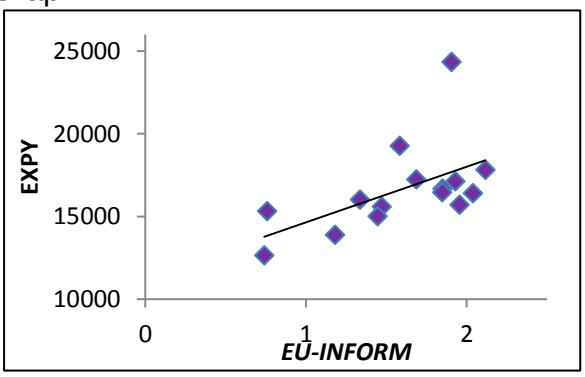
The following graphs depict the relation between the different measures of productivity and *EU-INFORM*. They have been elaborated using averages. It seems clear that better informal institutions leading to better institutional outcomes (Higher EU-INFORM) are associated with higher productivity levels.

Graph 4.2.1 - PRODUCT PH



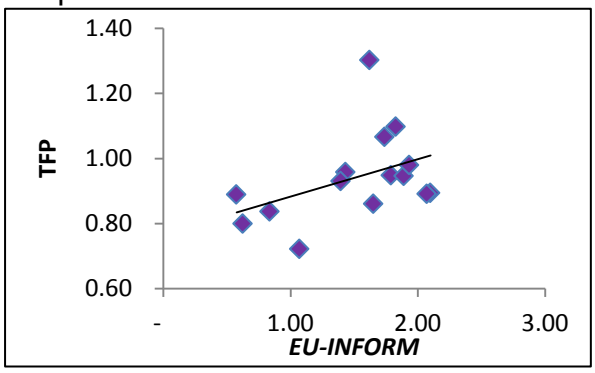
Source: Own elaboration.

Graph 4.2.2 - EXPY



Source: Own elaboration.

Graph 4.2.3 - TFP



Source: Own elaboration.

5. MODEL SPECIFICATION

The objective of the empirical study is to test the proposition derived from the theoretical model. i.e.: *The interaction of Common Formal Institutions and their Enforcement characteristics with better Informal Institutions results in higher productivity levels*.

In order to do so, the starting point is the following general equation:

$$PRODUCTIVITY\ MEASURE = \alpha + \beta\ EU.INFORM + \gamma\ ENFORCEMENT\ CAPACITY\ PROXY + \varepsilon \quad (1)$$

Measures of productivity are used as dependent variables; proxies for countries enforcement capacity are included as control variables; only the data from the EU-15 countries is considered.

As a result, the theoretical model's proposition can be assessed by studying the equation's (1) coefficient on $EU.INFORM$ - "β" captures the effect on productivity of changing the quality of informal institutions when countries have the same European Common Formal Institutions and enforcement capacity. If this dissertation's proposition were to be true, β should be positive and statistically significant.

In the presence of endogeneity (omitted variables in the error term correlated with $EU.INFORM$), the estimates of β will be biased. The most likely source of endogeneity is bidirectional causation: The positive correlation between $EU.INFORM$ and productivity might be due to the fact that countries with higher productivity have higher GDPpc and, thus, more resources and to improve the quality of their informal institutions. Nonetheless, it is felt that by controlling for each countries enforcement capacity, the source of bias is being effectively removed: the omitted variable causing the bias is being included as a control variable. Besides, there could also be endogeneity regarding the relation between productivity and the European Formal Institutions. Nonetheless, the latter is implicitly assumed exogenous and equal for all countries.

As already mentioned, the sample is composed of the 15 members that integrated the European Union in 1995. Each "country-year" is an observation. The data considered is from year 2000 onwards[15] as it is felt that by then all the EU-15 countries should have had enough time (5 years) to implement the common formal European institutions.

[15] From 2000 onwards all observations available are included. No data on *EU-INFORM* for 2001 was found.

In order to increase the robustness of the study, several measures of productivity have been used:

$$PRODph = c + \beta\ EU.INFORM + \gamma ENFORCEMENT.PROXY + \varepsilon$$

(2)

The first regression uses productivity per hour as the dependent variable. It considers the EU-15 countries for years 2000 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 and 2012. The model (2) is estimated by OLS using the sample of 180 observations.

$$EXPY = c + \beta\ EU.INFORM + \gamma\ ENFORCEMENT.PROXY + \varepsilon$$

(3)

The second regression uses EXPY as the dependent variable. It considers the EU-15 countries for years 2000 2002 and 2003. The model (3) is estimated by OLS using the sample of 45 observations.

$$TFP = c + \beta\ EU.INFORM + \gamma\ ENFORCEMENT.PROXY + \varepsilon$$

(4)

The third regression uses Total Factor Productivity at PPP as the dependent variable. It considers the EU-15 countries for years 2000 2002 2003 2004 2005 2006 2007 2008 2009 2010 and 2011. The model (4) is estimated by OLS using the sample of 165 observations.

Two proxies for the enforcement capacity of countries have been considered: GDP per capita at PPP ($GDPpcppp$) and General Government Revenue as a percentage of GDP ($GOVREV$)[16]: It can be expected that richer countries have a greater enforcement capacity. In this sense, $GDPpcppp$ is a good proxy. Nonetheless, it will probably capture all the effect that $EU.INFORM$ exercises on productivity making β statistically insignificant. Alternatively, General Government Revenue as a percentage of GDP can serve the purpose. Governments with greater revenues have, in principle, more means to apply the law.

[16] Using the degree of obedience of the law to characterize the enforcement capacity of a country would not make sense as it does not only depend on the enforcement capacity of the country, but also on other factors such as the nature of its informal institutions.

6. EMPIRICAL RESULTS AND INTERPRETATION

Table 7.1. - OLS Results: *GDPpcppp* as Control Variable

Dependent Variable	Independent Variable	Estimate (OLS)
PRODUCTIVITY PER HOUR	***EU-INFORM***	**3.125060***** (0.716418)
	Observations: Adjust. R-squared:	180 0.618411
EXPY	***EU-INFORM***	**105.3917** (543.8908)
	Observations: Adjust. R-squared:	45 0.780460
TFP	***EU-INFORM***	**0.020094** (0.025096)
	Observations: Adjust. R-squared:	165 0.312129

Note: *** means the coefficient is statistically significant at 1% level, ** at 5% level and *at 10% level.
Note: The quantities in parenthesis below the estimates are the standard errors.

Table 7.1 summarizes the estimates of the effect on productivity obtained when GDP per capita at purchasing power parity is used to control for countries' different enforcement characteristics. Even though all the coefficients have the expected (positive) sign, as it was anticipated not all of them are statistically significant (not even at the 10% level). When the dependent variable is *EXPY* or *TFP*, the hypothesis that *EU-INFORM* has no effect on productivity cannot be rejected. However, in all cases, the coefficient on the proxy for enforcement capacity (*GDPpcppp*) is statistically significant[17]. These results would support the thesis that when formal institutions are common to the countries considered, their different enforcement capacities (not their informal institutions) will be what determine their different institutional quality and productivities. Nonetheless, it is seriously felt that this conclusion is not precise. As it was previously explained, the proxy used for a country's enforcement capacity, *GDPpcppp*, is very affected by *EU-INFORM*. As a matter of fact, *GDPpcppp* depends to some extent on informal institutions. Therefore, it was predictable that once we controlled for it, the effect of *EU-INFORM* would be artificially set to zero.

[17] You may refer to Annex 3 to check the Eviews tables with the results.

In this context, a second set of regressions should be run using a proxy for enforcement capacity that is not affected by informal institutions.

Table 7.2. - OLS Results: *GOVREV* as Control Variable

Dependent Variable	Independent Variable	Estimate (OLS)
PRODUCTIVITY PER HOUR	***EU-INFORM***	**7.124490***** (0.781453)
	Observations: Adjust. R-squared:	180 0.394875
EXPY	***EU-INFORM***	**3876.905***** (846193)
	Observations: Adjust. R-squared:	45 0.302456
TFP	***EU-INFORM***	**0.183954***** (0.022835)
	Observations: Adjust. R-squared:	165 0.314094

Note: *** means the coefficient is statistically significant at 1% level, ** at 5% level and *at 10% level.
Note: The quantities in parenthesis below the estimates are the standard errors.

Table 7.2 summarizes the estimates of the effect on productivity obtained with each productivity measure when General Government Revenue (as a percentage of GDP) is used to control for countries different enforcement characteristics. All have the expected (positive) sign and are statistically significant at the 1% level. These results support this dissertation's proposition. The coefficient on the proxy for enforcement capacity is (except in the EXPY regression which it nearly is) still significant[18]. Nonetheless, it is clearly smaller than the coefficients on *EU-INFORM* and in some cases even negative (obtaining higher general government revenues may generate inefficiencies leading to lower productivities).These results confirm that, although the enforcement capacity of countries is important to determine their different institutional quality and productivity (when they all have the same formal institutions), informal institutions are more relevant. E.g.: It might be the case that a country has many means to ensure that the law is applied but that these resources are misused due to the existence of "bad"· informal institutions (such as generalised corruption within public servants).

[18] You may refer to Annex 3 to check the Eviews tables with the results.

7. IMPLICATIONS AND FURTHER DISCUSSION

The study of informal institutions is an incipient research field in economics. This dissertation suffers from limitations but also sets the basis for possible future lines of investigation.

Amongst its limitations, the clearest one is the strong explicit assumption that the EU-15 countries have a common Institutional Formal Framework (the premise of this study) and the implicit supposition that this framework is "good".

Furthermore, even though the theoretical model provides useful insights on the functioning and the rationale of the impact of informal institutions on growth, it is still not complex enough to completely capture its nature: Institutional quality is portrayed as a parameter when it is probably in itself an endogenous variable of the model; the returns of the agents are depicted in a linear manner (it might have been more precise to consider quadratic curves instead); the way in which institutional quality affects the relative returns is very simplified. Developing a theoretical model on the rationale of institutions remains one of the greatest challenges of institutional economics.

Finally, the econometric analysis consistency is subject to the accuracy of the assumptions made. Our estimators will be biased if any of the latter are not satisfied (this is probably the case as the residuals do not satisfy the desired properties). In addition, it would have been better to have a larger number of observations.

Despite these restrictions, the dissertation provides a thorough analysis of the nature of informal institutions going through certain misconceptions that the literature has made. It stresses their importance and the relevance of not neglecting the context in which they operate. By using specific measures of productivity as dependent variables, this paper avoids the misinterpretations that could arise due to temporal growth episodes based on artificial bubbles.

The most important contribution of the dissertation is probably the use of a new strategy to study the impact of informal institutions on economic growth: focusing on countries/Autonomous Communities/Provinces with similar Formal Institutions, in order to evaluate the differences in their growth trends generated by their different informal institutions. Given the difficulties that arise when applying traditional econometric analysis to institutional economics (e.g.: bidirectional causation), this new method gains importance.

Using the latter approach, it has been proved that the interaction of Common Formal Institutions and their Enforcement characteristics with better Informal Institutions results in higher productivity levels. Furthermore, the results suggest that the enforcement capacity of a country is not as important as the nature of

its informal institutions. In other words, a “good” Formal Institutional Framework may not lead to a good institutional outcome even if the country that is implementing it has sufficient resources to enforce it, given that its informal institutions are generating conflicting incentives. The latter has clear implications:

To start off, it is felt that more emphasis should be put into the study of informal institutions in the future. Even though they are much more complex to analyse, informal institutions are probably even more important than formal institutions. In this context, it would be interesting to perform case studies on different countries in order to gain more knowledge on them.

Secondly, now that the results have proved that informal institutions are a fundamental cause of differences in productivity between countries and, thus, of differences in long-term economic growth, it seems interesting to revise how a country’s institutional quality should be improved. As it has been asserted in this dissertation, institution´s quality is contingent to a country’s local conditions. Formal institutions that have been well-proven in certain countries should not be transferred to another country which might have different informal institutions. This past “miraculous” development strategy would probably not succeed (this is the case of the South of Europe). Then, what should be done instead?

In this aspect I coincide with Rodrick’s viewpoint (Rodrik et al, 2004): efficiently implementing small realistic reforms that do not encounter great social opposition should be the way to proceed. By the same rationale that bad informal institutions lead to the proliferation of more non-desirable informal institutions, this small reforms can make the economy enter a virtuous circle. Both informal and formal institutions will evolve in the same way. Gradually the Economy’s incentives will improve and its progress will foster further improvements. This policy is compatible with the dissertation´s theoretical model and results.

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9. ANNEX

9.1 THE SOLOW MODEL AND THE DATA[19]

The product per worker is around 15 to 20 times higher in rich countries than in poor countries.

- I assume that rich countries' savings rate is 3 times higher than poor countries' savings rate.
- I assume that rich countries' population growth rate is 0.5% and poor countries population growth rate is 3%.

Both assumptions are made with the intention of favouring the explanatory capacity of the Solow Growth Model.

In steady state, product per worker depends on the: savings rate s, population growth rate n, depreciation δ, technological progress g and the exogenous parameter A_t.

$$yct = \left[\frac{s}{n+\delta+g}\right]^{\frac{\alpha}{1-\alpha}} A_t$$

Assuming that the previous expression applies to rich R and poor P countries and that α, δ and g are equal for both groups, taking logarithms we obtain that:

$$\ln\frac{y_R}{y_p} = \frac{\alpha}{1-\alpha}\left[ln\frac{s_r}{s_p} - ln\frac{n_r+\delta+g}{n_p+\delta+g}\right]$$

With $\alpha = \frac{1}{3}$, $\delta = 0.07$ and $g = 0.015$ the differences in s and n imply a product per worker 1.96 times higher in rich countries than in poor. This figure is far away from the 15 to 20 multiple that is appreciated in the real data.

The greatest part of the differences in product per worker between rich and poor countries is explained by their differences in the exogenous parameter A.

[19] This demonstration is based on the lectures held by the professor of Universidad Complutense de Madrid Carlos Sebastián.

9.2 THEORETICAL FRAMEWORK: GRAPHICAL ANALYSIS

The graphical analysis was performed assuming that:

- $C(X) = c_o + \frac{1}{2} c_1 X^2$
- $L(n) = [\gamma + X]$
- q to be small
- $R_{PPA} = [1 - n\,] \cdot L(n)$

Eq. (1) became: $R_{HPA} = [1-n]\left[\frac{[1-n]}{2c_0}\right] - \frac{[1-n]^2}{2c_0} - c_1 + \beta_1$

Eq. (2) became: $R_{PPA} = [1-n]\left[\gamma\alpha + \frac{\gamma[1-n]}{2c_0}\right] + \beta_2$

So that **Eq. (3)**: $[1-n]\left[\frac{[1-n]}{2c_0}\right] - \frac{[1-n]^2}{2c_0} - c_1 + \beta_1 = [1-n]\left[\gamma\alpha + \frac{\gamma[1-n]}{2c_0}\right] + \beta_2$

Table 9.2 – Parameters used for the Graphical Representation

		INFORMAL INSTITUTIONS	
	Initial Situation	Improvement	Deterioration
B1	**0**	**0.7**	**-0.7**
B2	**0**	**-0.5**	**0.5**
Alfa	12	12	12
C0	2	2	2
C1	2.7	2.7	2.7
Gamma	0.6	0.6	0.6

Limitations of the Graphical Representation

- It has been assumed that the Return Curves are linear functions of n. This is probably not the case. Nonetheless, this simple version still allows us to draw accurate conclusions on the relative returns of HPAs to PPAs (which is the analysis' purpose).

- The way in which the institutional quality affects the Returns of HPAs and PPAs (through β_1 and β_2) has been extremely simplified.

9.3 RESULTS (EVIEWS TABLES)

Dependent Variable: PRODUCTPH
Method: Least Squares
Sample: 1 180

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.657019	1.185281	7.303768	0.0000
EUINFORM	3.125060	0.716418	4.362064	0.0000
GDPPCPPP	0.000677	6.49E-05	10.42369	0.0000

R-squared	0.622675	Mean dependent var	28.32900
Adjusted R-squared	0.618411	S.D. dependent var	5.889342
S.E. of regression	3.638016	Akaike info criterion	5.437280
Sum squared resid	2342.623	Schwarz criterion	5.490496
Log likelihood	-486.3552	Hannan-Quinn criter.	5.458857
F-statistic	146.0457	Durbin-Watson stat	0.231471
Prob(F-statistic)	0.000000		

Dependent Variable: EXPY
Method: Least Squares
Sample: 1 45

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6257.631	876.6414	7.138188	0.0000
EUINFORM	105.3917	543.8908	0.193774	0.8473
GDPPCPPP	0.492110	0.049469	9.947883	0.0000

R-squared	0.790439	Mean dependent var	16625.46
Adjusted R-squared	0.780460	S.D. dependent var	2632.957
S.E. of regression	1233.675	Akaike info criterion	17.13772
Sum squared resid	63922024	Schwarz criterion	17.25817
Log likelihood	-382.5988	Hannan-Quinn criter.	17.18262
F-statistic	79.20956	Durbin-Watson stat	1.217414
Prob(F-statistic)	0.000000		

Dependent Variable: TFP
Method: Least Squares
Sample: 1 165

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.576883	0.043124	13.37740	0.0000
EUINFORM	0.020094	0.025906	0.775643	0.4391
GDPPCPPP	1.52E-05	2.33E-06	6.510300	0.0000

R-squared	0.320517	Mean dependent var	0.941180
Adjusted R-squared	0.312129	S.D. dependent var	0.151189
S.E. of regression	0.125393	Akaike info criterion	-1.296716
Sum squared resid	2.547184	Schwarz criterion	-1.240244
Log likelihood	109.9791	Hannan-Quinn criter.	-1.273792
F-statistic	38.20837	Durbin-Watson stat	0.337014
Prob(F-statistic)	0.000000		

Dependent Variable: PRODUCTPH
Method: Least Squares
Sample: 1 180

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.81167	2.444790	5.240399	0.0000
EUINFORM	7.124490	0.781453	9.116978	0.0000
GOVREV	0.103343	0.058398	1.769633	0.0785

R-squared	0.401637	Mean dependent var	28.32900
Adjusted R-squared	0.394875	S.D. dependent var	5.889342
S.E. of regression	4.581305	Akaike info criterion	5.898371
Sum squared resid	3714.939	Schwarz criterion	5.951587
Log likelihood	-527.8534	Hannan-Quinn criter.	5.919948
F-statistic	59.40341	Durbin-Watson stat	0.227922
Prob(F-statistic)	0.000000		

Dependent Variable: EXPY
Method: Least Squares
Sample: 1 45

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	14198.56	2281.657	6.222915	0.0000
EUINFORM	3876.905	846.6193	4.579278	0.0000
GOVREV	-82.40722	53.58784	-1.537797	0.1316

R-squared	0.334162	Mean dependent var	16625.46
Adjusted R-squared	0.302456	S.D. dependent var	2632.957
S.E. of regression	2199.023	Akaike info criterion	18.29375
Sum squared resid	2.03E+08	Schwarz criterion	18.41420
Log likelihood	-408.6095	Hannan-Quinn criter.	18.33865
F-statistic	10.53921	Durbin-Watson stat	0.708649
Prob(F-statistic)	0.000195		

Dependent Variable: TFP
Method: Least Squares
Sample: 1 165

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.157229	0.069597	16.62763	0.0000
EUINFORM	0.183954	0.022835	8.055747	0.0000
GOVREV	-0.010993	0.001677	-6.555126	0.0000

R-squared	0.322459	Mean dependent var	0.941180
Adjusted R-squared	0.314094	S.D. dependent var	0.151189
S.E. of regression	0.125214	Akaike info criterion	-1.299578
Sum squared resid	2.539906	Schwarz criterion	-1.243106
Log likelihood	110.2152	Hannan-Quinn criter.	-1.276654
F-statistic	38.54996	Durbin-Watson stat	0.253028
Prob(F-statistic)	0.000000		