Democracy, Political Stability and Economic performance. A Panel Data Analysis

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Abstract

In the present paper we undertake to link political stability under democracy with a set of indicators for economic freedom and financial crises, using panel data analysis. The sample covers annually the period 2000-2012 for selected European Union (EU) member-states, USA and Japan. The results support our main thesis, that political stability in democratic regimes is positively related to the set of economic freedom indicators and negatively to financial crises, because greater economic freedom influences positively investment and economic growth, while financial crises, which lead to austerity policies, which again lead to recession-depression, increase dissatisfaction among citizens with the workings of democracy and thus, to the rise of extremist parties. Our findings support the idea that political stability in democratic regimes is linked to economic stability and growth and vice-versa.

1   Introduction

Democracy and political stability are linked from ancient through to modern times. Historically, stable and durable democracies, either at single state level or for federations, are linked to stable, prosperous and growing economies. The first well- established democracy, that of ancient Athens, was based on a well-functioning and prosperous

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economy which permitted the establishment of a substantial state budget. This covered, for the first time in history, not just military expenses, but programs of public works (primarily during two periods, that of Pericles during the second half of the 5th century, and of Lycurgus during 338-323 BC), education and participation fees for the democratic bodies (Amemiya, 2007; Ober, 2008).

Through the ages, one can mention much more modern paradigms, by starting for example, with the United Provinces (UP, also known as the Dutch Republic) and England after the Glorious Revolution of 1688. The UP were characterised by a mixed political system, democratic at the federation and provinces level, aristocratic at the base, cities level (Davids and 't Hart, 2012).[1] These two historical cases, which are considered to be two of the first early modern European states which achieved economic growth, were again based on a free market economy, international commerce, property rights protection, stable political systems (during the 18th century), functional and trustworthy (in value) coins and innovative institutional mechanisms, such as the first ever recorded functional joint stock companies, banking services and the stock market (Schmitthoff, 1939;Lawson, 1993, p. 53; Gauci, 2000;Gelderblom, 2003; Acemoglu, Johnson and Robinson, 2005; Munro, 2007; Van Nieuwkerk, 2009; Roy, 2012). Modern paradigms, which relate political democracy with a relatively prosperous economic environment, include among others, the US, the EU, Norway and Japan, the case studies statistical data of which we will use to test our model later.

There is a literature by both economists and political thinkers such as Hayek (1973), Rawls (2005) and Weithman (2013) which relates democracy with economic market mechanisms and economic growth. On the other side, there are many examples which show that economic crises linked to political instability and in some cases, to the fall of democracy, as with the case of Germany, just after World War I, where the huge martial allowances that the German state had to undertake as a result of the Versailles Peace Treaty in 1919, combined with the erosion of the reichsmark's value and the increasing rates of unemployment, finally lead to the rise of the Nazis after winning the elections of 1933. Ex-WWII cases include some Latin American countries, as for example, the fall of Allende and the military dictatorship in Chile in 1973.

Economic crises or recessions contributed to the breakup of federations in modern times, as the fall of the Soviet Union after 1989 and the collapse of Yugoslavia and Czechoslovakia testify. The dissolution of these three federal cases made apparent another aspect of political stability and economy: The deterioration of a states' economy erodes the political foundations of a state regardless of whether this state applies market economy mechanisms (such as the case of the Weimar Republic) or not (such as the central economic planning in the USSR, Yugoslavia and Czechoslovakia).

This paper is organized as follows: In the next section we offer further more recent argumentation concerning the link between democracy and economic performance. Then we proceed to the discussion which relates political stability in democratic regimes with a stable and prosperous economy and vice versa, that is, political instability or crisis finally leads to economic inefficiencies. We offer arguments in favour or against such an

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[1] For the transformation of the Dutch and the English economy towards free market and international commerce since the late 16th century, which further deepened after the Glorious Revolution in England see, among others (North and Weingast, 1989; de Vries and van der Woulde, 1997; Rodger, 1997; Munro, 2007; Kyriazis and Metaxas, 2011; Roy, 2012).

argumentation based on the international scholarship literature. Then, we proceed with our own econometric analysis with data from a variety of countries from three different continents, including 15 EU members states, Norway, USA and Japan so that our findings will have a more global character.

2   Democratic regimes and economic performance

There is a vast bibliography which relates democratic regimes with economic performance. According to this perception, democratic procedures such as collective decision making and the efficient implementation of property, civic and political rights in practical terms can lead to economic development, if efficiently combined with market economy (Friedman, 1961; von Mises, 1981; Riker and Weimer, 1993). As Lipset (1959, p. 56) characteristically argued "*the more well to do a nation, the greater the chances it will sustain democracy*". But in order to flourish, it must be accompanied by proper institutional arrangements which favour political liberalism (Hayek, 1973; North and Thomas, 1973; North, 1981, 1990; Menard and Shirley, 2008, Acemoglu and Robinson, 2012).

However, there are also some different views such as those of Nelson (1991, p. 275) and Przeworski and Limorgi (1993) who provide a survey of 18 studies with mixed results, connecting democracy or autocracy with economic growth, argue that economic development is not determined by the kind of political regime (democratic or absolutist) which controls the authority in a state but by a series of institutional factors such as property rights protection. Alesina and Perroti (1997, p. 21) add to this view that a state's growth is mostly determined by the stability of the political system towards time (regardless of being democratic or non), which has to do with its propensity to military coups or major changes in government structures.

The above three arguments are counterbalanced by Olson (1993) and Epstein (2000) who admit that although under specific terms an authoritarian government can be capable to securitise property rights in the short term, finally, in the long term it is incapable of persuading investors to participate in the nation's economic activity. Acemoglu and Robinson (2006) argue that citizens, if they have the ability to choose, prefer democracy because it is consistent with collective decision making whereas under autocracy, there is a monopolization of power in the hands of a very few privileged people. Autocracies can become predatory, since there is no one to control the autocrat (Olson, 1991). Olson (1993, p. 572) adds to this view that only in democratic societies, where property rights are protected, can growth become sustainable from one generation to another without any interruption, because in democratic societies the possibility of abusing property rights is lower comparing to autocratic regimes.[2] These findings are also supported by Chaudry and Garner (2006) and Karayalçin (2008). Nelson and Singh (1998), by making use of data from the Gastil's Democracy Index, have found a positive correlation between democracy and growth.

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[2] Furthermore, the existence of an efficient environment of property rights protection is also very important for economic development. See among others, Furubotn and Pejovich, 1972; Alchian and Demsetz, 1973; North and Thomas, 1973; North, 1978, 1981, 1990, North and Weingast, 1989; La Porta, et al., 1997; Glaeser et al., 2004; Menard, 2014).

Przeworski and Limongi (1993) found that most studies published after 1987 show a positive link between democracy and growth, whereas earlier studies generally indicated that authoritarian regimes grew faster. Furthermore, Feng (1997) who, through an econometric approach, analysed ninety-six countries from 1960 to 1980 found that the existence of democracy had a positive indirect effect upon growth. He also found that long run economic growth tends to exert a positive effect upon democracy. These findings are similar to those of Przeworski et al. (2000) who, based on a vast sample of data set covering most of the countries in the world from 1950 to 1990, found that democracy outperforms authoritarianism when it comes to economic performance.

These views are again verified by more recent research by Tavarez and Wacziarg (2001), Rodrik (2000), Rodric and Wacziarg (2005) and Papaioannou and Siourounis (2008) who have argued that democratically elected governments tend to outperform authoritarian regimes in a number of ways: they are better at adjusting external shocks, they provide greater stability and predictability and they produce better social indicators and distributional results.

3   The interrelation between political stability or political crisis with economic performance

The above results which relate democratic regimes with the economy sound logical. But in order for a democratic political regime to flourish, it needs a strong and stable government. Political stability is vital since both domestic and foreign investors need a stable environment in order to invest in a country. They need to know about the status of property rights, if state authorities are capable and wish to securitise fair competition concerning business activity and if the taxation system is stable, meaning that it does not change frequently. This is important because when would-be investors wish to undertake prospective business plans, which include investment costs, they need to be able to make a relative estimation in advance as far as expected revenues, costs and profits are concerned.

As Blanco and Grier (2009, p. 76) put it, political instability reduces the incentive to accumulate physical capital. Investors will postpone new capital projects and wait until the policy environment clarifies, or move their money abroad. This view is consistent with earlier studies which verify that political instability affects investment significantly (Ozler and Rodrik, 1992; Alesina and Perroti, 1996). Political uncertainty and instability does not only hinder investment policies but also results in lower national growth rates and causes slower economic development (Rodrik, 1991; Barro, 1991;Alesina, et al. 1992 and de Haan and Siermann, 1996). Aisen and Vega (2010) add on this that political instability is likely to shorten policymakers' horizons leading to suboptimal short term macroeconomic policies. It may also lead to a more frequent switch of policies, creating volatility and thus, negatively affecting macroeconomic performance.

A series of further studies tends to prove the relation between economic performance and political stability. Alesina et al. (1996), by analyzing a sample of 113 countries for the period 1950-1982, found that countries with a high propensity for government collapse are related with significantly lower GDP growth than otherwise. In addition, Alesina and Perroti (1996) analysed a sample of 70 countries for the period 1960-85 and verified that

socio-political instability caused income inequality, which entailed social discontent increase. In addition, Perotti (1996), by utilizing data for the 1960-1985 period, investigated the relationship between income distribution, democratic institutions and growth and found out that countries with high income inequality are more likely to be politically and socially unstable, which is reflected in lower rates of investment and therefore growth.

Furthermore, Blomberg and Hess (2002), in order to estimate the joint determination of external conflict, internal conflict, and the business cycle, they made use of data from 152 countries from 1950 to 1992, and they found that political instability has a positive effect on low income growth, while Collier and Hoeffler (2004), by investigating the causes of civil war, using a new data set of wars during 1960–99, found that political instability is related to low economic performance. They also found that this relationship is bidirectional: when income is low or has a decreasing trend, the opportunity cost for an individual to rise up, protest or revolt is low. Maccullock (2005) by using data from the World Values Survey (taken in three waves from 1981 to 1995) and Eurobarometer Survey Series (taken annually between 1976 and 1990) found contradictory results concerning the impact of inequality which leads to political instability, revolt and conflict within a state.

Similar results were being found by Jong-A-Pin (2009) who implemented a panel data for a sample of 98 countries during the 1984-2003 period and found that the various dimensions of political instability had different effects on economic growth. Jong-A-Pin's results contradict those of Aisen and Vega (2010) who, by using data for 169 countries for a period between 1960 to 2004 found that political instability significantly reduces economic growth in both statistical and economic terms. Aisen and Vega also found that political instability is particularly harmful through its adverse effects on total factor productivity growth and, on a lesser scale, by discouraging physical and human capital accumulation. Furthermore, in another related study Agnello and Sousa (2013) using panel data on a sample covering 125 countries from 1980 to 2006, found that a higher level of political instability leads to an increase in public deficit volatility. Finally, the fact that the relationship between political instability and economic crisis applies also vice-versa is also verified by Geithner (2014) who found that financial crises have led to changes in governments and smaller or greater political instability, as in the cases of Mexico, Thailand, Indonesia and South Korea.

Economic recession after financial crises and slow economic growth and recession in many EU countries, have led to changes in governmental parties, as in today's Portugal, France, Italy, Cyprus and Greece, linked to the rise of extremist anti-European parties in France (Marin Lepen), the UK (Nigel Farage) and Greece (Golden Dawn political party).[3] In Greece, in particular, after the beginning of the crisis and depression of 2009, there have been four government changes and four elections (October 2009, twice in 2012 and January 2015) up to January 2015, eg. during a period of less than six years.

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[3] There is further substantial literature political instability to economic factors, such as, for example, taxation, usually in partial analysis. When taxation rises excessively, citizens gradually lose their trust in the political system and vice-versa (Dunning, 2005; Malhotra and Carnes, 2008; Kaufmann, Kraay and Mastruzzi, 2010; Estrada, Mutascu, and Tiwari, 2011; Mutascu, Estrada and Tiwari, 2012; Svensson, Urinboyev, and Astrom, 2012; Vasileiou, 2014).

4   The model

We use the Economic Freedom of the World - (EWF) Annual Report 2014, data for the 2000-2012 period provided by the Fraser Institute's databases, as a global approach because this is a composite index, being an average of many partial indices, measuring various economic and political aspects. The index comprises five main areas: 1) size of government, 2) legal system and property rights, 3) sound money, 4) freedom to trade internationally and 5) regulation, each area comprising again some sub-indices. We have analysed the EWF data for the following countries: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, UK, from the EU, as well as Norway, Japan and USA for data referring to the 2000-2012 period.

The size of government overall and bureaucracy costs in particular (sub-elements of regulation), affect not only the economic, but also the political situation. Bigger governments linked to non-transparent bureaucratic regulations and administrative requirements, frequent changes in taxation rules, lead to higher levels of fraud and corruption. This again reduces governments' legitimacy in the perception of their citizens which, in the longer run can be detrimental to democracy itself. As Learned Hand(1872-1961), a prominent American judge and avid supporter of free speech argued, "*freedom lives in the hearts of men and women. If it dies there, no law, no constitution can keep it alive*" (Dillliard, 1952). The same is true for democracy. If faith in democracy dies in the hearts of citizens, democracy will fall, as it did in Italy in 1922 and in Germany in 1933.

Referring now to the second criterion, the legal system, for example, induces as sub-indices judicial independence and impartial courts. We consider this to be a very important political (and not only economic) indicator, because it illustrates one of the basic foundations of modern democracy, the separation of powers, the legislative, executive and judiciary. Independent and impartial courts are a safeguard not only of property rights but of democracy itself, if they take a stand against political abuses by governments against their citizens. During periods of crises, governments tend to increase such abuses. Impartial courts (Constitutional courts where they exist) have put barriers against such abuses recently in Portugal, France, Greece etc., condemning government legislation in some cases as unconstitutional. In Greece, for example, the Supreme Administration Court (Greece does not have a Constitutional Court) has condemned many recent laws, as undemocratic-unconstitutional.

In fact there has never been before, after Greece's reestablishment of democracy in 1974, a situation in which so many laws have been declared unconstitutional during such a brief period (1974-2014). This substantiates our claim that abusive and undemocratic behavior by governments increase during periods of crises. Concerning sound money, this is an important criterion since, having stable money helps commercial transactions to take place with greater trust among buyers and sellers, thus leading to transactional cost reductions. Concerning our cases 13 out of 15 we analyse here utilizing the euro, which has a relatively fixed exchange globally, thus Eurozone members are benefited by it. The same has to do with the UK's pound, more or less with the Swedish crown, and the Norwegian krone and of course, with the American dollar.

The fourth criterion, freedom to trade internationally, that is, freedom of exchange across the globe, is a very important aspect of economic freedom. Many goods and

services are now either produced abroad or contain resources supplied from abroad and this procedure offers superior opportunities for emerging economies and developing countries.[4] Finally, the last criterion, regulation, comprises again some sub-indices, such as credit, labour or business market regulations. This criterion focuses on regulatory restraints that limit the freedom of exchange in credit, labor, and product markets such as if the state controls the banking system or not, labor-market regulations which may infringe on the economic freedom of employees and employers etc., such as minimum wages, dismissal regulations, centralized wage setting, extension of union contracts to nonparticipating parties and conscription.

4.1 Model Formulation

Our model can be presented by the next equation:

$$ps_{it} = c_0 + c_1 \cdot ts_{it} + c_2 \cdot crisis_{it} + error_{it} \tag{1}$$

Variable **[ps]** stands for the Political Stability Indicator. Variable **[ts]** stands for the total score index (WEF Indicators) through which we measure the economic performance of our 18 countries' statistical data. In other words, [ts] is an aggregate independent variable where it contains time series for each of the five sub criteria we have already taken into account (size of government, etc.).

Finally, **[crisis]** is a dummy variable representing the world economic–financial crisis having the value 0 in all years before 2008 and the value 1 for 2008 and afterwards. The subscript **i** stands for the country, while **t** for the year. As it has been already mentioned, our sample covers 15 out of 28 EU member-states, from all geographical regions (eastern, central and western Europe), as well as Norway, Japan and the United States for the period 2000 – 2012, based on data being extracted by the WEF by the Fraser Institute. Thus, the balanced sample has 234 observations in total. Equation (1) and all tests are elaborated through the Eviews software package.

4.2 Econometric Methodology[5]

Tables 1, 2 (see Appendix A) show that there is no unit root (1). This means that all variables are stationary and can estimate the model. The detailed results are shown in Table 3, while the diagnostics are shown in Table 4 (see Appendix B).

For Equation (1) there are basically two types of estimation method, the "fixed" and the "random" effects. The appropriate choice depends on whether one treats α_i's as some fixed numbers or 'random drawings' from a specific distribution. As the correlation

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[4]For a recent approach to the issue see, among others, Vegh (2013). However, there are also some estimations which argue that open trade policies are not always significantly associated with economic growth.

[5] The methodology we provide here is based on Baltagi (2001), Davis (2002), Gujarati (2003) and Halkos (2003).

structure of the error term is ignored, a more efficient estimation method would be the Generalized Least Squares (GLS) provided that there is no correlation between the *x's* and the *α's*. GLS requires weighting the observations of *y* and *x* by $\Sigma^{-(1/2)}$:

$$\Sigma^{-1/2} = \frac{1}{\sigma}\left[I\tau - \left(\frac{1-\sqrt{\theta}}{T}\iota\iota\right)\right] \tag{2}$$

where:

$$\theta = \frac{\sigma^2}{\sigma^2 + T\sigma_\alpha^2} \tag{3}$$

First one obtains an estimate *θ* by estimating the equation:

$$y_{it} - y_i = \beta(x_{it} - x_i) + (u_{it} - u_i) \tag{4}$$

Once the component variances have been estimated, one forms an estimator of the composite residual covariance and GLS transforms the dependent and regressor data (Baltagi, 2001; Davis, 2002).

4.3 Econometric Results

We observe (Tables 3 and 4,Appendix B) that estimated equation (1) meets the three required criteria of homoskedasticity, specification and normality and absence of serial correlation. Further, there is no unit root (Tables 1 and 2). Hence, the above model (1) is robust. At (95%) all coefficients are statistically significant. The constant term is positive, the coefficient of **[ts]** is positive, while that of **[crisis]** is negative. The positive impact of [**ts**] on [**ps**] indicates that the higher the [**ts**] is, then the higher the [**ps**] becomes. On the contrary, the negative impact of **[crisis]** on [**ps**] indicates that **[crisis]** reduces[**ps**]. It should be noted that the afore-mentioned two independent variables explain the 25% of the total variation of the dependent variable [**ps**]. This becomes clear by looking at the value of determination coefficient R^2 (table 5). In economics it means that political stability is explained by [**ts**] and **[crisis]** by 25%, which is too high to be neglected by the policy makers.

5   Conclusion

Our model supports the hypothesis that political stability under democratic regimes (our 18 cases of panel data analysis) goes hand in hand with stable and growing economy. Democracy and economy mutually reinforce each other. Democracy usually guarantees

better than absolutist regimes property rights, which again is one of the basic prerequisites for long-run economic prosperity and a nation's strength. Furthermore, we found that political stability in democratic regimes is positively related to the set of economic freedom indicators and negatively to financial crises, because greater economic freedom influences positively investment and economic growth, while financial crises lead to recession-depression, increasing the dissatisfaction of citizens. Thus our findings mostly verify earlier studies on the issue.

As it has already been mentioned, this trend dates back to antiquity and early modern history. For example, more democratic nations, with institutions that guaranteed property rights, individual freedom and enterprises, like the United Provinces and England (United Kingdom after 1707) had faster economic growth and prosperity than more absolutist countries which did not guarantee property rights, freedom etc, such as the Asian empires, China under Ming and Tsing (Manchurian) Dynasties, the Indian Mungal empire or the Ottoman, but also more absolutist European nations like the Spanish Empire and France (Kennedy, 1989, ch. 1; Rodger, 1997; Ormrod, 2003; Kyriazis and Metaxas, 2011; Kyriazis, 2012).

Strong economies enable democracies to undertake redistributive policies, as initiated by ancient Athens (Lyttkens, 1994; Ober, 2008, Kyriazis, 2009) and these policies (under the modern form of welfare programs like medicate, minimum pensions, etc.) create a community of interests, which again is the "glue of democracy", a phrase which belongs to the 4th century BCE Athenian orator Demades.[6] In times of crisis, welfare and redistributive policies decrease, as in our model's findings, and this again leads to citizens' dissatisfaction with democracy and thus to the rise of extremist parties.

In particular, for the EU today, there is a grave danger that the austerity policies, if considered by European citizens to be imposed by the EU, which shows a great democratic deficit[7], will lead to a "delegitimisation" of the EU, which, if not inverted, may cause severe strain (Galbraith, 2008; Lei, Tucker and Vesely, 2010; Georgiou, 2011; Karger, 2013)[8] as well as J. Stiglitz and P. Krugman.[9]We have indicated in the introduction the rise of *euroscepticism* and the anti-European parties. Government policies that do not have a bottom up legitimization in the eyes of their constituents erode the prestige of the policymakers who impose them. In such cases citizens feel more and more reluctant to "defend the system" according to Weingast (1997).

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[6] Today's China seems to be an exception, combining an undemocratic single party dictatorship political regime with high economic growth. Acemoglu and Robinson (2012) indicate that other modern absolutist regimes such as the Soviet Union showed substantial growth during the same periods, but ultimately failed. They believe that the same will happen to China if it does not democratise itself.

[7] The issues of community of interest and democratic deficit have been examined in detail by Economou and Kyriazis (2013) and Economou, Kyriazis and Metaxas (2014).

[8] For example, after the Greek economic crisis manifested itself in 2010, Greek policymakers undertook harsh economic measures such as raising excessively direct and indirect taxes, such as tax on land property which is still in force, the so called "ENFIA" tax. All these measures have caused social outrage because they were not introduced under a consent building strategy.

[9]http://www.project-syndicate.org/commentary/greece-eurozone-austerity-reform-by-joseph-e--stiglitz-2015-02, http://www.alternet.org/economy/paul-krugman-how-austerity-killed-europes-recovery-and-america-somehow-squeaked-through.

Thus, democratic leaders and governments have to be very careful when implementing economic policies. There is absolutely no excuse to invoke economic necessity in order to introduce undemocratic laws (as the former Greek governmental parties discovered in the 2015 elections). Some austerity measures were necessary in many countries, but the timing was probably wrong because it deepened the recession which had already started in 2009. At the EU level, economic measures imposed to face current problems, like public debt have to be counterbalanced with the implementation of long-term social welfare policies, in favour of the EU citizens as a whole. This means that the EU budget which is analogous to only 1% of the total GDP must be further increased so that further funds become available for the implementation of such policies, which will the further EU integration more feasible.

A too strong dose of austerity may be to the detriment of long-term aims, if it convinces many European citizens that the EU is responsible for their current woes.

Acknowledgements

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Appendix A

Table 1: Unit Root Test for [ps]

Panel unit root test: Summary

Series: **PS**

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

User specified lags at: 1

Newey-West bandwidth selection using Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3,92929	0,0000	18	198
Null: Unit root (assumes individual unit root process)				
PP - Fisher Chi-square				
	52,0957	0,0403	18	216

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution.All other tests assume asymptotic normality

Table 2: Unit Root Test for [ts]

Panel unit root test: Summary

Series: **TS**

Sample: 2000 2012

Exogenous variables: Individual effects, individual linear trends

User specified lags at: 1

Newey-West bandwidth selection using Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3,12603	0,0009	18	198
Null: Unit root (assumes individual unit root process)				
PP - Fisher Chi-square	51,3658	0,0466	18	216

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution.

   All other tests assume asymptotic normality.

Appendix B

Table 3: Results in Brief

Method	GLS Period SUR weights
c	11,267
p-value	*0,000*
ts	0,676
p-value	*0,000*
crisis	-0,336
p-value	*0,000*
Adjusted R^2	0,246
Durbin_Watson	1,960
Jarque - Bera	2,362

Note: For n = 234 (at 95%), d_U = 1,805. The results in detail are in table 5.

Table 4: Diagnostic Tests

TESTS	GLS Period SUR weights)	Critical values *(at 95%)*
Heteroskedasticity	1,624	3,037
Heteroskedasticity	1,605	3,037
Heteroskedasticity	2,797	3,841
Heteroskedasticity	2,242	7,815
$RESET_1$	0,313	3,841
$RESET_2$	0,243	5,991
$RESET_3$	0,183	7,815
Normality	2,362	5,991

Test 1: Regression of the squared residuals on X. That is, $u_t^2 = x_t'\gamma_1 + v_{t,1}$

Test 2: Regression of absolute residuals on X. That is, $|u_t| = x_t'\gamma_2 + v_{t,2}$ (a Glejser test)

Test 3: Regression of the squared residuals on $\hat{Y}$

Test 4: Regression of the log of squared residuals on X (a Harvey test)

Test 5: Regression of residuals on $\hat{Y}^2$

Test 6: Regression of residuals on $\hat{Y}^3$

Test 7: Regression of residuals on $\hat{Y}^4$

Test 8: Normality test (Jarque Bera)

Table 5: The Regression Results in detail

Dependent Variable: PS					
Method: Panel EGLS (Period SUR)					
Sample: 2000 2012					
Periods included: 13					
Cross-sections included: 18					
Total panel (balanced) observations: 234					
Linear estimation after one-step weighting matrix					
Period SUR (PCSE) standard errors & covariance (d.f. corrected)					
	Coefficient	Std. Error	t-Statistic	Prob.	
C	11,26703	0,700285	16,08919	0,0000	
TS	0,676301	0,078895	8,572177	0,0000	
CRISIS	-0,336124	0,060415	-5,563582	0,0000	
Weighted Statistics					
R-squared		0,252472	Mean dependent var	4,016779	
Adjusted R-squared		0,245999	S.D. dependent var	8,031440	
S.E. of regression		0,995974	Sum squared resid	229,1436	
F-statistic		39,00917	Durbin-Watson stat	1,960051	
Prob(F-statistic) 0,000000					