

CENTER ON CAPITALISM AND SOCIETY

COLUMBIA UNIVERSITY

<http://www.capitalism.columbia.edu/>

Working Paper No. 60, July 2010

DYNAMISM AND ECONOMIC PERFORMANCE: A PRELIMINARY REPORT[†]

Raicho Bojilov^{*} and Edmund S. Phelps^{**}

[†] This paper is the first step in a research effort, renewed in 2008, to study economic dynamism: its cultural sources and its benefits for economic performance. It follows papers in the previous effort on the importance of economic culture by Phelps (2006) and by Phelps and Zoega (2007). We are immensely grateful to the Ewing Marion Kauffman Foundation for its steadfast support of this project. The present effort began with Luminita Stevens of Columbia University. Unfortunately, she could not continue working on it owing to her other commitments. We are most grateful to her for her early interactions.

^{*} Ph. D Candidate in Economics. Department of Economics, Columbia University, 1022 International Affairs Building, 420 West 118th Street, New York, NY 10027.

^{**} McVickar Professor of Political Economy and Director, Center on Capitalism and Society, Columbia University. He is the recipient of the 2006 Nobel Prize in Economics.

ABSTRACT

This paper is a step in the identification of the determinants of performance in developed economies. A basic finding is that differences in beliefs and attitudes concerning the workplace account for most of the differences in performance. Another finding is that there are four main dimensions, or categories, in which individuals differ in workplace beliefs and attitudes. We find that the most important of them for performance, as we might have suspected, is the one we labeled vitalism. This is followed by materialism (as measured by preference for consumption over leisure), social trust, and self-reliance. We also find that differences in institutional environment have little explanatory power once we control for beliefs and attitudes.

1. Dynamism and Economic Performance

This paper investigates the extent to which differences in economic performance among developed economies can be traced to differences in measures of economic dynamism and economic culture. By a nation's economic dynamism we mean how keen and able it is to achieve commercial innovation: to conceive, develop, screen, and embed new commercial ideas into uses by enterprises and households. By a nation's economic culture we mean beliefs and attitudes that influence individual goals and conduct in social relations.

We seek to identify an appropriate set of measures that capture a country's economic dynamism, to determine the relationship between dynamism and economic culture, and to isolate the contribution of these two dimensions of an economic system to a country's overall economic performance and well-being. We explore the possibility that these beliefs and attitudes are also at least partially responsible for what we describe as conditions for innovation and proclivity to innovate. The conditions for innovation refer to the environment in which innovation takes place. The proclivity to innovate, on the other hand, represents the inclination of the economic agents to engage in activities that lead to innovation. Our first hypothesis is that differences in our measure of dynamism can be partially explained by differences in individual attitudes and beliefs that foster innovation, creativity and growth in the workplace. We consider economic beliefs and attitudes, the conditions, and proclivity to innovate to be the components that constitute dynamism.¹ Our second hypothesis is that,

¹ See diagram 1 for graphical illustration.

differences in dynamism in turn lead to differences in job satisfaction, participation in the labor force, productivity and overall well-being. We also hypothesize that beliefs and attitudes may have a direct effect on economic outcomes, independent from their effect through the conditions for innovation and the proclivity for innovation.

This framework abstracts away the effect of history and fluctuations. We are aware that many factors contribute to the actually realized innovation and to economic performance, such as historical events or pure luck. The way these additional factors relate to the other components of our analysis can be examined in diagram 1: in the language of information theory, they transform observed innovation and economic outcomes into noisy signals about the relation between dynamism and economic outcomes.

We test these hypotheses using individual-level data from the World Values Surveys 1981-2005 (WVS) and country-level data for a sample of 18 OECD economies². To our knowledge, this is the first study that seeks to relate individual beliefs and attitudes about the workplace to dynamism and in turn to final economic outcomes.

We find significant differences in attitudes and beliefs about the workplace across countries. Importantly, the consumption-leisure tradeoff is not the *main* dimension along which beliefs and attitudes differ. Indeed, non-pecuniary considerations about the workplace, described in the text as vitalism, are more important for economic outcomes than the standard consumption-leisure tradeoff. We find that these differences in attitudes can explain cross-country variation in objective measures of economic performance, such as productivity, participation and activity rates.

The rest of the paper is organized as follows. Section 2 motivates the empirical study by showing the existence of persistent country-level differences in economic performance. After presenting the data, section 3 discusses our factor analysis of economic beliefs and attitudes. Section 4 switches the focus to the investigation of the hypothesized relations through regression analysis on country-level. The paper concludes by discussing some implications and possible future research in section 5.

² The countries included in the study are: Austria, Belgium, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, UK, USA. The choice of country is determined, as usual, on the basis of data availability.

2. Economic Thought and Dynamism

Even across countries of presumably similar level of technological development, economic performance varies significantly. Widely available statistics, such as total factor productivity, participation and activity rates, as well as unemployment levels suggest persistent differences in the economic performance across countries. Classical economics can provide little insight in the study of such differences. It has largely ignored or assumed away differences across OECD countries and instead has focused on studying differences between the developing and the developed world. Even in this more restricted context, classical economics has had only a very limited success.

One popular alternative framework posits that the economic institutions in the capital, labor and product markets have significant effect on the functioning and the performance of the economy. Kydland and Prescott (1990) provide a set of stylized facts suggesting a negative relation between taxation on employment and participation. Hoon and Phelps (1997) show that in a closed economy, a shift to increased payroll taxation raises the natural rate of unemployment under some specifications. Yet, Hoon and Phelps point out that in a *small open economy*, in which the interest rate is given by the world rate, the tax shift is *neutral* for employment. This framework draws strength from plentiful evidence that the economies that have suffered low economic performance from since the early 1990 (until 2008 at any rate) happened to be those that had adopted institutions understood to be “bad”, such as excessive regulation of labor markets, red tape, controls on capital and trade flows, etc. For example, Prescott (2004) compares the tax system and government transfers in the US and the EU and relates these differences to the differences in their economic performance. Aghion and Howitt (1998, 2005) provide a more detailed overview of the related literature.

Our approach is related to this strand in the literature and yet differs in two key aspects. First, we attempt to relate the characteristics of an economy to individual attitudes and beliefs. Second, we focus on the conditions for innovation and the proclivity to innovate rather than on protection of property rights, excessive regulation and the like. The difference may appear subtle at first sight, but it is quite substantial as will be seen later.

Hayek (1948, 1967/68) began the theory of dynamism in economies, building on insights of David Hume and Henri Bergson. Every individual, Hayek says, has some knowledge called “know-how,” which is practical, concrete. It is often inexplicable in formal scientific terms – that is, “personal knowledge.” Such knowledge develops on the borderline of the known with the unknown. Bergson (1911) argues that this knowledge is the driving force behind any action, the force of life itself. In a suitably structured economy, new commercial ideas may emerge as the actors combine their Hayekian know-how with their Humean imagination.

A decentralized system providing great latitude and incentive gives the best chance for such entrepreneurial ideas to be born, developed, tried and adopted – to become innovations. In such a system the human actors are able to experiment and explore the unknown, welcome change and look for new opportunities, develop and introduce new methods and solutions. The system welcomes and quickly tries out the new ideas that are brought to it. In addition, suppliers of finance seek to back among the available new ideas ones that will turn out to be innovations and to refuse backing to ones that will fail. Many of the ideas finding backing would be deemed to be too opaque and uncertain to merit any investment under alternative economic systems such as centralized or corporatist economies. In the short run, a decentralized system of dynamism may appear to be inefficient or even inferior to an alternative based on a greater level of coordination of economic activity. However, it is a reasonable hypothesis that, in the long run, the system that offers the better *conditions* for innovation, since it allows for the development of more and better products and methods and thus provides a more rewarding workplace in the process. But the willingness, or proclivity, to innovate also matters for the rate of innovation. Thus the *dynamism* of an economy is two-pronged.

3. Testing for the Roots of Economic Dynamism

This section starts with a brief account of the data sources, followed by an account of the methodology that we employ to recover the unobserved structure of beliefs and attitudes about the workplace. Then it presents the main dimensions of individual beliefs and attitudes about the workplace and finish with a description of the conditions for innovation and the proclivity to innovate.

3.1. Sources

The data from the World Values Surveys 1981-2001 (WVS) includes the answers of individuals from 18 OECD countries to a set of 53 questions related to beliefs, attitudes, and values associated with the workplace. Factor analysis is employed to recover from these data the underlying structure of beliefs and attitudes that people hold about the workplace. The set of variables in the data set has been determined in the following way. At first, the data set included all variables that may be remotely related to the workplace. Then, in the early preliminary tests, some of these variables were dropped on the basis of their poor performance. For example, many cultural variables, such as attitudes towards marriage, foreigners, and different religions were initially included. Appendix 1 provides a brief description of these variables used in the currently presented empirical study, along with the scale of measurement and the corresponding code.

The country-level variables that are used for studying the level of dynamism are very popular indicators and reported in the World Development Indicators, OECD Outlook, and Fraser Institute.

3.2. Methodology

We exploit the richness of the WVS dataset by employing principal components analysis (PCA). Each observed variable can be decomposed into a linear combination of the unobserved components plus an idiosyncratic residual term. This approach enables us to reduce a large number of variables of potential interest to a small number of components that adequately capture the variability in the original data. We interpret the extracted components based on the variables that are most strongly associated with each component.

A key assumption for the joint identification of the components and the loadings is that the loadings are the same for all individuals, across all the countries in the sample. Hence, the linear relationship between the principal components and the raw data is the same across countries. A second key assumption is that the idiosyncratic residual terms are uncorrelated across individuals. These assumptions may appear very restrictive, especially for a dataset that includes multiple countries with multiple observations in each country. These assumptions would be violated if there were differences between the *within-country* variation and the *between-country* variation for the variables of interest. However, performing PCA for each country separately yields results that are similar to the pooled PCA results. This check suggests that within-country variation is not significantly

different from between-country variation. Hence, we can extract common components from the pooled sample³

3.3. Dimensions of Economic Culture

The main dimensions along which workplace attitudes and beliefs differ are vitalism, materialism, social trust, and independence. Their characteristics are discussed in some detail below. The significant loadings for each principal component are also presented in Table 1. The technical details about the principal component analysis can be found in Appendix 2.

Vitalism

The most important component loads heavily on non-pecuniary aspects of the workplace. It represents a very strong preference for jobs that give their workers the freedom and the opportunity to seize the initiative and act according to their own judgment, while keeping in mind the broader set of objectives set by the management. It also stands for a particular attitude towards or view of the workplace, which emphasizes the importance of work for one's self-fulfillment through achieving "something," whose value is recognized by the community. This component has characteristics that appear to be close to the hypothesized sources of dynamism and for the rest of the paper will be referred to as vitalism. Strikingly, no pecuniary aspects of the job seem to be driving the expressed need to find self-effectuation through one's work and the drive to act, explore, and innovate. According to the analytical framework adopted in this paper, this component should have a positive and significant effect on both dynamism and economic performance. In the following regressions, most of the attention will be focused on the significance, magnitude, and sign of its coefficient.

Materialism (Preference for Consumption over Leisure)

This component represents an overwhelming concern with pay, hours, work-related pressure and stress, holidays, and the convenience of the schedule. In this sense, the second most important component captures

³ The principal components analysis in this paper also relies on the assumption that the underlying structure is linear. This assumption may be relaxed at the cost of much greater technical complexity. Moreover, the analysis was originally developed for variables that follow a multivariate normal distribution. Gorsuch (1983) shows that even in the case of the discrete variables associated with questionnaires, sufficiently large samples and sufficiently high Pearson correlation coefficient factor analysis is justified. The sample considered in this study is very large and there appears to be a sufficiently high level of communality across the variables to warrant the use of PCA.

the traditional pecuniary considerations that are represented by a high marginal utility of consumption. What is the expected effect of such preferences on the level of dynamism and economic performance? Clearly, output and the level of job satisfaction may be expected to decline. Furthermore, the measure of observed productivity, output per unit of time, may be expected to decline.

Social Trust

This component appears to stand for the belief that other people and existing institutions can be trusted. Social trust translates into willingness and ability to cooperate with coworkers, as well as coordinate production. Critics of neo-neoclassical contract theory observed long ago that rarely do there exist contracts, in particular labor contracts, that fully specify one's duties, responsibilities, and relations with the management and coworkers, so some trust is required for much activity to take place. And in fact employers and employees typically agree on what is acceptable and what is not acceptable at the workplace. Banfield (1958) was the first contemporary to emphasize the importance of social mores for economic outcomes. Phelps (1973) also explored the relation between altruism, morality, and economic theory. In a broader context, Putnam (1994) came up with a statistical test with which to argue that a country or parts of a country seem to have a "civic society" – a tradition of observing implicit or self-enforcing contracts – that allows its economies to advance farther. Aghion, Algan, Cahuc, and Sheifer (2008) argue that social distrust leads to more explicit and detailed regulation, which in turn decreases economic performance. However, social trust may have a darker side if it is conducive to corporatist responses to economic problems. For this reason, the expected effect of this component on dynamism and economic performance remains unclear.

Self-Reliance

This component captures a certain degree of rebelliousness, a preference for independence and perseverance, as well as a questioning of authority. While willingness to follow orders is crucial to any organized economic activity, equally important is the ability and willingness to lead. A successful and timely alteration between these two seems to be part of the secret of success at the workplace. Hence, a society that exhibits a balance between components 3 and 4 may outperform less diverse societies.

The rest of the retained components are specific in their nature. Components 5 to 9 summarize into one a number of variables that are related to the same question asked in a number of different ways. For example, *Component 5* stands for political engagement and activity and loads heavily on the two variables that are strongly related to political activity and parties. *Component 6* reflects religious considerations related to the workplace, *Component 7* captures altruism and compassion for the suffering of other human beings, *Component 8* art and *Component 9* “good living,” as captured by disproportionate importance accorded to leisure and friends. *Component 10* captures beliefs that competition is harmful and more government intervention is desirable. It also reflects a certain degree of individualism, of “knowing best.”

3.4. Conditions for Innovation and Proclivity to Innovate

The index measuring the conditions for innovation includes is a simple average of the following variables: cost of starting a new business, procedures to enforce a new contract, procedures to enforce a contract (number); employment rigidity; time required to start a new business, and time required to resolve insolvency. The index for proclivity to innovate is a simple average of the following variables: stocks turnover, as an indicator of efficiency of stock markets; patent applications by nonresidents, as a measure of the attractiveness of local market to entrepreneurs who would like to start a new business; patent applications by residents, as a measure of the availability of new products; trademarks by residents, representing the introduction of new products by local entrepreneurs; and trademarks by nonresidents, as a measure of foreign perceptions of the attractiveness and willingness to try new products.

Looking only at the number of bureaucratic procedures, continental Europe does not look too bad relative to the US, the UK, and Canada. However, the time (in days) that is required to build a warehouse, to register a property, etc. is embarrassingly longer in Europe than in the US and Canada. The cost of starting a business as a percentage of gross national income is the lowest in the US, followed by Canada, Sweden, and the UK. It is the highest in Italy, Spain, and Portugal. The number of patent applications by nonresidents measures the attractiveness of the local market as a place to try out new products. The US has the highest absolute number, which indicates that the country is the place where entrepreneurs test the potential for success of their ideas. In contrast, the country with the highest number of patent applications (driven by patent applications by residents) is

Japan. Trademarks can be interpreted as successfully realized ideas. In this context, the US (in absolute number) and Canada (in relative) attract the greatest number of foreign entrepreneurs with established products. The US also appears to be the global leader in the number of trademarks owned by residents. The value of the traded stocks can be interpreted as a measure of the availability of credit for new ventures. The largest stock market is (not surprisingly) the US and it also has the highest turnover of stocks. In terms of G7, Italy and Germany have the smallest stock market and along with France also the lowest turnover. The absolute minimum in OECD is reserved for Belgium, Austria, and Portugal.⁴

3.5. Conditions for Innovation and Proclivity to Innovate

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4. Empirical Analysis

The discussion in section 1 suggests several hypotheses, which are explored in our country-level empirical analysis. We start with a descriptive analysis of the beliefs and attitudes, as well as the conditions and proclivity to innovate. Then, we outline our empirical methodology and turn to the result. The country-level regressions suggest that economic beliefs and attitudes are strongly related to both subjective and objective economic outcomes.

4.1. Descriptive Analysis

Table 1 presents the beliefs and attitudes across the G7 countries. Vitalism is highest in the US, Canada, and Germany and lowest in France, then Italy, and then the UK. That is, the Americans see work as central to their self-fulfillment in life, while in continental Europe people see work as means to achieving a comfortable living that allows them to get on with the rest of their lives. With respect to the consumption-leisure tradeoff, the French exhibit the strongest preference for the material comforts of life, followed by the Canadians and the Americans, and at the other extreme are the Japanese, then the Italians, and then the Germans. The highest level of social trust is recorded in the US followed by Canada, while the lowest level is found in Italy, Japan, and Germany. In view of Putnam (1993), the low level of social trust in Italy may not appear surprising but the low ranking of Germany and Japan may. To interpret these results, one

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needs to look in greater detail in the components that constitute social trust. These include faith in the ability of social and political institutions to resolve conflicts and find solutions to social problems. Consequently, the low levels of the social trust indicator may reflect the troubles that these societies had with their collective decision-making in the past. With respect to the fourth principal component, self-reliance and individualism, the UK and Canada score the highest with the US distant third, while Germany ranks the lowest.

The last two columns of Table 1 summarize the conditions for innovation and the proclivity to innovate across the G7 countries. The conditions for innovation appear to be similar across all major developed economies, except Italy. The Italians suffer from a higher degree of red tape and obstacles in their efforts to design new products, start, expand or contract their business. While the US and Canada are still ranking at the top, most countries in continental Europe do not lag behind much. This finding suggests that differences in market institutions and regulations will not be able to account for the observed differences in economic performance between the US and continental Europe. On the other hand, the proclivity to innovate varies widely across countries in a manner similar to the way vitalism does. The proclivity is highest in the U.S. while the biggest continental economies are all clustered at the bottom.

Thus, the descriptive analysis of beliefs and attitudes presents two extremes and all other countries appear to be somewhere between them. One extreme is the US, where work is central to life and absorbs a lot of the creative energy of the individuals. Social life appears to be centered around self-realization, social recognition and achievement at the workplace. At the other extreme is Italy, where work is perceived as means to provide for other aspects of life deemed equally, if not more, important: one's partner, family, friends, hobbies, leisure, etc. The summary statistics for the conditions and proclivity to innovate broadly conform to the descriptive analysis of beliefs and attitudes; in particular, the US and Italy are again the two extreme cases.

4.2. Estimation

There are a number of possible measures of well-being. The obvious candidates include some "objective" outcome measures, such as productivity, the participation rate, and the economic activity rate. Good arguments can be advanced for and against each of them: each captures an important aspect of what we intuitively understand by well-being or outcome and, yet, each measure misses an important

aspect. Within this context, it is natural to apply factor analysis again. Limited availability of subjective measures over time has limited our analysis to objective measures of well-being. This fact and the limited number of “hard” measures force us to evaluate the effect of the level 1 and level 2 indicators on each outcome variable separately. For each outcome variable, we consider the following set of five models.

The section on economic beliefs, dynamism, and their effect on dynamism suggests that the conditions for innovation and proclivity to innovate are positively related to the outcome variables, such as productivity, activity rate, and participation rate. This hypothesis is tested with Model 1. In addition to the conditions for innovation and proclivity to innovate, Model 1 also incorporates year dummies to capture any intertemporal effects on the outcome variables. Model 2 adds the components representing economic beliefs and attitudes to the explanatory variables already present in Model 1. By doing so, Model 2 allows for a “horse-race” between economic culture, on one hand, and the conditions for innovation and proclivity to innovate. Thus, it is a test whether beliefs and attitudes, on one hand, and conditions and proclivity, on the other, have an independent effect on outcomes. Model 3 is a variation on Model 1: although it excludes beliefs and attitudes, it adds to the set of explanatory variables several macroeconomic policy indicators, such as income tax, expected dependency ration in 2050, social transfers, etc. Consequently, Model 3 tests whether there is any significant relation between the outcome variables and the conditions and proclivity to innovate, controlling for the effect of standard macroeconomic policy.⁶

Model 4 introduces both economic beliefs and attitudes and the standard macroeconomic policy controls. By doing so, it tests whether the conditions for innovation and proclivity to innovate have an independent explanatory effect on outcome. Alternatively, it could also be interpreted as a test whether economic beliefs and attitudes have an independent effect on outcomes, controlling for conditions, proclivity, and standard macroeconomic policy indicators. Finally, Model 5 imposes a simple panel data structure on the dataset by allowing for country-specific time-invariant effects. Within this context, the estimation of the effect of culture, the conditions and

⁶ We have considered a large set of macroeconomic indicators and chose to include in the specifications the ones with significant explanatory power in at least one of the considered specifications. The initial set of explanatory variables included: income tax, wealth, government transfers, labor protection, unionisation, saving rate, working age population, expected dependency ratio, etc.

proclivity depends on the appropriateness of random effects for the estimation of the model. This is established in a series of Hausman tests reported at the bottom of each table.

Estimation method is based on OLS/GLS and panel data RE. To address possible concerns about reversed causality, we use economic beliefs and attitudes in the early 1990s to predict economic outcomes in the late 1990s and the 2000s. Consequently, we also implicitly assume that there is high correlation between beliefs and attitudes over time, at least within a 20-year period. The most restrictive assumption that we make is that a static panel data model is appropriate for the empirical analysis: it presupposes that the effect of temporary shocks on the outcome variables dies out within 3-4 years, and that there is no persistent process that affects both outcomes and economic beliefs and attitudes.

4.3. Results

First, we discuss the empirical results when productivity is the outcome variable. Model 1 shows that better conditions for innovation have a significant positive effect on productivity. Surprisingly, the proclivity to innovate does not appear to have much of a role, while the year dummies are significant. The results indicate that the conditions to innovate not only cease to have a significant effect but also switch signs. Thus, they indicate that the conditions to innovate had a positive effect in Model 1 only because it was representing the effect of culture on productivity. On the other hand, proclivity to innovate becomes significant under this specification. Among the economic beliefs and attitudes, vitalism is not significant and has the wrong sign, strong preference for leisure over consumption, as well as high levels of social trust, appears to have a positive effect on productivity. After the introduction of the controls in Model 3, both the conditions for innovation and the proclivity to innovate cease to be significant. The results reported under Models 2 and 3 strongly suggest that the conditions for innovation and proclivity to innovate do not survive the introduction of controls or economic beliefs and attitudes. Yet, they also yield some puzzling estimates that cast doubt on the validity of the estimates. Models 4 and 5 attempt to address this problem.

Even after the introduction of controls the conditions and proclivity have no significant effect on productivity *independent* of beliefs and attitudes. Nevertheless, the results here show that *all four of the variables representing beliefs and attitudes have the expected*

signs and are significant. In particular, vitalism has a positive and significant effect on productivity. The results suggest, however, that the indicator interpreted as materialism, or consumerism, namely the preference for consumption over leisure, and the social trust indicator do have the greatest effect on productivity.

Among the control variables, employment protection has a negative effect on productivity, while social transfers have a small but positive effect on productivity. Finally, the expected dependency ratio in 2050 has a negative effect. As expected, the introduction of a country-specific effect decreases the precision of the estimates, so some of the estimated effects cease to be significant under Model 5.

These results suggest the following conclusions. First, both macroeconomic controls and economic beliefs and attitudes appear to be significantly related to productivity. Thus, Models 4 or 5 provide a better framework for analysis than Models 1 to 3. The results suggest that the conditions for innovation variable and the proclivity to innovate variable do not have an *independent* effect on productivity *on top of* the economic beliefs and attitudes. On the other hand, economic beliefs and attitudes do have a positive and significant effect on productivity. Interestingly, the results suggest that vitalism has a smaller effect on productivity than the more “old-fashioned” consumption-leisure tradeoff and social trust.

Table 5 presents the empirical results when the dependent variable is the activity rate, defined as the ratio of employed workers to working age population. The results for the activity rate are broadly consistent with the results above. In model 1, the coefficient of conditions for innovation is significant and positive. The conditions for innovation continue to have a positive effect on the activity rate, even after introducing economic beliefs and attitudes under Model 2. Interestingly, the introduction of controls in Model 3 makes both conditions and proclivity to innovate significant and positive. This positive effect on the activity rate remains even under Models 4 and 5 but its statistical significance declines. Still, the proclivity to innovate has a significant effect on the activity rate under the random effects specification. The most striking difference between the results for the activity rate and the results for productivity is that under the current specification *vitalism* has a *large, positive, and statistically significant* effect unlike any of the other beliefs and attitudes. In accordance with our intuition, a preference for leisure over consumption decreases the activity rate. It is also possible that low levels of social trust entices

people to enter the labor force, since they do not expect that they can rely on support from the rest of society. Among the controls, income tax has a small negative and statistically significant effect on the activity rate, as the standard analysis concludes, correctly or not.

Finally, Table 6 presents the empirical results when the participation rate, defined as the ratio of the labor force and the pool of potential workers, becomes the dependent variable. In Model 1, both the conditions for innovation and proclivity to innovate are significant, but the proclivity to innovate has a negative effect on participation, which is hardly intuitive. The troublesome negative effect, however, disappears in Models 2 to 5. Similarly to the results reported in table 5, vitalism has a large, positive, and statistically significant effect on the participation rate, while the rest of the significant beliefs and attitudes affect participation negatively. The greatest difference between the specification for the activity rate and the participation rate is that the conditions for innovation do have a significant positive effect on participation but not on the activity rate. This fact seems to suggest that the conditions for innovation create an economically inclusive society, but on their own their own they are not strong enough to generate a labor market dynamics that ensures high level of employment.

5. Conclusions

This paper has presented an alternative approach to study the persistent differences in the economic performance of developed countries and showed that some crude empirical evidence support its main hypothesized causal relation. In the *individual-level* analysis, we sought to uncover the underlying structure of individual preferences about the workplace using factor analysis. Our main finding is that it oversimplifies the motivations of workers to suppose that only the tastes or taxes that determine the way consumption is “traded off” for leisure drive individual decisions. The results here indicate that what is most important in accounting for differences in economic performance is not the indicator of materialism, or consumerism, but rather the indicator that approximates the spirit of vitalism: the drive to explore, innovate, seize the initiative, introduce new products, design new methods, and so forth. It may very well be that the view of individuals’ incentives in the workplace that has dominated conventional economics is partly to blame for the inability of this economic tradition to explain the existing differences in economic performance.

Moreover, our *country-level* analysis shows that economic culture and economic performance, in particular vitalism, are strongly related. However, we do not find substantial evidence for an *independent* effect of the conditions for innovation and the proclivity to innovate once we control for the effect of beliefs and attitudes.

These findings suggest the breathtaking conclusion that economic beliefs and attitudes may be able to explain by themselves the observed persistent differences in the economic performance of countries of similar technological and social development. It appears now that when Alexis de Tocqueville, writing in the 1830s, took the position that the differences in the economic culture of a country (its “characteristic virtues”) from that in another economy matter “less” than the “conditions” present in the economy, he was 180 degrees to the truth. The truth, it now appears, is that the “conditions” for innovation and likewise the proclivity to innovate are creatures of the economic culture. And differences in market conditions do not last long.

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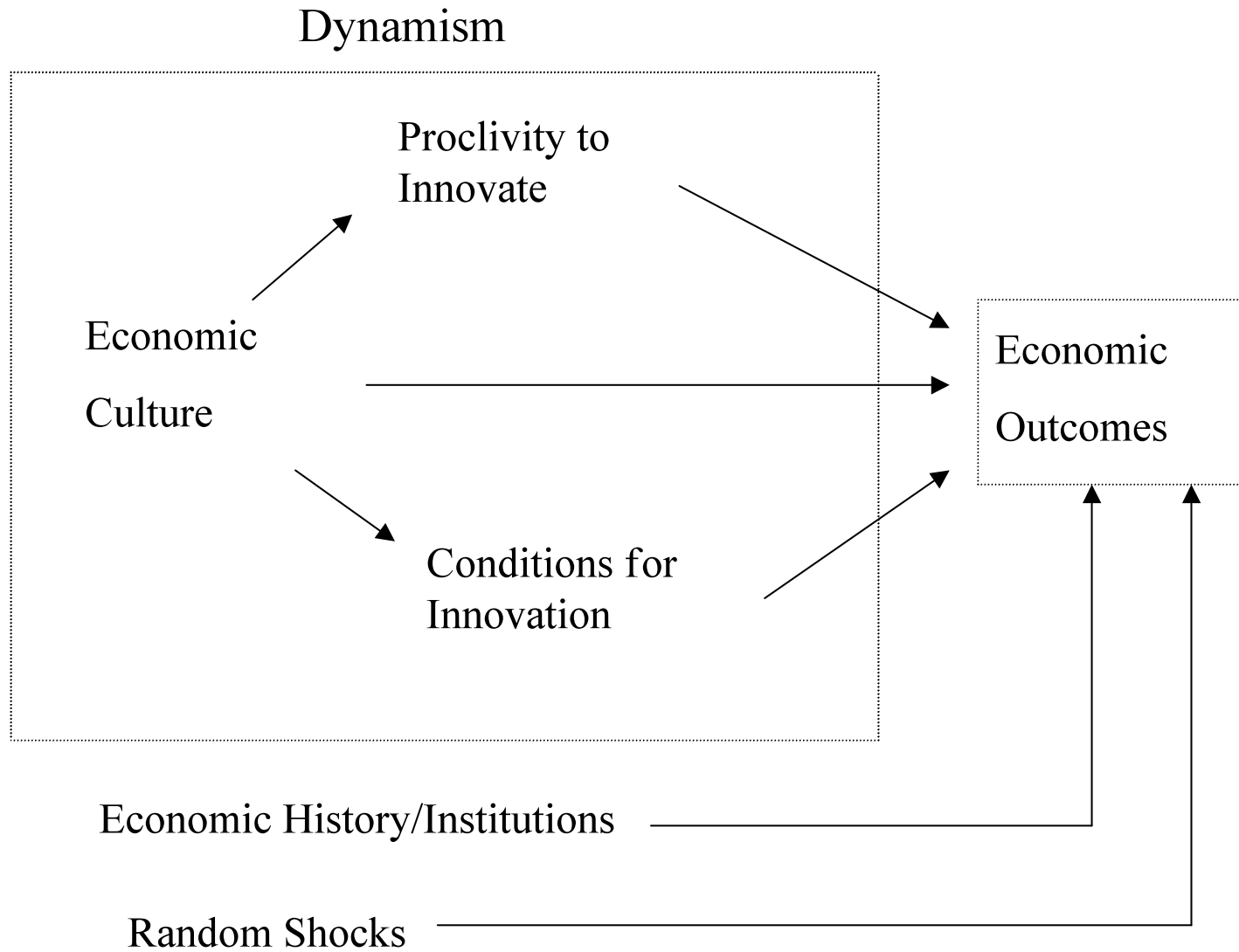


Diagram 1. Dynamism and its effect on economic outcomes

Table 1 Dynamism across the G7 countries: summary statistics

country	vitalism	materialism	Social trust	self-reliance	conditions for innovation	proclivity to innovate
Canada	0.60	0.09	0.36	0.04	0.79	0.34
France	-0.90	0.14	0.27	0.04	0.66	0.31
Germany	0.55	-0.15	-0.54	-0.54	0.69	0.32
Italy	-0.42	-0.43	0.04	0.12	0.41	0.36
Japan	-0.13	-0.67	-0.74	0.23	0.8	0.6
UK	-0.21	-0.16	0.27	0.26	0.84	0.7
US	0.99	0.04	1.34	0.09	0.84	1.22

Table 2: Summary of rotated components and the loadings λ_k of each component k associated with the variables most important for that component

Variable	Description	Vitalism
c016	Important: initiative	0.45
c019	Important: responsible	0.43
c018	Important: achievement	0.39
c021	Important: fulfillment	0.34
c020	Important: interesting	0.32
c014	Important: respectful	0.32

Variable	Description	Consumption-Leisure
c015	Important: hours	0.48
c017	Important: holidays	0.44
c011	Important: pay	0.37
c012	Important: no pressure	0.36
c013	Important: security	0.33

Variable	Description	Social Trust
E075	Confidence: parliament	0.62
E076	Confidence: civil service	0.61
E073	Confidence: unions	0.43

Variable	Description	Independence
a029	Values: independence	0.48
a039	Values: perseverance	0.43
E018	Should: respect authority	-0.32
a042	Values: obedience	-0.48

Variable	Description	Politics
a085	Unpaid Activity: parties	0.68
a068	Activity: Parties	0.66

Variable	Description	Religion
a065	Activity: Religion	0.69
a082	Unpaid Activity: religion	0.69

Variable	Description	Compassion
a064	Activity: Care for elderly	0.70
a081	Unpaid Activity: care for...	0.70

Variable	Description	Culture
a083	Unpaid Activity: culture	0.72
a066	Activity: Culture	0.69

Variable	Description	Good living
A003	Important: leisure	0.59
A002	Important: friends	0.58

Variable	Description	Protectionism
e037	More govmt intervention	0.59
e039	Competition is harmful	0.53
C061	Follow orders	-0.37

Table 3a Indexes of Dynamism and Sources of Dynamism

Country	Capacity for Innovativeness	Proclivity for Innovativeness
Canada	0.79	0.38
France	0.65	0.27
Germany	0.67	0.34
Italy	0.41	0.42
Japan	0.78	0.68
UK	0.84	0.47
US	0.83	1.02

Table 3b Correlation between PCs, conditions and proclivity

Components	Conditions	Proclivity
Vitalism	0.3334	0.2472
Consumption- Leisure	0.4431	-0.1105
Social Capital	0.1392	0.278
Independence Political	-0.1445	0.2095
Activity	0.3804	-0.1533

Table 4 The effect of economic culture, institutions, and dynamism on productivity.

Dependent Variable log(productivity)	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	z
Conditions for innovation	0.402	3.37	-0.138	-1.25	-0.079	-0.43	-0.101	-1	-0.1	-0.36
Proclivity to innovate	0.071	1.02	0.127	2.34	0.004	0.05	-0.088	-1.76	-0.087	-0.56
Vitalism			-0.062	-2.98			0.097	6.12	0.097	1.9
Consumption-Leisure			0.181	6.62			0.18	9.02	0.181	2.94
Social Trust			0.165	6.64			0.312	12.05	0.313	3.88
Independence			-0.008	-0.25			0.05	2.76	0.05	0.85
Politically Active			0.15	3.88			0.254	8.94	0.255	2.75
Employee protection laws					-0.101	-5.33	-0.089	-8.03	-0.089	-2.47
Expected dependency ratio, 2050					0.001	0.1	-0.042	-8.47	-0.042	-2.75
Savings					-4.38E-09	-1.58	2.46E-09	1.57	2.47E-09	2
Social transfers					0.003	0.74	0.017	6.23	0.017	1.92
1996	0.079	1.62	0.079	2.3	0.057	1.49	0.071	3.82	0.072	6.15
1999	0.169	3.47	0.169	4.93	0.138	3.59	0.153	8.17	0.153	13.07
2002	0.21	4.32	0.21	6.13	0.168	4.35	0.19	10.09	0.191	16.02
2005	0.266	5.49	0.266	7.79	0.218	5.61	0.242	12.8	0.243	20.26
Constant	10.301	114.18	10.687	132.31	10.82	34.24	12.713	56.06	12.718	17.51
Observations	90		90		90		90		90	
R ²	0.38		0.67		0.63		0.92		0.92	

Table 5 The effect of economic culture, institutions, and dynamism on the employed population as a ratio to total population, 16 to 64.

Dependent Variable: Activity Rate	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	z
Conditions for innovation	0.319	4.73	0.181	2.93	0.219	3.15	0.038	0.62	0.121	0.81
Proclivity to innovate	0.036	0.92	0.029	0.94	0.224	2.54	0.079	1.01	0.291	2.13
Vitalism			0.078	6.64			0.069	6.76	0.067	2.36
Consumption-Leisure			-0.034	-2.22			0.007	0.44	-0.012	-0.32
Social Trust			-0.014	-1.03			-0.032	-2.11	-4.70E-05	0
Independence			-0.044	-2.53			-0.036	-2.02	-0.067	-1.53
Politically Active			0.056	2.58			0.022	1.12	0.045	0.85
Income Tax					-0.003	-3.6	-0.004	-4.66	-0.001	-2.85
Population, 15-64 years old					-1.04E-09	-2.57	-2.75E-10	-0.75	0	-2.29
1996	0.008	0.29	0.008	0.41	0.013	0.54	0.014	0.84	0.011	1.82
1999	0.025	0.89	0.025	1.28	0.029	1.17	0.029	1.74	0.027	4.64
2002	0.031	1.14	0.031	1.62	0.031	1.26	0.029	1.77	0.032	5.49
2005	0.038	1.4	0.038	1.99	0.038	1.56	0.036	2.19	0.04	6.74
Constant	0.69	13.54	0.776	17.07	0.819	11.45	0.978	15.33	0.817	7.43
Observations	90		90		90		90		90	
R ²	0.25		0.65		0.41		0.75		0.71	

Table 6 The effect of economic culture, institutions, and dynamism on the labor force as a ratio to total population, 16 to 64.

Dependent Variable: Participation Rate	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	z
Conditions for innovation	0.372	5.16	0.375	5.61	0.286	3.83	0.187	3.02	0.284	1.94
Proclivity to innovate	-0.14	-3.34	-0.133	-4.01	0.104	1.1	-0.135	-1.69	0.132	0.89
Vitalism			0.073	5.8			0.065	6.19	0.061	2.21
Consumption-Leisure			-0.045	-2.69			0.008	0.48	-0.014	-0.38
Social Trust			-0.073	-4.78			-0.103	-6.57	-0.063	-1.81
Independence			-0.05	-2.66			-0.032	-1.76	-0.071	-1.63
Politically Active			-0.01	-0.43			-0.055	-2.7	-0.029	-0.57
Income Tax					-0.003	-3.11	-0.005	-6.07	-0.002	-3.62
Population, 15-64 years old					0	-3.03	0	-0.05	0	-2.06
1996	0.008	0.27	0.008	0.39	1.33E-02	0.5	1.60E-02	0.95	1.23E-02	1.64
1999	0.03	1.04	0.03	1.46	0.035	1.32	0.036	2.12	0.034	4.57
2002	0.045	1.53	0.045	2.15	0.045	1.71	0.042	2.47	0.046	6.09
2005	0.051	1.73	0.051	2.43	0.052	1.95	0.047	2.79	0.052	6.89
Constant	0.868	15.93	0.85	17.24	0.971	12.65	1.128	17.37	0.938	8.54
Observations	90		90		90		90		90	
R ²	0.32		0.67		0.46		0.79		0.75	

Appendix 1

The data set includes a number of questions related to general priorities, such as family, leisure, friends (community), or work. These questions are supposed to control for the relative importance of the workplace in life.

- **a001:** importance of family in life on a scale from 1 to 4, 4 being the highest;
 - **a002:** importance of friends in life on a scale from 1 to 4, 4 being the highest;
 - **a003:** importance of leisure in life on a scale from 1 to 4, 4 being the highest;
 - **a005:** importance of work in life on a scale from 1 to 4, 4 being the highest;
- Furthermore, the WVS report a number of variables that represents the values of individuals that they consider worthy of teaching to their children. While alternative interpretations are possible, it seems difficult to make the case that an individual would consider a value or principle worth of being taught to her children that is different from her own. Therefore, this study interprets the following variables as capturing general values, principles, or attitudes that are directly or indirectly related to the workplace.
- **a029:** independence is something that is worth teaching one's children to, yes (1) or no(0);
 - **a030:** hard work is something that is worth teaching one's children to, yes (1) or no(0);
 - **a032:** responsibility is something that is worth teaching one's children to, yes (1) or no(0);
 - **a034:** imagination is something that is worth teaching one's children to, yes (1) or no(0);
 - **a035:** tolerance is something that is worth teaching one's children to, yes (1) or no(0);
 - **a039:** perseverance is something that is worth teaching one's children to, yes (1) or no(0);
 - **a041:** unselfishness is something that is worth teaching one's children to, yes (1) or no(0);
 - **a042:** obedience is something that is worth teaching one's children to, yes (1) or no(0);

One of the greatest virtues of the WVS is that relative to other surveys it provides a plethora of questions directly related to work. These questions and the corresponding data are briefly described below:

- **c001:** in times of job scarcity, preference should be given to men, yes(1) or no(0);
- **c002:** in times of job scarcity, preference should be given to natives, yes(1) or no(0);
- **c011:** pay is important to a job , yes(1) or no(0);
- **c012:** the absence of pressure is important to a job, yes(1) or no(0);
- **c013:** security is important to a job on scale from 1 to 10, yes(1) or no(0);
- **c014:** to be respectable is important to a job, yes(1) or no(0);
- **c015:** the hours are important to a job on scale from 1 to 10, yes(1) or no(0);

- **c016:** to be able to take the initiative is important to a job, yes(1) or no(0);
 - **c017:** holidays are important to a job on scale from 1 to 10, yes(1) or no(0);
 - **c018:** to be able to achieve something is important to a job, yes(1) or no(0);
 - **c019:** it is important for a job to be responsible, yes(1) or no(0);
 - **c020:** to be interesting is important to a job, yes(1) or no(0);
 - **c021:** to be able to fulfill oneself is important to a job, yes(1) or no(0);
 - **c059:** is it fair that more productive workers are paid more, yes(1) or no(0);
 - **c061:** orders should be followed always, yes (1) , no (0);
- Similarly to a001-a005, a number of questions of type E in the WVS capture general preferences about the direction in which the society and the economy in particular should move in the future.
- **e014:** money should be less important in the future, yes (1) or no(0);
 - **e015:** work should be less important in the future, yes (1) or no(0);
 - **e016:** there should be more technological development in the future, yes (1) or no(0);
 - **e018:** there should be more respect for authority in the future, yes (1) or no(0);
 - **e019:** the family should be more important in the future, yes (1) or no(0);
 - **e037:** there should be more government intervention on scale from 1 to 10, 10 being the highest;
 - **e039:** competition is harmful on scale from 1 to 10, 10 being the highest;
- Interestingly, the WVS also contains a large set of questions on activities performed by the interviewees. While these activities may not be directly related to the workplace or anything related to the economy, they may capture the extent to which an individual is outgoing and engages the world. That is, generally high activity in non-economic areas is likely to be positively correlated with the economic counterpart. In this context, some of these variables may also be viewed as potential instruments in a more standard study of economic performance. Here is the list of these variables:
- **a062:** activity, discuss politics; yes(1) or no (0);
 - **a064:** activity, care for the elderly; yes(1) or no (0)
 - **a065:** activity, related to religion; yes(1) or no (0)
 - **a066:** activity, related to art; yes(1) or no (0)
 - **a067:** activity, related to unions; yes(1) or no (0)
 - **a068:** activity, related to parties; yes(1) or no (0)
 - **a070:** activity, related to human rights; yes(1) or no (0)
 - **a072:** activity, related to professional organizations; yes(1) or no (0);
 - **a081:** unpaid activity, care for the elderly; yes(1) or no (0)
 - **a082:** activity, related to religion; yes(1) or no (0)
 - **a083:** activity, related to art; yes(1) or no (0)
 - **a084:** activity, related to unions; yes(1) or no (0)
 - **a085:** activity, related to parties; yes(1) or no (0)
 - **a087:** activity, related to human rights; yes(1) or no (0)

- **a089:** activity, related to professional organizations; yes(1) or no (0)
Finally, a number of questions address the level of social capital:
- **a165:** Can others be trusted, on a scale from 1 to 10, 10 being the highest;
- **e073:** Do you have confidence in the unions, on a scale from 1 to 4, 4 being the highest;
- **e075:** Do you have confidence in the Parliament, on a scale from 1 to 4, 4 being the highest;
- **e076:** Do you have confidence in civil service, on a scale from 1 to 4, 4 being the highest;

Appendix 2

The Kaiser-Guttman Criterion implies that the first 18 factors should be retained. Its interpretation is quite intuitive: since the variance of any variable is normalized to 1, a natural benchmark for the appropriateness of including a factor is that it has variance greater than 1. Gorsuch (1983) and Cattell (1978), however, point out that in the presence of many variables and low common variance, too many factors are extracted. In such cases, they recommend a version of the Scree test. Figure 1 plots the eigenvalues associated with the extracted factors and provides the graphical basis of the test. The largest three eigenvalues, 3.56, 3.02, and 2.23, are followed by a set of eigenvalues that seem to form a linear relation for factors 4 to 6. Then the relation is violated after a drop in the magnitude of the eigenvalue to be established again for the eigenvalues associated with factors 9 to 15. After the 15th factors an obvious linear relation settles in, implying that only the first 15th factors, at best, should be retained.

The relatively low level of the explained total variance, just 53%, raises a major concern. In natural sciences the rule-of-thumb reference value is usually set at 85 to 90%, while in behavioral science around 60%. Thus, the share of the explained variance presented here hovers around the lower bound for the behavioral sciences. This low level is likely due to a number of causes. First, the PCA started with all variance and not only with the common variance. Given the nature of the data, one may expect that there is a lot of idiosyncratic noise. Second, one may be worried about measurement errors. Both imply that more work is needed to investigate the causes of the low level of the explained total variance. Further estimation should be based on versions of CFA or the novel sparse PCA. At any rate, the low level of explained variance suggests that the appropriateness of factor analysis should be questioned by scrutinizing the communalities and the adequacy of the sample. For all variables included in the set, the level of the unexplained variance is below 80%, the standard red-flag reference level, and usually fluctuates in the 20-60% range. The Kaiser-Meyer-Olkin test indicates that the minimum requirements for sample adequacy are met, so factor analysis is appropriate in this respect.

The interpretation of the extracted factors is, however, difficult without any further transformation of the data. A natural question to ask is what are the significant loadings that determine the nature of an extracted factor. For samples larger than 80 observations, significance levels for correlation matrixes suggest that a magnitude of 0.3 under a variance normalization to 1 implies that the loading is significant at the 1% significance level. As a result, almost half of the loadings reported after the initial PCA can be ignored in the interpretation of the results. Yet, the other half still remains...

The PCA reported above provided the direct solution of the problem. Derived solutions are based on the direct solution and their objective is to find the optimal reference system to allow for the interpretation of the extracted factors; they are based on matrix rotation. The criteria for optimal rotation have been stated by Thurstone (1947) and reflect his theory of simple structure that emphasizes that the derived solution should be parsimonious, invariant, unique, and in line with non-factorial findings:

1. Each row of the derived matrix should contain a zero entry, an entry that is not significantly different from zero.
2. If there are n , in the present study 15, factors, then there should be at least n zero loadings in each factor.
3. For each pair of factors, there should be a few variables for which one factor has zero loadings, while the other has non-zero loadings.
4. For any pair of factors, most of the loadings should be zero in both.
5. For any pair of factors, there should be a very small, if any, proportion of the loadings that are common in both factors.

The simplest form of rotation is orthogonal rotation of all factors. Roughly speaking, the objective of such a derived solution is to rotate the “coordinate system” in a way that the original set of factors is transformed, so that for each factor a few loadings have large magnitudes while the rest are close to zero. Key feature of orthogonal rotations is that they still preserve the independence among the extracted factors. As a result, the factors could still be considered, as in the natural sciences, to be a set of independent forces that interact. In contrast, oblique rotations allow for the violation of the orthogonality of the factors in order to obtain more meaningful interpretations. Under oblique rotation, the set of reference vectors and the set of factor vectors are not identical, which gives rise to two possible approaches to the analysis of the derived solution. One approach states that the interpretation should focus on the factor patterns represented by the loadings, while the other states that the interpretation should focus on the correlation structure. Thus, the analysis of derived solutions based on oblique rotations may be quite involved. Fortunately, in the context of the present study, there appear to be few differences in the two derived solutions, so the discussion will focus on the one obtained through orthogonal rotation.