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Do Institutions and Culture Matter for Business Cycles?

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Abstract

We examine the relationship between institutions, culture and cyclical fluctuations for a sample of 45 European, Middle Eastern and North African countries. Better governance is associated with shorter and less severe contractions and milder expansions. Certain cultural traits, such as lack of acceptance of power distance and individualism, are also linked business cycle features. Business cycle synchronization is tightly related to similarities in the institutional environment. Mediterranean countries conform to these general tendencies.

Keywords: Business cycles, institutions, culture, Mediterranean countries, synchronization.

JEL Codes: C32, E32

> We can all conjure up images of a Mediterranean jeweled with islands, its coastlines indented by harbors, those schools for mariners, an invitation to travel and trade. In fact, the sea did not always in the past provide that 'natural link' between countries and peoples so often described. ... As a result, the Mediterranean world was long divided into autonomous areas, only precariously linked. ... These differences have often only been partly created by geography. ... It is the historical past, persistently creating differences and particularities, that has accentuated these peculiarities ... (p.23)
>
> F. Braudel, *The Mediterranean in the Ancient World*

1 Introduction

Understanding the nature of economic fluctuations and their regional interconnections has been gaining importance as the process of globalization continues unabated. By now, a number of papers have documented differences and similarities in the cyclical fluctuations of different regions of the world (see e.g. Rand and Tarp, 2002; Girardin, 2005; Aguiar and Gopinath 2007; Kose and Prasad, 2010; Benczur and Ratfai 2010; Garcia Cicco et. al. 2010; Male, 2011; Altug and Bildirici, 2012). Recent European Union economic and political initiatives toward Mediterranean countries, in particular, the Union for Mediterranean partnership (see www.eeas.europa.eu/euromed) are generating interest in the structure of cyclical fluctuations of the region and in the channels of transmission of cyclical shocks. Canova and Ciccarelli (2012) establish the existence of four regional factors in the cyclical fluctuations of the Mediterranean basin, roughly covering the major European countries, the Eastern, the Middle Eastern and the Southern Mediterranean countries. These factors display disparate cyclical dynamics and fail to display the increased cross-region linkages that characterize other areas of the world. Canova and Schlaepfer (2011) document the presence of important time variations in the cyclical fluctuations of the region but they cannot relate them with increased trade or financial interdependences.

One key issue the recent literature is trying to understand is the impact of alternative institutional arrangements on business cycle characteristics. The idea that institutions, defined as formal rules and informal constraints, affect the economic performance finds an eloquent enunciation in North (1990). Subsequently Knack and Keefer (1995), Hall and Jones (1999),Rodrik, et al. (2002), and Easterly and Levine (2003), showed that property rights and the rule of law are positively related to economic

performance. The impact of monetary and fiscal institutions and of monetary arrangements on longer terms outcomes have also been widely discussed in the literature (see, for example, Grilli et al., 1991; Alesina and Summers, 1993; or Cukierman et al., 1992, 2002, Rose and Engel, 2002, Allen and Gale 2007). The recent Euro area debt crisis, however, has drawn attention to the relationship between institutions and business cycles. Canova, et al. (2012) examined whether the Maastricht Treaty, the creation of the ECB, or the Euro changeover affected European business cycles, but found that the process of cyclical convergence precede these institutional changes and may well be consistent with a greater conformity of the shocks affecting the economies. Noting the durable nature of institutions, Altug, et al. (2012) associate *average* measures of business cycle characteristics and business cycle synchronization with a general set of institutional indicators for a large set of countries, and find that the relationship between the two is strong.

Another issue of interest in the literature is the relationship between cultural traits and economic performance. Weber (1904) was the first to point out that the two may be connected. More recently Hofstede (1980), Granato *et al.* (1996) and Tabellini (2011), among others, document that certain cultural factors affect on economic development, over and above those due to macroeconomic or institutional factors. However, whether cultural features are related to the structure and the transmission of business cycles is, to the best of our knowledge, still a completely unexplored area.

This paper examines the role of institutions and culture for cyclical fluctuations of a set of developed, developing and emerging market economies. We initially perform the analysis for a sample which includes up to 45 European, Middle Eastern and North African countries and then zoom in on the Mediterranean region. Our interest in institutional and cultural factors as potential determinants of business cycles fluctuations departs from much of the recent literature, which has typically focused on trade and financial integration (see, for example, Imbs, 2010). However, for many of the new members states of the EU as well as non-EU countries in the Mediterranean, the institutional and cultural environment forms the backdrop in which alternative policies are implemented. In addition, at least in the Mediterranean, differences in trade and financial interdependences do not relate well with differences in cyclical features (see Canova and Schlaepfer, 2011).

We begin by documenting the business cycle characteristics of different groups of countries in our sample – the EU-15 countries comprising the original members of the EU, the EU-12 comprising the new Eastern European members, non-EU countries, the Mediterranean countries and non-EU

Mediterranean countries - using data on real GDP and, in its absence, on industrial production. While previous studies have highlighted the presence of significant heterogeneity even within these groups (see, for example, Altug and Bildirici, 2012), we start from these broad classifications as they may reflect some common underlying factors or attributes. We then describe the alternative institutional, cultural and macroeconomic indicators used in our study and ask whether business cycle characteristics are associated with institutional and cultural indicators using three alternative methodologies (rank correlation analysis, clustering techniques and regression methods).

The results we obtain are quite robust. Better governance and better civil liberties are associated with shorter and less severe contractions, and milder expansions, while similarities in cultural traits, such as lack of acceptance of power distance and the presence of individualism in a society, are associated with similar business cycle features. Furthermore, business cycle synchronization is strongly related to similarities in the institutional environment. These conclusions seems to be true, in particular, for the Mediterranean region and hold even conditioning on a set of important macroeconomic indicators. The finding that the institutional and cultural environment relates to the persistence and the volatility of business fluctuations and to their synchronization across countries and regions is novel and may help to shift the investigation focus of the existing business cycle literature.

The rest of the paper is organized as follows. The next section describes the techniques used to extract business cycle features and discusses our findings. Section 3 describes the institutional and cultural measures and their properties. Section 4 present the results. Section 5 concludes.

2 Measuring Business Cycles

To extract the features of cyclical fluctuations in different countries, we compute turning points for "classical" cycles and measure cyclical characteristics using the resulting turning point classification. It is well known that classical cycles do not control for trends, as they are computed using the level of the series. Nevertheless, the turning point dates the methodology delivers in countries like the US or the EU reproduce quite well NBER and CEPR classifications, which are obtained using judgmental calls. To date peaks and troughs, we use the quarterly version of the Bry-Boschan algorithm recently suggested by Harding and Pagan (2005, 2006). In this algorithm, a business cycle peak is identified if $\{y_{t-1} - y_{t-2} > 0, y_t - y_{t-1} > 0, y_{t+1} - y_t < 0, y_{t+2} - y_{t+1} < 0\}$ where $y_t = \ln(Y_t)$ and Y_t is the

series of interest, measured at the quarterly interval. Likewise, a trough is identified at time t if $\{y_{t-1} - y_{t-2} < 0, y_t - y_{t-1} < 0, y_{t+1} - y_t > 0, y_{t+2} - y_{t+1} > 0\}$. A *complete* cycle is defined as alternating peaks and troughs with a minimum duration of five quarters.

To date turning points we use real GDP or, in its absence, industrial production. We chose a single indicator, rather than multiple indicators such as real output, unemployment, industrial production, real income and real sales because, as Altug, et al. (2011) have shown, measures of real output and unemployment are cyclically "de-coupled" in many emerging or developing economies and, at least over the last decade, tend to display different dynamics in many advanced economies as well. In addition, for many of the less developed countries, alternative measures of national wealth (such as real income or sales) are unavailable. Thus, while more reliable business cycle signals can obtained using multiple indicators, lack of data and strong asynchronicity of important variables, lead us to choose a single indicator to date turning points.

Individual business cycle characteristics are summarized via measures of *duration* (persistence), *amplitude* (variability) of the fluctuations, and *cumulated output loss* (the cost of fluctuations) in each country. Co-movements are measured with the pairwise synchronization of turning points - the *concordance index* (cross correlation) - and their heterogeneities with a *diffusion index.* Let D_i denote the duration of a business cycle phase, where i stands for recessions or expansions, and let A_i denote the amplitude. If consecutive turning points fall on the dates t and $t+d$, then $D_i = d$, $A_i = y_{t+d} - y_t = \Delta_d y_t$ and the cumulated loss (gain) during each phase is $C_i = 0.5\ A_i + \sum_{s=1}^{d-1} \Delta_s y_{t+s}$. The pairwise *concordance index* measures the fraction of times two countries are jointly in phase over the business cycle (see Harding and Pagan, 2006) and it is calculated as follows. Let the random variable S_{it} be defined as

$$S_{it} = \begin{cases} 0 & \text{if country } i \text{ is in a recessionary phase} \\ 1 & \text{otherwise.} \end{cases} \tag{2.1}$$

Thus, S_{it} captures business cycle phases. Then the index is given by

$$I_{ij} = \frac{1}{T}\left\{\sum_{t=1}^{T} S_{it}S_{jt} + \sum_{t=1}^{T}(1 - S_{it})(1 - S_{jt})\right\}, \tag{2.2}$$

where $T = \min(T_i, T_j)$. Clearly, the concordance index has a maximum value of one when $S_{it} = S_{jt}$ and minimum value of zero when $S_{it} = (1 - S_{jt})$.

The diffusion index shows the fraction of countries sharing the same phase at any given time and

it is computed as (see Chang and Hwang, 2011):

$$D_t = \sum_{i=1}^{N_t} w_{it} S_{it},$$

where w_{it} are the weights assigned to country i, N_t denotes the number of countries for which we have business cycles dates at any t, and $S_{it} = 1$ if country i is in a recession and zero otherwise. For simplicity, we set $w_{it} = 1/N_{it}$ for all t. Thus, homogeneity of cyclical turning points would be signaled by values of D_t close to one at some dates and values close to zero at the rest of the dates. On the other hand, cyclical heterogeneity would show up when the index takes values close to 0.5 at many dates in the sample

Since we have a large set of countries, we compare cyclical statistics grouping them as follows:

- EU-15: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and United Kingdom
- EU-12: Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovenia, Slovakia, Malta, and Romania.
- Non-EU countries: Albania, Algeria, Bosnia, Croatia, Egypt, Iceland, Israel, Jordan, Lebanon, Macedonia, Montenegro, Morocco, Norway, Serbia, Switzerland, Syria, Tunisia, Turkey
- Mediterranean countries: Albania, Algeria, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Jordan, Lebanon, Macedonia, Malta, Morocco, Portugal, Serbia, Syria, Spain, Tunisia, Turkey
- Non-EU Mediterranean: Albania, Algeria, Croatia, Cyprus, Egypt, Israel, Jordan, Lebanon, Macedonia, Malta, Morocco, Serbia, Syria, Tunisia, Turkey

This classification seems natural as it tries to distinguish the original EU members, the new EU members coming from Eastern Europe and, in the Mediterranean, it singles out EU and non-EU countries. While there are other possible classifications, for example based on the level of income, the development or the trade openness, they have been found to be ineffective to group business cycle fluctuations for a subset of the countries we consider (see Canova and Ciccarelli, 2012). Since we study business cycle features of developed, emerging and developing economies and further separate out the Mediterranean region as a case study, our results complement those of Male (2011), who considers a large set of emerging and developing economies but only the US, the UK and Japan among the

developed economies, and of Altug, et al. (2012), who include only a few countries from the eastern or southern Mediterranean basin in their study of business cycles of transition, emerging and developed countries.

The sources of the data, the length of the sample for each country, and details on the variables used to construct cyclical turning points are described in the data appendix.

2.1 Some business cycle facts

Table 1 displays the average business cycle characteristics for the countries in which at least one complete cycle is detected, and a measure of dispersion (standard deviation) within each group [1].

The results in table 1 shows that the duration of contractions does not greatly differ across the first four groups, but non-EU Mediterranean countries have longer contractions. There are, however, important differences in the amplitude of contractions. For example, the amplitude of this phase in the original EU-15 countries, it is about half of the one for the remaining groups. These findings are consistent with those of Krolzig and Toro (2005) and Altug and Bildirici (2012), who show that the "core" EU countries (Austria, Belgium, Denmark, France, Germany, and the Netherlands) have suffered relatively mild recessions as compared to other countries in the region. The duration of expansions is also largest for the original EU-15 countries, with the remaining countries exhibiting expansions that last, on average, 6 to 10 quarters less. By contrast, the amplitude of expansions for the EU-15 countries is the smallest: here the EU-12 and non-EU Mediterranean countries display the greatest percentage real output increases in this phase.

The *cumulated* output loss/gain measure suggests that the EU-12 and the non-EU Mediterranean countries suffer most during contractions. However, it is the EU-12 and the EU-15 groups that experience greatest output gains during expansions, followed by the non-EU Mediterranean countries. The causes, however, are different: for EU-12 group, it is the large amplitude of expansions that leads to large cumulative output gains; for the EU-15 countries, large output gains obtain because of the long duration of expansions.

The average concordance index within and across groups, reported on the bottom of Table 1, also has interesting features. First, the concordance is highest for the older members of the EU, followed

[1] We were unable to identify a complete business cycle for Bosnia, Egypt, Montenegro, and Syria among the non-EU countries and Ireland, Latvia, Lithuania, Poland, and Slovenia among the EU countries.

Business Cycle Statistics							
	Contraction			**Expansion**			
	duration†	amplitude‡	cumulated‡	duration†	amplitude‡	cumulated‡	
EU-15	3.61	2.27	7.83	28.26	22.20	494.85	
	(0.99)	(0.14)	(6.80)	(12.27)	(0.81)	(2.65)	
EU-12	3.86	5.65	21.93	22.65	31.84	542.72	
	(1.51)	(0.52)	(2.13)	(10.90)	(1.54)	(38.82)	
Non-EU	3.92	6.42	19.59	18.63	27.34	418.69	
	(1.55)	(0.42)	(2.31)	(10.73)	(1.64)	(43.30)	
Mediterranean	3.96	6.00	18.01	19.43	23.09	389.87	
	(1.27)	(0.39)	(1.88)	(11.59)	(1.55)	(40.31)	
Non-EU Mediterranean	4.31	7.73	24.10	18.98	30.06	463.55	
	(1.50)	(0.38)	(2.21)	(12.02)	(1.72)	(47.75)	
Concordance							
	EU15	EU12	Non-EU	Medi.	Non Medi.	Non-EU Medi.	Others
EU15	0.8545	0.8001	0.7597				
	(0.0548)	(0.0833)	(0.0986)				
EU12		0.7306	0.7261				
		(0.0749)	(0.0998)				
Non-EU			0.6961				
			(0.1088)				
Mediterranean				0.7148	0.7638		
				(0.1126)	(0.1008)		
Non-Mediterranean					0.8148		
					(0.0744)		
Non-EU Mediterranean						0.6792	0.7334
						((0.1161)	(0.1035)
							0.8047
Others							(0.0796)

Notes: † in quarters; ‡ in percent. **EU-15**: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, Netherlands, Portugal,Spain, Sweden, UK; **EU-12**: Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Slovakia, Malta, and Romania; **Non-EU**: Albania, Algeria, Croatia, Iceland, Israel, Jordan, Lebanon, Macedonia, Montenegro, Morocco, Norway, Serbia, Switzerland, Tunisia, Turkey; **Mediterranean**: Albania, Algeria, Croatia, Cyprus, France, Greece, Israel, Italy, Jordan, Lebanon, Macedonia, Malta, Morocco, Portugal, Serbia, Spain, Tunisia, Turkey; **Non-EU Mediterranean**: Albania, Algeria, Croatia, Israel, Jordan, Lebanon, Macedonia, Morocco, Serbia, Tunisia, Turkey

Table 1: Business Cycle Statistics

by the new EU members. Interestingly, the concordances between the EU-15 and EU-12 countries is also high. Second, the concordance within non-EU countries is low while the concordance between non-EU and EU countries is higher. Similarly, the concordance within the Mediterranean is low and the synchronization between Mediterranean and non-Mediterranean countries is higher. Thus, there are important business cycle heterogeneities within the non-EU and the Mediterranean: countries in these groups have cycles which are more synchronized with countries outside of the group. Third, while Mediterranean EU countries have cycles which are well synchronized with the cycles of other EU countries, non-EU Mediterranean countries have the lowest concordance, both within themselves and with the others.

The dispersion measures also indicate that within group heterogeneities are important. Contractions have roughly the same duration and amplitude in the EU, while this is not the case for non-EU and non-EU Mediterranean countries. Furthermore, while in the EU-15 business cycle turning points are quite in phase, this is much less the case in the non-EU or the Mediterranean groups. Once again, non-EU Mediterranean group is the most heterogeneous of all. Thus, the Mediterranean appears to be an area where the features of fluctuations are diverse, heterogeneities are large, and different groups of countries display disparate business cycles patterns.

Table 2, which presents the contraction phases of the countries in the Mediterranean group, confirm the large heterogeneities present in the region. Even among EU member states who are also part of the euro zone, significant differences are present. For example, France experiences two major recessions at two crises times: the collapse of the European Exchange Rate Mechanism in 1992 and the global financial crisis in 2008. Spain displays five complete recessions, one more than France, while Greece and Italy, two of leading actors in the current debt crisis, feature nine and ten recessions, respectively. Interestingly, the majority of the recessions in Greece occur prior to 1993 while in Italy there is an equal number of recessions before and after 1993.

The turning points for Algeria, Cyprus, Lebanon and Tunisia are obtained using industrial production data, which are known to be less persistent than GDP, but this does not seem to cause the algorithm to give excessive "false alarms". Many non-EU Mediterranean countries display up to six complete cycles since the 1990's and the duration of recessions is, occasionally, long - see e.g. Algeria who experiences a four-year recession between 1993Q4-1997Q4. Balkan countries also feature lengthy recessions in the transition process to new economic and political regimes. Small open economies, such

Albania	1990Q1-1992Q1 1996Q2-1997Q1 2010Q1-2010Q4	Jordan	1994Q3-1995Q1 1997Q2-1997Q3	Tunisia	1992Q1-1993Q1 2000Q3-2002Q1 2003Q2-2004Q1 2007Q2-2008Q1
Algeria	1992Q1-1992Q4 1993Q4-1997Q4 2000Q4-2001Q2 2004Q2-2004Q3 2006Q4-2007Q2 2006Q4-2007Q2	Lebanon	1992Q1-1993Q3 1997Q4-1998Q2 1999Q2-2000Q1 2002Q3-2003Q1 2004Q1-2004Q2 2005Q3-2005Q4	Turkey	1988Q1-1989Q2 1994Q1-1994Q2 1998Q2-1999Q1 2001Q1-2001Q2 2003Q1-2003Q2 2008Q1-2009Q2
Croatia	1998Q1-1999Q1 2008Q3-2008Q4	Macedonia	1990Q1-1995Q2 2000Q2-2001Q3 2008Q4-2009Q3		
Cyprus	1984Q3-1985Q3 1990Q3-1991Q1 1992Q4-1993Q2 1996Q1-1996Q3 2000Q2-2000Q4 2004Q2-2004Q3 2005Q4-2005Q1 2008Q3-2010Q1	Malta	1998Q1-1998Q4 2002Q2-2003Q2 2004Q1-2004Q3 2008Q3-2009Q1		
France	1974Q4-1975Q2 1980Q2-1980Q4 1992Q4-1993Q1 2008Q2-2009Q2	Morocco	1989Q1-1989Q4 1991Q1-1993Q2 1994Q1-1994Q2 1996Q1-1996Q2		
Greece	1973Q4-1974Q3 1977Q1-1977Q2 1980Q3-1981Q1 1981Q4-1983Q2 1984Q4-1985Q1 1986Q1-1987Q1 1990Q2-1990Q3 1992Q2-1993Q4 2008Q4-2009Q1	Portugal	2002Q3-2003Q2 2008Q1-2008Q4		
Israel	1982Q2-1982Q3 1988Q2-1989Q1 1992Q3-1993Q2 2001Q1-2001Q4	Serbia	1997Q4-1999Q2 2008Q2-2009Q2		
Italy	1964Q2-1964Q4 1974Q4-1975Q2 1977Q2-1977Q3 1982Q1-1982Q4 1992Q2-1993Q3 1996Q2-1996Q4 2001Q2-2001Q4 2003Q1-2003Q2 2004Q4-2005Q1 2008Q2-2009Q2	Spain	1974Q4-1975Q1 1978Q2-1978Q4 1980Q4-1981Q1 1991Q4-1993Q2 2008Q3-2009Q2		

Table 2: Contraction Phases: Mediterranean Countries

as Israel and Turkey, that are more integrated into the global economy tend to suffer the effects of imported shocks. For example, Turkey's recession in 1998 is related to the contagion effects of the Russian debt default, while Israel's recession in 2001 is partly due to the bursting of the dot.com bubble and the consequent worldwide slowdown of economic activity. In general, the large heterogeneities of turning point dates in the region is consistent with the idea that the factors inducing cyclical fluctuations in Mediterranean are highly idiosyncratic.

The diffusion index for four different groups of countries – the full sample, the Mediterranean countries, the non-EU countries, and the non-EU Mediterranean countries – is in Figure 1. For the full sample of countries, there are a number of recession spikes but the largest correspond to the oil shock recessions of the 1970's and 1980's and to the ERM crisis of 1990. The 2008-2009 recession is clearly the most global of all, with more than 80% of the countries being in that phase during this period. For the restricted sample of Mediterranean countries, the picture is less clear; see the upper right graph in Figure 1. There are still three major spikes with generalized recessions in the 1970's, at the beginning of the 1990's and in 2008 but there is also a lot of noise and, e.g., in the middle of the sample, about one-third of the countries were in a recession. Furthermore, it is clear that the dynamics of recessions in the full sample and in the Mediterranean subsample differ. As shown in Canova and Ciccarelli (2012), re-grouping business cycle dynamics using geographical proximity, level of wealth, development indicators, or whether they adopt the euro or not, does not reduce the heterogeneities present in this group.

The incidence of recessions for non-EU and non-EU Mediterranean countries, shown in the lower panels of Figure 1, is also quite heterogeneous and the presence of synchronized recessions is much harder to detect. For the non-EU countries, which includes some developed nations such as Iceland, Norway and Switzerland, there is evidence of generalized recessions in the early 1980's and the early 1990's. For the rest of the dates, recessionary episodes tend to be common only to smaller groups of countries. A similar story emerges when we consider the non-EU Mediterranean countries. Interestingly, this groups is only mildly affected by the 2008-2009 global crisis, indicating the lower level of integration of this region with the world economy.

In sum, the EU-15 countries exhibit more persistent and less volatile business cycles; their expansions are the longest and output fluctuations are small, both during contractions and expansions. The remaining groups of countries have more volatile business cycles, and the non-EU Mediterranean

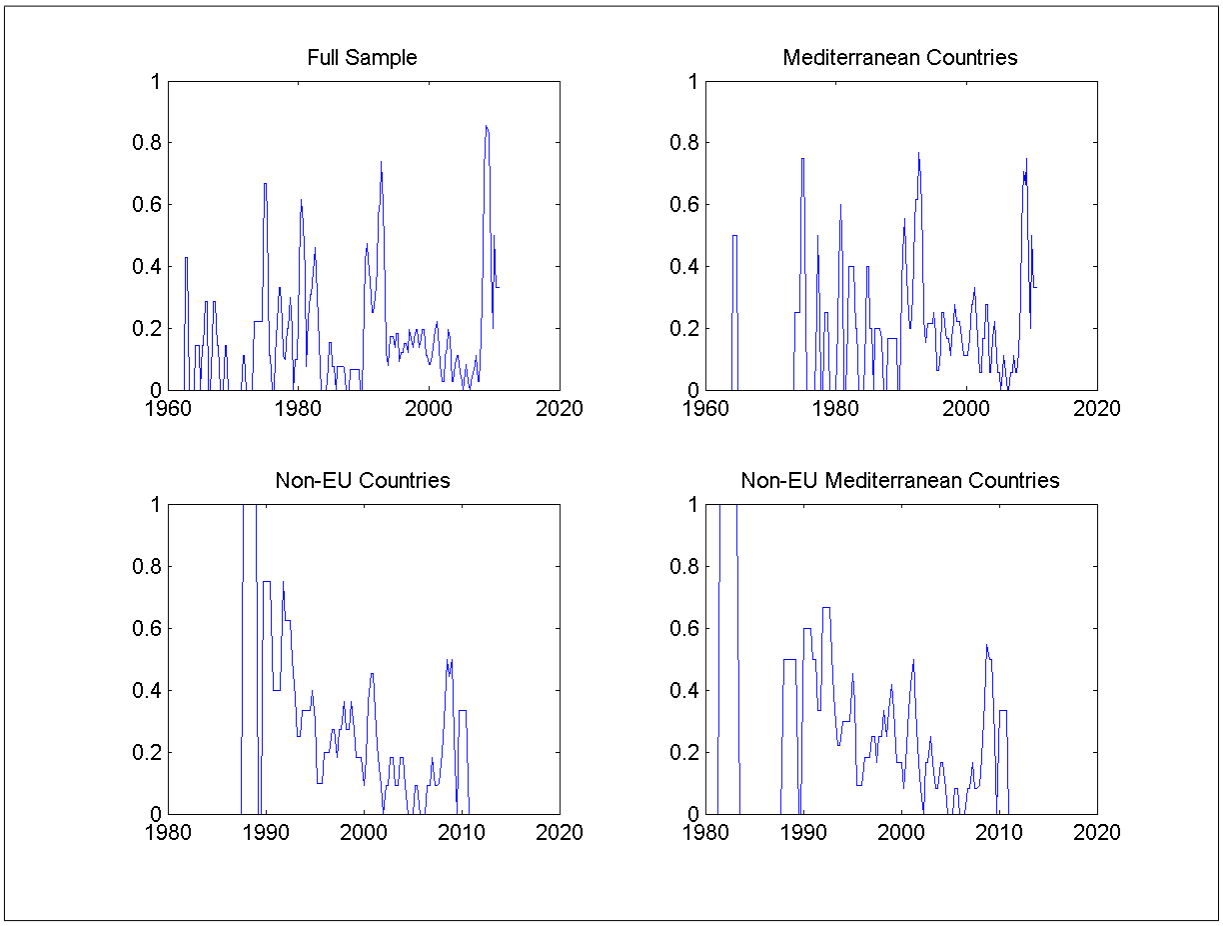

Figure 1: Diffusion Index in Recessions

countries display the shortest persistence of expansions and the largest amplitude of contractions. Furthermore, the countries belonging to the EU-12 and the non-EU Mediterranean groups tend to display business cycle episodes with significant contractions followed by large increases in output, suggesting a boom-bust scenario relative to the more stable economies in the EU-15. The concordance of turning points tends to be high among EU countries, while within the Mediterranean or within the non-EU Mediterranean group differences are large.

3 Institutional, Cultural and Macroeconomic Indicators

In this section we describe the governance, cultural and macroeconomic indicators we use in the analysis. While the role of institutional and cultural factors has been extensively studied to explain long-run growth trajectories, such factors may also influence the extent countries can insulate against political risk and regional and global shocks. Countries that have weak rule of law or accountability will also fail to propose and implement policies that benefit large segments of the population. Lack of political stability may prevent even the best designed policies from having their intended effects. The cultural environment may determine the types of activities the population undertakes, whether these will be long-term, productive activities, or whether they will be short-term and lacking in innovation.

We measure institutional and cultural attributes using a set of indicators that have been developed on a cross-country basis. As institutional indicators we consider (i) the average of the Worldwide Governance indices provided by the World Bank (Gov) (see Kaufman, Kraay and Mastruzzi, 2009), which measures different dimensions of governance grouped as voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption; (ii) the Civil Liberties Index prepared by the Freedom House (FH); and (iii) an index of central bank independence (CBI). The cultural indicators we have are those compiled by Geert Hofstede (http://geert-hofstede.com) defined as "power distance (Pdi)", "individualism" (Ind), "masculinity/femininity" (Mas/Fem), and "uncertainty avoidance" (Uai). Power distance measures "the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally". The individualism indicator measures the degree of interdependences a society maintain among its members. Masculinity/femininity are defined such that a masculine motivational attitude represents wanting to be the best and a feminine attitude denotes liking what one is doing. The uncertainty avoidance indicator, on the other hand, measures "the extent

to which members of a culture feel threatened by ambiguous or unknown situations and have created beliefs and institutions that try to avoid these ". Further information on these indicators and how they are constructed is in the data appendix.

To control for factors that may affect business cycles but not of direct interest in the investigation we use a number of macroeconomic variables. These are: (i) openness (*open*), measured as the sum of exports and imports as a percentage of GDP; (ii) inflation the rate of depreciation of the real price of money (D), defined as the inflation rate/(1+inflation rate), as in Cukierman *et al.* (1992)[2]; (iii) credit extended to the private sector as a ratio to GDP (cr/Y); (iv) current account balance to GDP (ca/Y); (v) FDI to GDP (fdi/Y); and (vi) the log of real GDP per capita. We also control for the association with the EU (with a EU dummy (EU)), the level of development (with a G-7 dummy ($G7$)), and for the type of monetary regime adopted (inflation targeting, IT, currency boards CB, or currency union regimes, CU) since *a priori* these characteristics could matter for how business cycles develop.

4 Are Business Cycles, Institutions and Culture Related?

We have shown that business cycle dynamics differ across groups of countries and that within groups, for example, in the Mediterranean, national idiosyncrasies are important. We have also argued that standard development, wealth or monetary indicators cannot explain these differences. As shown by Canova and Schlaepfer (2011), differences within the Mediterranean cannot be accounted for also by trade or financial openness. Thus, a more complex set of factors may be driving business cycle activity and differences between the EU-15 and the Mediterranean region. Could institutions and culture be some of these factors? This section suggests that they might.

4.1 Some preliminary evidence

Figure 2 presents unconditional scatter plots of the average business cycle characteristics with the CBI, Gov, FH indicators and with the principal components of our macroeconomic indicators, $MPC1$. We observe that business cycle characteristics and some institutional indicators are related. For example, countries that score high in terms of the overall governance indicator Gov tend to have longer and milder expansions and contractions that are less severe. The relationship between business cycle features and the FH index is less clear due to the larger dispersion but, even in this case, countries that score

[2]This transformation is used to eliminate the problems that may arise from the large range of inflation values present in the data set

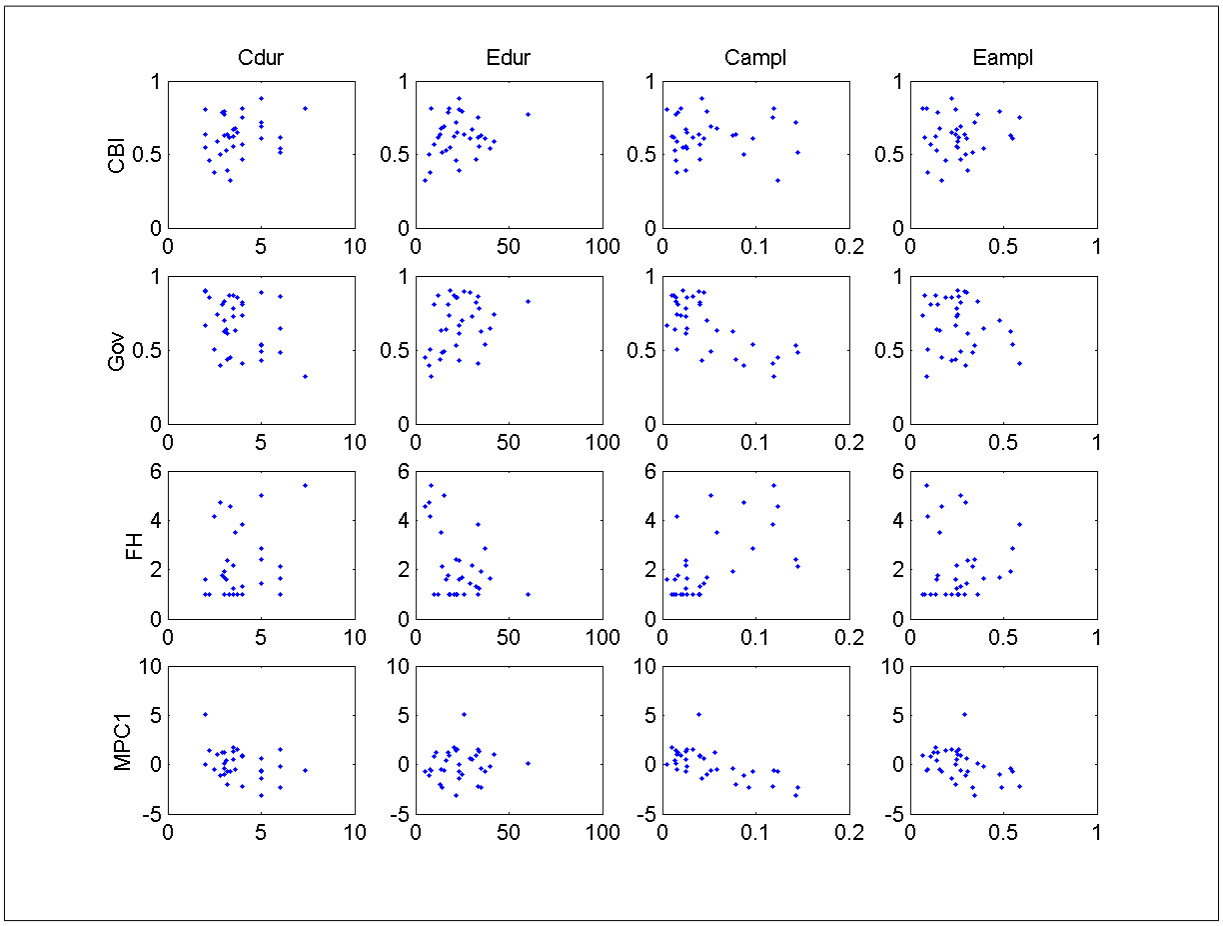

Figure 2: Institutional Indicators and Cyclical Statistics

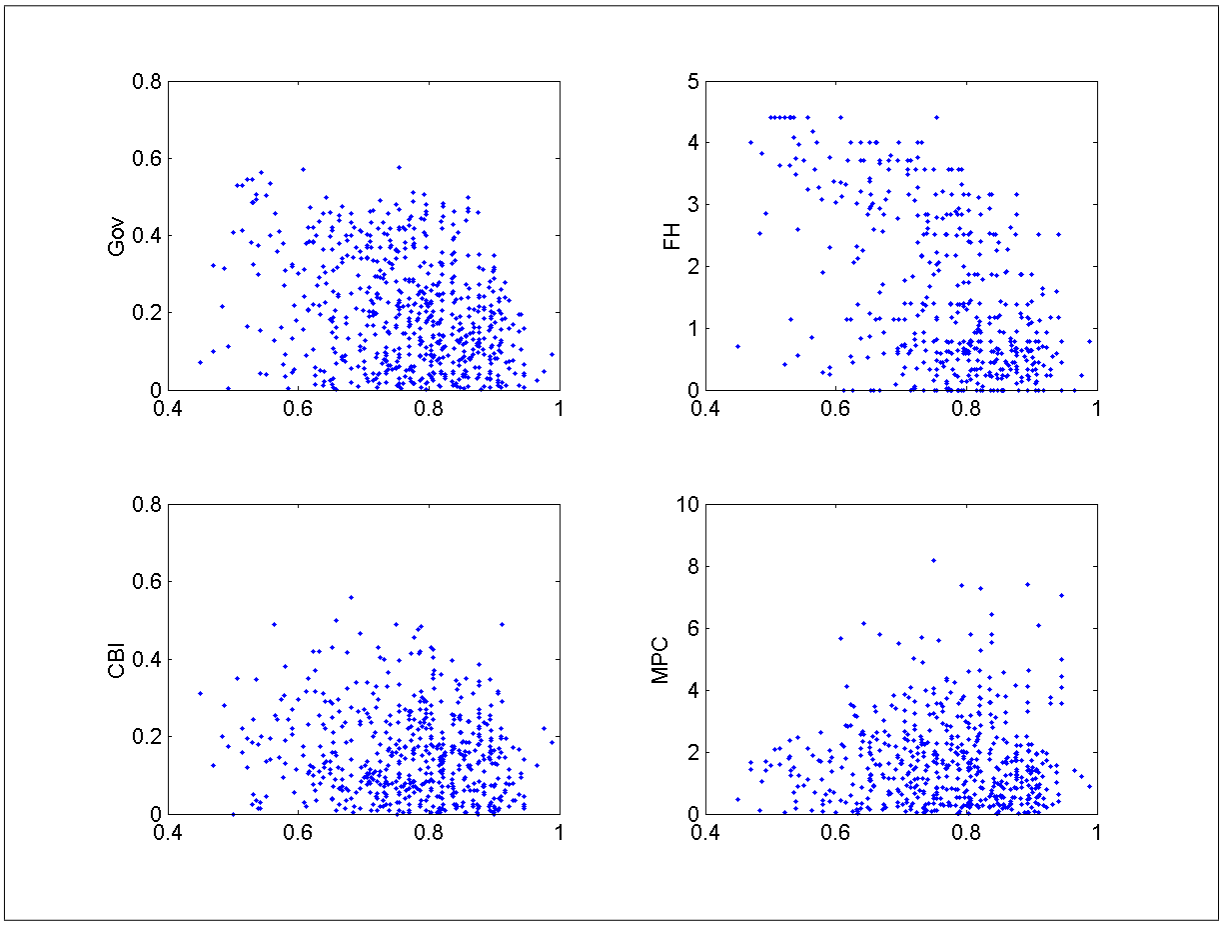

Figure 3: Institutional and Macroeconomic Indicators and Business Cycle Synchronization

better in terms of this indicator (lower values of FH indicate higher freedom or a higher quality of governance) tend to have longer expansions and lower output loss during contractions. There is also relatively tight relationship between the first principal component of the macroeconomic indicators and the business cycle statistics and, for example, better macroeconomic conditions are associated with smaller amplitudes, in both expansions and contractions. Thus, countries with more favorable macroeconomic characteristics are less likely to experience boom-bust scenarios.

Figure 3 presents unconditional scatter plots of the bilateral concordance measures with the differences in he institutional and macroeconomic indicators. Clearly, countries that are more similar in their institutional indicators (either measured by the World Bank governance indicator *Gov* or the Freedom House indicator FH) tend to have more synchronized business cycles. By contrast, proximity in terms of the macroeconomic indicators, is much less related to business synchronization. Indeed, the lower

Whole set of countries							
	Institutional Indicators			Cultural Indicators			
	CBI	Gov	FH	Pdi	Ind	Mas	Uai
C-dur	0.0279	-0.5336*	0.5296*	0.2176	-0.3950*	-0.1391	0.0956
E-dur	-0.0560	-0.1403	0.0426	0.1488	-0.0246	-0.1161	-0.0372
C-ampl	-0.0209	-0.7372*	0.7412*	0.4422*	-0.5695*	0.0369	0.1071
E-ampl	-0.0811	-0.5012*	0.4488*	0.3444*	-0.3789*	-0.0684	-0.1068
Concordance	0.1616*	0.3230*	0.4176*	0.1122*	0.1223*	-0.190	-0.002
Mediterranean group							
	Institutional Indicators			Cultural Indicators			
	CBI	Gov	FH	Pdi	Ind	Mas	Uai
C-dur	0.1683	-0.7069*	0.6756*	0.4356*	-0.4576*	0.1058	0.0022
E-dur	0.0733	-0.3127	0.1976	0.3410	-0.2202	-0.2315	0.2002
C-ampl	0.0537	-0.7936*	0.7129*	0.6029*	-0.5281*	0.3087	0.3036
E-ampl	-0.0155	-0.6140*	0.5163*	0.5523*	-0.3102	-0.0463	-0.1936
Concordance	0.1687*	0.2816*	0.2343*	0.1989*	0.2617*	0.3270*	0.4130*

Notes: C-dur and E-dur stand for duration of contractions and expansions; C-ampl and and E-ampl for amplitude of contractions and expansions. CBI is the index of central bank independence; Gov is the governance index and FH the freedom house index. Pdi stands for power distance index, Ind for the index of individualism, Mas for the index of masculinity and UAI for the uncertainty avoidance index. A * indicates correlations which are significant at the 10 percent level.

Table 3: Spearman Rank Correlations

right panel of Figure 3 suggests that the same level of business cycle synchronization is associated with a wide range of macroeconomic performance.

The fact that differences in macroeconomic variables do not correlate well with the concordance index, while differences in institutional indicators do, is interesting. If the institutional environment affects both the severity of recessions and the cyclical synchronization with other countries, as the recent experience of Greece or Italy in the European debt crisis suggests, then a sole focus on the macroeconomic factors as drivers of business cycles may be much less warranted than previously assumed.

Table 3 presents the Spearman rank correlations between the business cycle characteristics and alternative indicators of institutions and culture. The top panel refers to the full set of countries we have available while the bottom panel is concerned with the Mediterranean group. In constructing these correlations, we have first conditioned out macroeconomic influences. That is, we have regressed amplitudes, durations and concordance measures on the first estimated principal component of macroeconomic factors and then correlated the residuals with the indicators of institutions and culture. We do so to maintain comparability with the regression analysis presented below, where conditioning factors

are used. Using unconditional rank correlations gives similar signs and similar significances.

The CBI index is uncorrelated with the duration and the amplitude of both recessions and expansions. Thus, as in Canova, et al. (2012), monetary institutions do not necessarily affect the persistence and the volatility of business cycles. Countries which have good governance (or a low Freedom House score), on the other hand, tend to have contractions which significantly shorter durations and amplitudes that are significantly smaller, in both contractions and expansions. As we have seen in Table 1, the EU-15 are the countries with the shortest contractions and the smallest amplitudes during both contractions and expansions. Since these countries are also those who are on the top of the ranking as far as these two indices are concerned, the results are consistent. As expected from Figure 3, differences in institutional factors are strongly related to the concordance of business cycle fluctuations. Thus, having similar central bank independence, a similar governance indicator and a similar Freedom House score make the pairwise concordances of business cycle turning points high.

Cultural indicators also correlate, although to a smaller extent, with business cycle features. Larger power distance, i.e., the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally, is associated with increases in the amplitude of contractions and expansions while higher levels of individualism are associated with smaller amplitudes and smaller duration of the contractions. To rephrase this conclusion, acceptance of inequality in a society is associated with higher business cycle volatility, while greater individualism in a society tends to be associated with significantly smaller volatility and reduced contraction phases. Differences in power distance and individualism are also positively and significantly related to the concordance of business cycle fluctuations. The other two cultural indicators (masculinity/femininity and uncertainty avoidance), instead, are not significantly correlated with business cycle features.

The countries belonging to the Mediterranean group display a similar pattern. The level of central bank independence does not seem to matter for amplitude and durations; good governance is associated with contractions that are shorter and with both contractions and expansions being milder; differences in institutional characteristics are strongly associated with business cycle synchronization. On the other hand, smaller power distance and greater individualism are associated with shorter and milder contractions and less vigorous expansions, while smaller differences in the cultural indicators are associated with larger pairwise concordance measures.

Perhaps, one should not be particularly surprised to find that the persistence and the amplitude

of business cycles fluctuations depend on how well run a the country is, and which cultural values are ingrained in the society. What is more striking is the strong association between synchronicity of turning points dates and institutional and cultural characteristics. Both of these facts have been largely overlooked in studies which try to explain business cycles similarities and differences. Thus, institutions and norms, more than trade or financial interdependencies, could be crucial to understand why cyclical fluctuations are similar or not.

4.2 Clustering

An alternative way to examine whether institutions and culture are related to the business cycle characteristics is to cluster business cycles features and ask if the groups that are generated using, say, high versus low institutional or cultural features differ or not. To cluster countries into groups we use two separate procedures. First, we construct the first principal component of institutions and culture, find the countries which are above or below the mean predicted value based on the principal component, group countries according to these indicators, and then test whether durations, amplitudes and concordances are different. Second, we use a clustering algorithm to endogenously group countries according to institutional and cultural features and test whether durations, amplitudes and concordances are different. The results are similar and are broadly independent of whether we first condition of macro factors or not. Thus, we present only conditional results based on the clustering algorithm, see Table 4. The top panel reports results obtained using the whole set of countries, the bottom panel results for the Mediterranean subset.

To test the difference between groups we use the U-Mann (rank sum) test. This is a non-parametric two-sided test which examines whether the medians of the two samples have the same value. Thus, small or large p-values indicate significant evidence against the null. The results broadly confirm the conclusions of Table 3. First, institutions seem to matter, both for the whole set of countries and for the restricted Mediterranean group. In particular, the amplitude of contractions and the pairwise concordance significantly differ in the two groups. The duration of expansions differs when the full sample is used, but not significantly so for the restricted set of Mediterranean countries. Thus, having better institutions tends to make contractions shorter, expansions more long-lasting and cyclical phases more synchronized.

The results obtained clustering business cycles using cultural differences are less clear cut. For the

	Whole set of countries				
	Using Institutional Indicators				
	C-dur	E-dur	C-ampl	E-ampl	Concordance
P-values	0.4287	0.0062*	0.0022*	0.4156	0.0000*
	Using Cultural Indicators				
	C-dur	E-dur	C-ampl	E-ampl	Concordance
P-values	0.5145	0.5813	0.6960	0.1810	0.1014*
	Mediterranean countries				
	Using Institutional Indicators				
	C-dur	E-dur	C-ampl	E-ampl	Concordance
P-values	0.3703	0.1457	0.0205*	0.6965	0.0270*
	Using Cultural Indicators				
	Cdur	E-dur	C-ampl	E-ampl	Concordance
P-values	0.7398	0.7242	0.3283	0.1509	0.0216*

Notes: C-dur and E-dur stand for duration of contractions and expansions; C-ampl and and E-ampl for amplitude of contractions and expansions. Groups are endogenously constructed using a cluster algorithm that looks for similarities of cyclical fluctuations. **Institutional indicators:** (i) with the full sample, group 1 includes Albania, Algeria, Jordan, Lebanon, Macedonia, Morocco, Serbia, Tunisia, Turkey, Cyprus and Greece and group 2 the rest; (ii) with the Mediterranean sample, group 1 includes Albania, Algeria, Jordan, Lebanon, Macedonia, Morocco, Serbia, Tunisia, Turkey, and Greece and group 2 the rest. **Cultural indicators:** (i) with the full sample, group 1 includes Albania, Jordan, Lebanon, Macedonia, Morocco, Serbia, Tunisia, Turkey, Austria, Czech Republic, Estonia, Finland, Hungary, Luxembourg, Malta, Netherlands and Norway and group 2 the rest; (ii) with the Mediterranean sample, group 1 includes Albania, Israel, Jordan, Lebanon, Macedonia, Morocco, Serbia and group 2 the rest. Reported is the p-value of a U-Mann test for similarities in the median statistic across the groups.

Table 4: Mann U-test (Rank Sum Test) of Similarities across Groups

full sample differences across groups are insignificant; for the restricted set of Mediterranean countries only the concordance index seem to be significantly different. One reason why we fail to detect significant differences across groups when cultural features are used is that the groups that the clustering algorithm creates are not very homogeneous. For example, one group includes Albania, Lebanon but also Luxembourg and Norway. Thus, a larger number of groups is probably needed to capture the heterogeneities present in the data. However, given the small number countries we have in our cross section, cells may end up being empty or with two few units, making the test uninformative.

4.3 Regressions

Next, we relate business cycle characteristics with the institutional and cultural indicators via regression analysis. The top part of Table 5 reports coefficient estimates and t-statistics when the institutional and cultural factors enter individually in the regression; the bottom part the results when the principal component of the institutional and cultural factors is used in the regressions. In all cases, macroeconomic variables enter the regression as controls. *Gov* and FH are generally significant: in agreement with Figure 2, countries with higher governance indicator score tend to have longer expansions and less severe contractions. On the other hand, worse civil liberties records (a higher FH index) are associated with significantly shorter and less vigorous expansions.

Some of the cultural indicators are also significantly related to the business cycle characteristics. In particular, greater power distance is associated with larger output losses during contractions (because of increased amplitude during contractions) while greater individualism implies smaller output losses in such phases (because of decreased amplitude during contractions). In addition, the greater is the masculinity in a society the larger is the duration of contractions. Thus, societies in which individuals are more satisfied with their endeavors are also those less recession prone.

One may argue that institutional and cultural features may not be exogenous to business cycle features, making the causality of the relationship unclear. After all, the recent European debt crisis indicates that the severity of certain recessions may lead to important institutional changes. To give a causal interpretation to the evidence, we have considered two additional regressions with *Gov* and FH indicators, which have a time series dimension, as right hand side variables. However, rather than using their average values over the sample, we use pre-sample values in the regressions. In this way, the hypothesis of reverse causality is much harder to entertain. For the FH indicator, data is available

	Expansion		**Contraction**	
Variable	E-dur	E-ampl	C-dur	C-ampl
Gov	52.61**	0.15	-0.54	-0.14**
	(2.41)	(0.58)	(-0.23)	(2.29)
CBI	18.78	0.09	1.64	-0.013
	(1.23)	(0.53)	(1.03)	(-0.29)
FH	-6.03***	-0.04**	-0.02	0.007
	(-2.93)	(-2.27)	(-0.08)	(1.19)
PDI	-0.09	0.001	0.0004	0.0008***
	(-0.80)	(0.98)	(0.04)	(3.22)
IDV	0.17	-5.78E-06	-0.005	-0.001**
	(1.09)	(-0.003)	(-0.37)	(-2.79)
MAS	0.09	0.001	-0.019**	6.09E-05
	(0.90)	(1.36)	(-2.27)	(0.23)
UAI	-0.032	-0.001	0.0003	6.19E-05
	(-0.30)	(-0.85)	(0.03)	(0.21)
$Gov_{presample}$	31.22*	-0.06	-2.20	-0.13***
	(1.66)	(-0.26)	(-1.03)	(-2.85)
$FH_{presample}$	-2.24	0.017	-0.22	0.008
	(-1.22)	(0.82)	(-1.15)	(1.56)
PC_{inst}	3.22	-0.012	-0.16	-0.012**
	(1.63)	(-0.50)	(-0.72)	(-2.16)
PC_{cult}	-1.16	0.008	-0.06	0.011**
	(-0.61)	(0.41)	(-0.36)	(2.39)

Notes: C-dur and E-dur stand for duration of contractions and expansions; C-ampl and and E-ampl for amplitude of contractions and expansions. Gov is the governance index; CBI is the index of central bank independence;FH the Freedom House index. Pdi stands for power distance index, Ind for the index of individualism, Mas for the index of masculinity and UAI for the uncertainty avoidance index. $Gov_{presample}$ and FH_{sample} denotes the pre-sample values of the indicators. PC_{inst} and PC_{cult} are the first principal component of the institutional and cultural indicators. All the regressions include a constant and the first principal component of the macroeconomic variables. t-statistics in parentheses.

Table 5: Regression coefficients of business cycle features on institutional and cultural indicators.

for most countries since 1972; for the World Bank governance indicators data available since 1996. Overall, the trust of the conclusions remain even though the significance of coefficients decreases:better governance still mitigate outputs losses during contractions and make expansions longer; worse civil liberties make expansions shorter and less vigorous.

Similar conclusions can be drawn when we enter the first principal components of the institutional and of the cultural indicators as right hand side regressors. In, particular, these principal components are important in explaining the difference in the amplitude of contractions, and better institutions mitigating the losses and better cultural features amplifying them in contraction. However, the principal component of the institutional indicators explain less of the heterogeneity in the duration of the contractions and in the amplitude of the expansions and are marginal in explaining differences in the durations of expansions, probably because the CBI index is unrelated to business cycle features.

Table 6 presents the estimated coefficients associating concordance measures with the institutional and cultural indicators, controlling for macroeconomic factors. Here the results are stronger because the number of regression points is considerably larger: the smaller are the differences in Gov, FH and CBI across countries, the more synchronized business cycles are. Cultural indicators are, in general, less correlated with business cycle synchronization and in one case (differences in the masculinity/femininity dimension) results are counterintuitive. Note that the same conclusions obtain when we use the pre-sample values or when the principal components of the three governance indicators, rather than average values of the governance and political freedom indicators separately. Interestingly, the principal component of the four cultural indicators is very significant and the smaller are the differences across countries, the larger is the synchronization of their business cycles.

The Mediterranean basin is an interesting laboratory to study the relationship between business cycles, institutions and culture because countries are in close regional proximity, have similar productive structures but differ substantially in their cultural and institutional features. Standard channels to explain difference in business cycles characteristics are not operative in the Mediterranean (see Canova and Schlaepter (2011)). Thus, it is worth investigating whether institutions and culture explain the heterogeneities and the asymmetries in business cycles that the region displays.

We do not report the estimated coefficients obtained running regressions of the amplitude and the duration of contractions and expansions on institutional and cultural features since the number of degrees of freedom are very small, making asymptotic t-tests a very poor indicators of the significance

	Concordance Index	
Variable	**Full Sample**	**Mediterranean Countries**
Gov	-0.33***	-0.22***
	(-8.00)	(-3.01)
CBI	-0.14***	-0.05
	(-3.29)	(-0.68)
FH	-0.05***	-0.05***
	(-13.14)	(-4.90)
PDI	-9.26E-05	-0.0001
	(-0.43)	(-0.22)
IDV	-0.0004	-0.0006
	(-1.59)	(-0.02)
MAS	0.0006**	-0.002*
	(2.79)	(-1.94)
UAI	0.0002	-0.002**
	(0.83)	(-2.47)
$Gov_{presample}$	-0.025***	-0.025**
	(-4.54)	(-2.05)
$FH_{presample}$	-0.005	0.0009
	(-1.51)	(0.12)
PC_{inst}	-0.022***	-0.018**
	(-5.12)	(-2.25)
PC_{cult}	-0.018***	0.044***
	(-7.44)	(3.05)

Notes: Concordance index stands for the bilateral concordances among individual countries. Gov is the governance index; CBI is the index of central bank independence; FH the Freedom House index. Pdi stands for power distance index, Ind for the index of individualism, Mas for the index of masculinity and UAI for the uncertainty avoidance index. $Gov_{presample}$ and $FH_{presample}$ denote the pre-sample values of the indicators. All the regressions include a constant and the first principal component of the macroeconomic variables. t-statistics in parentheses.

Table 6: Regression coefficients of concordance index on differecnes in institutional and cultural indicators.

of the relationship. Nevertheless, even in this case, better governance and better civil liberties record tend to increase the duration and amplitude of expansions and greater power distance is associated with larger output losses during contractions.

Regression coefficients obtained associating the concordance index with differences in institutional and cultural features in the Mediterranean are in the second column of Table 6 - here the number of degrees of freedom is large and thus asymptotic approximation better behaved. Once again, small differences in Gov and FH are associated with higher business cycle synchronization. Interestingly, differences in cultural indicators also have impact on business cycle synchronization. For example, Mediterranean countries which are less alike in the masculinity/femininity dimension (MAS) and in uncertainty avoidance (UAI) tend to have lower business cycle synchronization. Note that, also in this case, using pre-sample values of the World Bank governance indicator does not change the sign or the significance of the coefficients. When differences in the predicted values obtained using the principal components of the institutions indicators are used in the regressions, the results are still supportive of the idea that institutions and business cycles synchronization are linked. However, contrary to what we have obtained for the full sample, differences in the cultural indicators are associated with larger synchronization. This fact seems to be counterintuitive, since larger differences in individual cultural indicators are associated with smaller cyclical synchronization, and due in part to the presence of a few but important outliers.

In the earlier sections, we documented significant heterogeneities and lack of synchronization in business cycles for the Mediterranean and non-EU Mediterranean countries. The results we have presented account, at least in part, for these heterogeneities: countries with better governance indicators tend to experience less volatile business cycles, have more persistent expansions and are more synchronized. Furthermore, business cycle synchronization is higher in countries with similar cultural traits.

4.4 The evolution of business cycles in the Mediterranean

Given the robust association between governance indicators and business cycles we found, we can obtain some indication of the potential evolution of business cycles for the non-EU Mediterranean countries, by looking at the time profile of their governance indicators. While the institutional characteristics of EU countries have been studied extensively, much less is known about the governance and civil

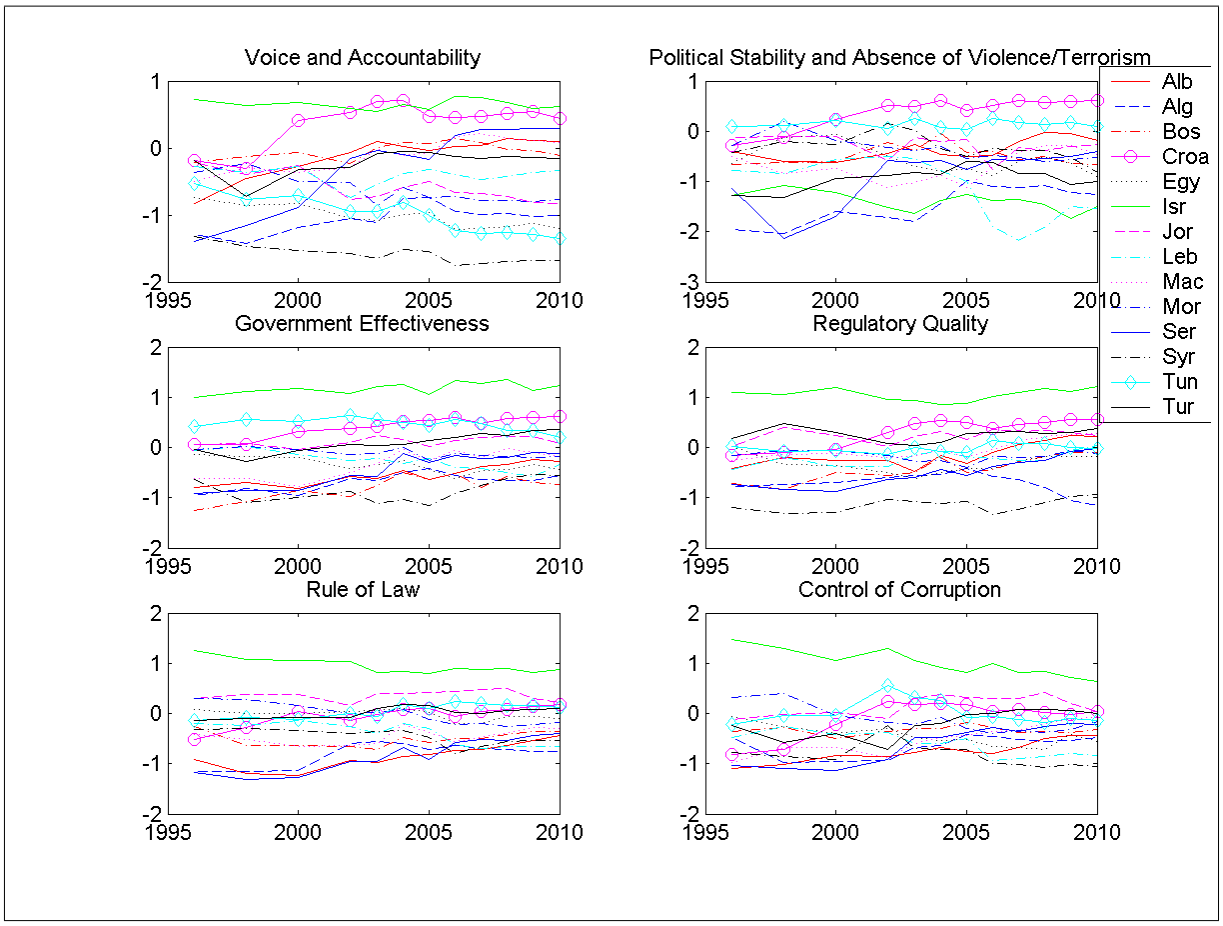

Figure 4: World Bank Governance Indicators over Time

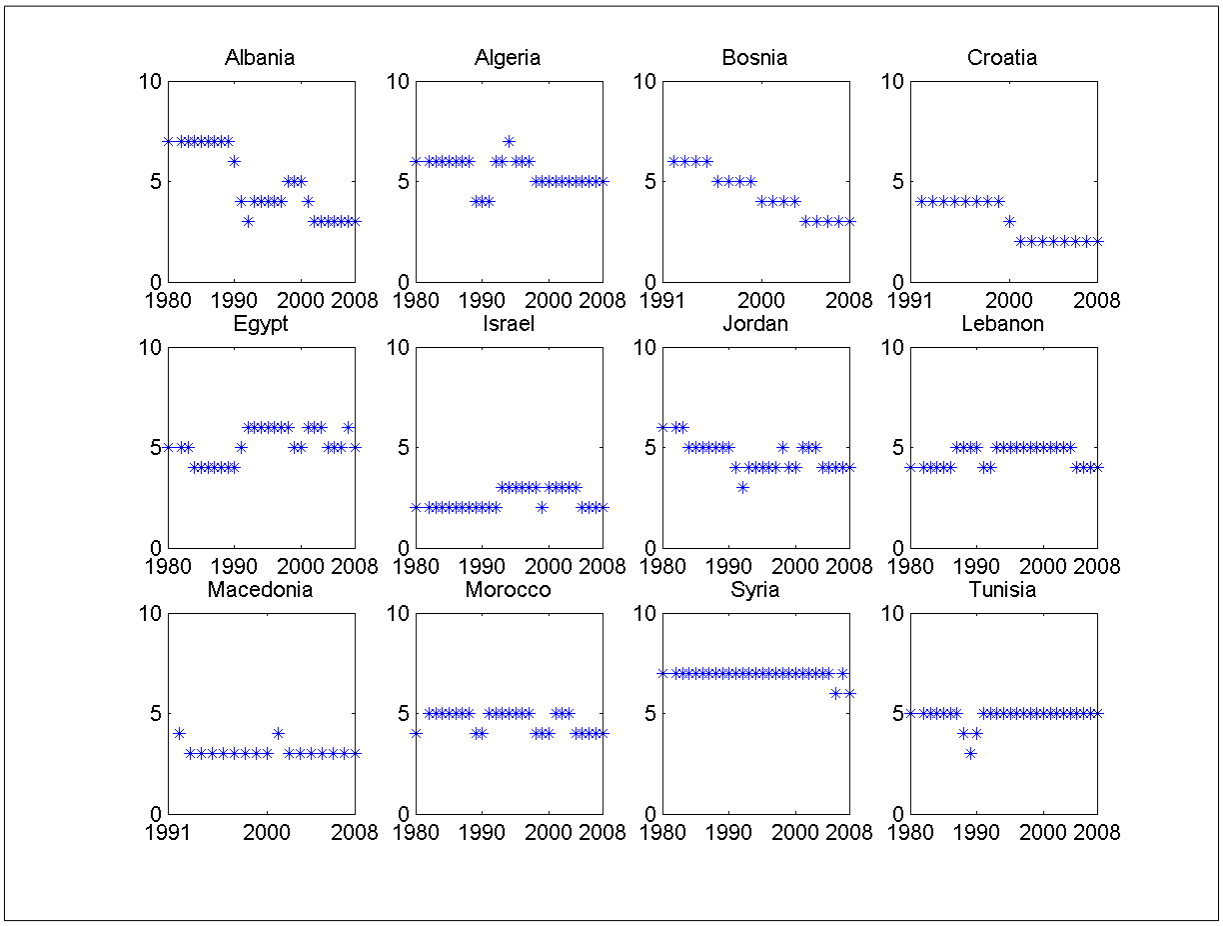

Figure 5: Freedom House Indicator over Time

society indicators for non-EU Mediterranean countries. Figure 4 plots the time series of the different components of the governance indicator, while Figure 5 plots the time series of the Freedom House indicator. We observe that a relatively developed country such as Israel scores the highest on the majority of governance indicators, except for the Political Stability and Absence of Violence/Terrorism item, where it ranks close to Turkey. Balkan countries, such as Albania, Bosnia, Croatia, Macedonia, and Serbia, which are potential candidate countries for the European Union, show improvements over time in these scores. If the past is any indication of the future, this evolution suggests that their business cycle features should begin to resemble more those of the other EU countries, and display more synchronized behavior.

North African and Middle Eastern countries, such as Algeria, Egypt, Jordan, Lebanon, Morocco, or Tunisia, do not display any tendency for improvement, and in some cases, such as Syria or Tunisia, show a marked deterioration. Some North African countries, such as Tunisia, display relatively high scores on such dimensions as Political Stability and Absence of Violence/Terrorism and Government Effectiveness but quite a low score on Voice and Accountability, explaining why they were candidates for the Arab Spring movements. Finally, for Turkey, there are improvement in Government Effectives and Control of Corruption indicators, but the performance on the other World Bank Indicators is flat or occasionally regressing.

A similar picture obtains using the Freedom House indicators. Israel consistently shows low values of FH, indicating the presence of relatively high levels of civil liberties while the scores of Algeria, Egypt, Jordan, Lebanon, Morocco, Syria, and Tunisia are consistently high and almost time invariant, indicating persistently poor performance. For Albania, Bosnia, or Croatia, improvements are present, suggesting that their cyclical characteristics may change as well in the near future.

5 Conclusions

This paper examines the association between institutional and cultural indicators, business cycle features and synchronization for a set of developed, emerging, and developing countries. We find that these factors matter over and above those implied by standard macroeconomic indicators and that similarities in institutional characteristics go hand in hand with greater business cycle synchronization. While in most places we were careful in avoiding causal interpetation of the association, in some instances we are able to strengthen our conclusions and show that improved institutions lead to better

cyclical outcomes.

To the best of our knowledge, we are among the firsts to systematically document the relationship between institutions, culture and cyclical characteristics and to stress the important role of these factors have for cyclical fluctuations. Our findings are important, as the literature focuses on macroeconomic features, such as openness to trade, to financial penetration, distance or commonality of shocks, to explain the cross sectional pattern of business cycle characteristics. Such factors need not be crucial to account for the heterogeneities of business cycle features, at least for the countries we analyze, and perhaps more importantly, taking them into account does not reduce the association between business cycles characteristics and the institutional and cultural features we document.

Our results have crucial implications for policy. Getting the macroeconomic house in order is not necessarily a prerequisite for moderating cyclical fluctuations in emerging and developing economies, but improving the institutional and the cultural framework appears to be. Countries where the rules of the game do not work or where societal norms promote rent-seeking instead of productive activities may continue to function as boom-bust economies, prone to large domestic, regional and global shocks. Development economists have noted that if greater trade and financial liberalization do not go hand in hand with policies that benefit large segments of the population, countries may fail to change their existing growth paths. This seems to be true also for cyclical trajectories: improved institutions could promote more vigorous expansions and less volatile fluctuations. The lack of political stability or the lack of voice and accountability in a society, on the other hand, may prevent the right macroeconomic policies from having their intended effects.

The recent Arab Spring movements have shown that political repression may be associated with economic stagnation and lack of opportunities cannot be sustained, even in societies that share many cultural traits. Our analysis shows that aspects of governance in a society and the civil liberties it enjoys are correlated with business cycle features, and are an important determinant of how synchronized cyclical fluctuations are across countries. While, as economists, are still far from understanding how such institutional features translate into actual policy choices, we can nevertheless offer, based on out results, a simple suggestion: macroeconomic advice given in the absence of the right institutional and governance environment is likely to fall on deaf ears. Our study offers some intriguing findings in this regard, and suggests that improved macroeconomic policies should be implemented together with measures that strengthen civil and political institutions and improve governance in the society.

References

Aguiar, M. and G. Gopinath (2007) "Emerging Market Business Cycles: The Cycle is the trend," *Journal of Political Economy*, 115, 69-102

Alesina, A. and L. Summers (1993). "Central Bank Independence and Macroeconomic Performance: Some Comparative Evidence," *Journal of Money, Credit and Banking* 25, 151-162.

Allen, F. and D. Gale (2007). "An Introduction to Financial Crises," Wharton Financial Institutions Center Working Paper No. 07-20.

Altug, S. and M. Bildirici (2012). "Business Cycles in Developed and Emerging Economies: Evidence from a Univariate Regime Switching Approach," *Emerging Markets Finance and Trade*, forthcoming.

Altug, S., M. Emin and B. Neyapti (2012). "Institutions and Business Cycles," Discussion Paper 8428 CEPR/EABCN No. 61/2012

Altug, S., B. Tan and G. Gencer (2011). "Cyclical Dynamics of Industrial Production and Employment: Markov Chain-based Estimates and Tests," forthcoming *Journal of Economic Dynamics and Control*.

Arnone, M., B. Laurens, J-F. Segalotto and M. Sommer (2007). "Central Bank Autonomy: Lessons From Global Trends," IMF Working Paper 07/88.

Benzcur, P. and A. Ratfai (2010) Business Cycles around the Globe, Central European University, manuscript.

Braudel, F. (1998). *The Mediterranean in the Ancient World*, London: Penguin Books.

Canova, F. and M. Ciccarelli (2012). "ClubMed? Business Cycles in the Mediterranean Basin," forthcoming, *Journal of International Economics*.

Canova, F. and A. Schlaepfer (2011). "Mediterranean Business Cycles: Structure and Characteristics," manuscript.

Canova, F., M. Ciccarelli, and E. Ortega (2012). "Do Institutional Changes Affect Business Cycles? Evidence from Europe," forthcoming, *Journal of Economic Dynamics and Control*.

Chang, Y. and S. Hwang (2011). "Asymmetric Phase Shifts in the U.S. Industrial Production Cycles," manuscript.

Cukierman, A., S. Webb, and B. Neyapti (1992). "Measuring the Independence of Central Banks and Its Effect on Policy Outcomes," *The World Bank Economic Review* 6, 353-0398.

Cukierman, A., G. Miller, and B. Neyapti (2002). "Central Bank Reform, Liberalization and Inflation in Transition Economies – An International Perspective," *Journal of Monetary Economics*, 49, 237-264.

Easterly, W. and R. Levine (2003). "Tropics, Germs, and Crops: How Endowments Influence Economic Development," *Journal of Monetary Economics*, 50, 3-39.

Garcia Cicco, J. R. Pancrazi and M. Uribe (2010) "Real Business Cycles in Emerging Markets," *American Economic Review*, 100, 2510-2535.

Girardin, E. (2005). "Growth-cycle Features of the East Asian Countries: Are They Similar?," *International Journal of Finance and Economics* 10(2), 143-156.

Granato, J., R. Inglehart and D. LeBlang (1996). "The Effect of Cultural Values on Economic Development: Theory, Hypotheses, and Some Empirical Tests," *American Journal of Political Science*, 40, 607-631.

Grilli, V., D. Masciandro and G. Tabellini (1991). "Political and Monetary Institutions and Public Financial Policies in the Industrial Countries," *Economic Policy* 13, 341-392.

Hall, R., and C. Jones (1999). "Why Do Some Countries Produce So Much More Output per Worker than Others?" *Quarterly Journal of Economics*, 114, 83-116.

Harding, D. and A. Pagan (2005). "A Suggested Framework for Classifying the Modes of Cycle Research," *Journal of Applied Econometrics* 20, 151-159.

Harding, D. and A. Pagan (2006). "Synchronization of Cycles," *Journal of Econometrics* 132, 59-79.

Hofstede, G. (1980). *Culture's Consequences: International Differences in Work-related Values*, Beverly Hills, CA: Sage Publications.

Imbs, J. (2010). "The First Global Recession in Decades," CEPR Discussion Paper No. 7973.

Kaufmann, D., A. Kraay and M. Mastruzzi (2009). "Governance Matters VIII: Aggregate and Individual Governance Indicators, 1996-2008," World Bank Policy Research Working Papers, No.4978.

Knack, S. and P. Keefer (1995). "Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures," *Economics and Politics*, 7(3), 207-27.

Kose, A. and E. Prasad (2010). "Emerging Markets. Resilience and Growth amid Global Turmoil," Brookings Institution Press, Washington, DC.

Krolzig, H.-M. and J. Toro (2005). "Classical and Modern Business Cycle Measurement: The European Case," *Spanish Economic Review* 7(1), 1-21.

Male, R. (2011). "Developing Country Business Cycles: Characterizing the Cycle," *Emerging Markets Finance and Trade*, 47 (Supplement 2), 20-39.

Neyapti, B. (2009). "Performance of Monetary Institutions: Comparative Evidence," Bilkent University Discussion Paper 09-02.

North, D. (1990). *Institutions, Institutional Change and Economic Performance*, Cambridge: Cambridge University Press

Rand, J. and F. Tarp (2002) "Business Cycles in Developing Countries: Are They Different?" *World Development* 30(12), 2071,2088.

Rodrik, D., A. Subramanian, and F. Trebbi (2002). "Institutions Rule: The Primacy of Institutions Over Geography and Integration in Economic Development," IMF Working Paper 02/189 (Washington: International Monetary Fund).

Rose, A. and C. Engel (2002). "Currency Unions and International Integration," *Journal of Money, Credit and Banking* 34, 1067-1089.

Tabellini, G (2010). "Culture and Institutions: Economic Development in the Regions of Europe.", *Journal of the European Economic Association*, 8, 677-716.

Weber, M. (1904). *The Protestant Ethic and the Spirit of Capitalism*. 1976 ed. London: George Allen and Unwin.

A Data Appendix

Country	Sample Period	Measure	Country	Sample Period	Measure
EU					
Austria	1988:1-2009:1	Real GDP	Slovenia	1993:1-2009:1	Real GDP
Belgium	1980:1-2009:2	Real GDP	Spain	1960:1-2009:2	REal GDP
Bulgaria	1994:1-2009:1	Real GDP	Sweden	1960:1-2009:2	Real GDP
Cyprus	1980:1-2010:1	IP Index	UK	1960:1-2009:2	Real GDP
Czech Republic	1994:1-2009:2	Real GDP	**Non-EU**		
Denmark	1990:1-2009:2	Real GDP	Albania	1990:1-2011:2	Real GDP
Estonia	1993:1-2009:1	Real GDP	Algeria	1992:1-2009:4	IP Index
Finland	1960:1-2009:2	Real GDP	Bosnia	1998:1-2011:2	Real GDP
France	1970:1-2009:2	Real GDP	Croatia	1994:1-2008:4	Real GDP
Germany	1960:1-2009:2	Real GDP	Egypt	2000:1-2009:1	Real GDP
Greece	1970:1-2009:1	Real GDP	Iceland	1997:1-2009:1	Real GDP
Hungary	1995:1-2009:1	Real GDP	Israel	1980:2-2009:2	Real GDP
Ireland	1997:1-2008:4	Real GDP	Jordan	1991:1-2009:1	Real GDP
Italy	1960:1-2009:2	Real GDP	Lebanon	1992:1-2009:1	IP Index
Latvia	1993:1-2009:1	Real GDP	Macedonia	1990:1-2011:2	Real GDP
Lithuania	1995:1-2009:1	Real GDP	Montenegro	2001:1-2011:2	Real GDP
Luxembourg	1995:1-2008:4	Real GDP	Morocco	1988:1-2009:1	Real GDP
Malta	1997:1-2009:1	Real GDP	Norway	1978:1-2009:1	Real GDP
Netherlands	1960:1-2009:2	Real GDP	Serbia	1997:1-2011:1	Real GDP
Poland	1995:1-2009:1	Real GDP	Switzerland	1980:1-2009:2	Real GDP
Portugal	1995:1-2008:4	Real GDP	Syria	2000:1-2011:1	Real GDP
Romania	1994:1-2009:1	Real GDP	Tunisia	1992:1-2009:1	IP Index
Slovakia	1993:1-2009:1	Real GDP	Turkey	1987:1-2009:2	Real GDP

Table A.1: Sample of Countries

Table A.1 lists the countries used in our study together with the data sources and sample periods. When GDP is not available, we used data on the industrial production index. GDP is measured at constant prices, in units of the national currency, and it is available for Canada, France, Germany, Italy, Japan, the US, the Netherlands, Finland, Sweden, and Morocco in de-seasonalized form. The remainder of the data were de-seasonalized using the X11 linear de-seasonalization method.

Data on the institutional indicators are derived from the following sources and measure the following aggregates:

- The Worldwide Governance indices provided by the World Bank (see Kaufman, Kraay and Mastruzzi, 2009) measures different dimensions of governance grouped as voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption. This indicator is constructed for 212 countries and territo-

ries bi-annually for 1996, 1998, 2000 and annually for 2002-2010. We combine these six groups of governance indicators under one index, denoted as Gov, by taking the average of the normalized indices such that a number close to one indicates good governance.

- The Civil Liberties Index prepared by the Freedom House (FH). Data are available annually from 1972-2008 for 192 countries and 18 disputed and related territories. The Civil Liberties index measures freedom of expression, assembly, association, and religion. Freedom House rates civil liberties on a scale of 1 to 7, with 1 representing the most free and 7 representing the least free.

- Indices of central bank independence (CBI) provided by Cukierman *et al.* (1992, 2002) and extended by Arnone *et al.* (2007). This is a legal index that aggregates 16 characteristics of central bank (CB) charters, including variables measuring the allocation of authority over monetary authority, procedures for resolution of conflicts between the CB and the government, the relative importance of price stability in the charter of the CB, the nature of limitations on lending by the CB to the government, and procedures for the appointment and dismissal of the governor of the CB.

Data on the cultural indicators are obtained from the study of organizational motivation across countries run by Geert Hofstede (http://geert-hofstede.com), who considers five separate dimensions – "power distance", "individualism", "masculinity/femininity", and "uncertainty avoidance".