



## **PRESS RELEASE OF WORKING PAPER 5.15**

### **TRUST AND INNOVATION IN EUROPE: CAUSAL, SPATIAL AND NON-LINEAR FORCES**

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#### **OBJECTIVE**

There is an extensive literature on the impact of social capital on outcome variables. Social capital and trust have been associated with economic growth, innovation, education, value creation by firms and crime. In this research our objective is specifically to look at whether (i) there is a causal relationship between trust and innovation, (ii) other forms of trust (e.g., general, personal etc.) are conducive to innovation, (iii) non-linearity of trust is a factor to consider, and (iv) spatial forces are important in the relation between trust and innovation. These issues have been tackled individually in the literature previously. However, this is the first research that takes all these issues as a package. We also provide a survey regarding the policy implications that drive from the empirical literature specific to cross-country or regional regressions that use social capital and/or trust as independent and economic growth and/or innovation as dependent variable.

#### **MAIN RESULTS AND POLICY IMPLICATIONS**

This research investigates recent issues regarding the social capital / trust and innovation link. We specifically focus on three forces that could affect the trust-innovation link: causality, non-linearity and spatiality. The roles of these forces have been investigated by using data from 135 EU regions. Our data come from two main sources. Most of the innovation related data comes from eurostat. Trust related data is from the European Social Survey 2004 round. We specifically used the 2004 round because there are questions on generalised trust and detailed questions on self experiences and own acts regarding trust and trustworthiness.

The findings show that trust is an important determinant of innovation measured by patent applications per million inhabitants. Of all other 21 trust related indicators from the ESS we showed that the only two robust indicators are generalised trust (TRUST) and whether most people are fair (FAIR). This result is a strong finding regarding the robustness of the general trust question used in various surveys like the ESS or European Values Survey. After we set up a link between trust and innovation we looked at some issues in a more detailed way. First, we dealt with causality issue using historical state of universities in European regions and estimated regressions using an instrumental variable approach (IV). The IV approach is commonly used in the literature to address causality issue between social capital/trust and outcome variables such as innovation and economic growth. Our findings show that with IV estimation we can capture the exogenous general trust element and show that trust is conducive to innovation.

Second, we look at non-linearity. It could be the case that at very high trust levels the trust-innovation link breaks down or even turns into negative. For instance closed networks or family networks have very high social capital but generally prove to be bad for personal outcomes. To investigate the existence of such forces we included squared terms of TRUST and FAIR into the regression. The squared terms turn out to be negative but not significant. While we report signs of non-linearity we cannot report statistically significant findings. Third, we investigate the impact of spatial forces. It could be the case that just as R&D, innovation and human capital of neighbouring regions could have effects on regional factors, trust of the surrounding regions could affect regional outcomes. Our estimates using spatial lag models confirm previous studies that spatiality is an important force. In general we find that a one standard deviation rise in general trust (a 12.5% rise in trust level) increases patents per million inhabitants on average by 2%.

Our policy implications are indirect. Social capital and trust play an important role in explaining innovative activities across regions. Policy should focus on the complementary effects. Fostering networking between as well as within regions is key to benefit from spatial forces. Education has a great socialising impact within and between regions. Regions could enhance their social capital in the long run by just designing a good education system that is based on learning to learn new skills.