Trust as a Determinant of European Trade

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**Abstract**

By analyzing bilateral trust on trade and financial exchange within Europe, I examine how trust might increase trade and a lack of trust could lead to a significant home bias in European countries. The resultant exporation into the subject determines that trust has no tangible impact on trade, and that correlations between the two are spurious at best. Other factors, such as religious similarity, distance between nations, and size of nations have far more impact on trade and crowd out the impact of trust to such an extent that trust’s impact on trade and foreign direct investment is not significantly different from zero. My findings indicate that some other factor, such as information or education, potentially has supplanted trust as a key determinant in trade.

**Introduction**

Although trade has been nearly completely liberalized in the European over the last decade, there is still a considerable and poorly understood home bias within European countries, intra-continental trade in Europe is not where it would be if trade were perfectly efficient. Obviously, some amount of trade should remain local (Obstfeld and Rogoff, 2000), partially due to physical distance between countries, but the geography of countries does not fully explain this home bias. While many authors have analyzed the extent of home biases, this paper will focus more on determinants of home bias, addressing the theory that trust, both nationalized trust and bilateral trust, is a significant determinant in trade. Other explanations include transaction costs, asymmetric information, or exchange rate volatility, but I will take the cultural approach in looking at exchange disparities. This paper will address multiple types of trust, including country-specific and bilateral measures of trust, and analyze its impact on bilateral trade statistics, foreign direct investment, total trade as a percent of GDP, and GDP per capita. Bilateral trade numbers provide the most direct measure of a country’s international openness, but foreign direct investment, which is usually made by more educated and analytic mutual fund managers and other investment professionals, may show the impact of trust on financial exchange even amidst a highly erudite, professional group of people. This paper is organized into five further chapters. Chapter 2 shows the prior work in this field, which shows a few differing conclusions and headlined by Guiso, Sapienza, and Zingales’ work, “Cultural Biases in Economic Exchange.” Chapter 3 describes the data used in this project, which combines various questions from the World Values Survey and Eurobarometer, as well as OECD economic data, using a set of Python scripts. Chapter four focuses on the methodology to run my series of regressions in Stata, starting with OLS regressions and progressively becoming more complex with controls and instrumental variables. Following the regression techniques, chapter five will discuss the results and give theoretical justification for them. Finally, chapter six will summarize the results and determine if trust actually has a causal impact on trade, as well as giving possibilities for future research.

**Chapter 2: Related Research**

The primary work which inspired me to write this paper was Guiso, Sapienza, and Zingales’ work “Cultural Biases in Economic Exchange” (GSZ 2008), which discusses extensively trust and its effects on trade. I have decided to take another look on this subject for a variety of reasons. First, its data is old. Most of their financial data comes from 1996 or prior, and all of their trust data comes from 1996. In revisiting this subject, much has changed in the structure, openness, and perceptions of countries within Europe. Unfortunately, data for bilateral trust is still limited to the 1996 World Values Survey that GSZ used, but current survey data on intra-country trust levels has a relatively high correlation with the 1996 values. As such, I’ll use both in my analyses as a robustness check. Furthermore, trade statistics have likely changed dramatically since 1996. Europe has become more liberalized in terms of trade, more integrated in terms of geo-political issues, and more harmonized with the advent of the Euro. I believe that, as a result, current trade levels will greatly differ from those before the current level of European integration. Finally, I think 2013 data will be highly representative of “standard” economic conditions, as it is post-crisis and a moderate way through the recovery—neither too bullish or too bearish, but a healthy medium that should be representative of average economic conditions. I read numerous other works related to trust as a whole—the impact of trust on families by Alesina and Giuliano (Family Ties, 2014), GSZ’s 2008 paper on trust’s impact on the stock market. Most of these refer to microeconomic outcomes for individuals, but a lot of their theoretical justifications can be generalized to the firm and country level.

**Chapter 3: Data**

Data has consistently been difficult to find. The key question for running this analysis—“How likely are you to trust someone from country x”—is no longer present in the Eurobarometer and has not been present since 1996. Since then, there have been no good measures of bilateral trust between individuals of certain countries. This data probably is still representative of Europe, but, unfortunately, it is missing many country specific values. As a more modern proxy for trust, I’ve taken various questions referencing “trust” from the 2009 World Values Survey, including: “would you say that most people can be trusted or that you need to be very careful in dealing with people,” “how much do you trust your family,” “how much do you trust your neighborhood,” “how much do you trust people you know personally,” and “how much do you trust people of another nationality.” Because of data sparseness, I choose to use these measures in addition to the bilateral trust data. I believe that these will show dramatically different results than the bilateral trust data—in fact, I think that all of the questions except “how much do you trust people of another nationality” will have strongly negative coefficients on trade, based on high levels of personal trust leading to low levels of generalized trust (Alesina and Giuliano 2013). Additionally, I used a 2006 Eurobarometer special report to measure the percent of Europeans in each country who spoke English well. This data will serve as a valuable control my data because I believe that rates of English speaking—indicative of a country’s educational attainment and general exposure to world business, as English is the de facto official language of business for worldwide commerce—will also have a strong correlation with trade.

For my economic data, I use GDP data from the World Bank and trade data, including FDI and exports and imports, from the OECD. Both of these sources should be highly accurate and not prone to errors. To properly merge and format this data, I’ve imported it into a Python script that parses it and formats it into a manner that’s easily used by Stata in my regressions. While any code is susceptible to errors, I am confident in my data-management skills and do not believe that coding this data in Python could adversely affect my results.

In addition to my Python data manipulation, I build matrices for distance between capital cities, common legal origin, and religious similarity. The decision to use capital cities instead of economic centers was twofold—in almost all cases, the capital city is the largest city in each European country, and capital cities always represent a political center if not an economic center. While being the largest city does not necessarily mean it is an economic center, e.g. Frankfurt or Munich compared to Berlin in Germany or Northern Italy versus Rome, but population size is a good proxy for economic output, and analyzing output between cities in comparison with population sizes is too tedious of a task for this paper. To create this joint distance system, I manually take distances for every combination of capital city in Europe and import them into my Python data frame. For common legal origin, I divide each country into one of four categories—English (Common Law), French, Scandinavian, or German—and give a country a dummy variable of 0 or 1 whether or not they share legal origin with another given country. Although some countries blend legal traditions, such as Italy mixing together some elements of both the Napoleonic Code and German Law, common legal origins, in theory, should increase trust between states. The last control variable, religious similarity, is definitively the most difficult to retrieve data on. Because of no preexisting data sets on it, I take the fraction of each country’s religious denomination—or at least the five or six biggest denominations—multiplying them by every other country’s percentage of the same denomination to create a similarity index for each religion and each country. I then add the results for every different religion in each bilateral country pair to create the similarity index. In essence, I take the product of the fraction of people in country x and country y who have religion z and then add across all religions z (which represent Catholicism, Protestantism, Judaism, Islam, Orthodox, no religion, and Buddhism). Also presumably, people with higher religious similarities will exhibit more trust for people, but should not have an impact on international trade, which is done mostly on the firm level.

I then output my final data frame as a CSV into Stata. The final output of data sends the total value of a country’s bilateral imports and exports, the trust measures listed above, which I normalized on a scale from zero to one, each country’s total gdp, trade as a percent of GDP, rate of citizens (reporter, partner, and the product of the two) proficient in English, net FDI—both raw and as a percent of GDP—portfolio equity net inflows, partner GDP, distance between capital cities, common law origins, and religious similarity.

Once in Stata, I have a few more data manipulations that I want to perform. I take the log of all of the stock variables—total exports and imports, GDP, total exports, total imports, and FDI. I think these variables are otherwise highly skewed and would give heteroskedastic results in the following regressions, so a log transformation gives them a stronger correlative power. Finally, because I currently only have bilateral trade data between countries, I group trade by country and generalize a country’s statistics. I do this for two reasons: first, I want to see if country-specific, not bilateral, trust information has any correlation with overall trade in a country, i.e. do people more trusting of foreign people in general have enough trust in other nationalities to tangibly impact trade. Theoretically, people more willing to trust other nationalities would be more inclined to engage in international trade and investment, but without reciprocal trust—the trust shown in the bilateral data—it may be difficult to establish these relations in a generalized manner. The second reason for creating a variable for trade in entire countries is to provide trade variables that can help me create a European gravity model, which can get rid of many exogeneity issues. As a result of this effort, this data should be about as pure as it can be, given how sparse and loosely formatted the surveys consistently are created.

**Chapter 4: Methodology**

Now that my data is in Stata, I start running regressions to either establish correlation—and if so, work towards finding causality—or to disprove the idea that trust has an impact on trade. To get a general grasp on the data, I first run a series of OLS regressions, starting at the most basic models:

LogTradesi(overall, imports, and exports) = αi + β1i\*Trust(of all variations) + β2i\*LogGDP +εi  **(Eq. 1)**

Tradei(%ofGDP) = αi + β1i\*Trust(of all variations) +εi **(Eq. 2)**

This basic specification, run on the course of the trust variables and using various trade measures as the dependent variable, gives some general insight into what can be expected over the course of the data. However, this specification is greatly limited. It suffers from extensive omitted variable bias and is not representative of an actual chain of causality. Similarly, I run the same regressions against Net FDI and Net FDI as a % of GDP. I expect somewhat similar results as before, but the FDI measure is essentially a robustness check.

My first main updated specification regresses the same system as equation one, but it adds a selection of controls into the system in addition to the log of GDP: English rate, law origins, religious similarity, and log of distance. I believe that all of these are omitted variables that can capture determinants of trade better than trust and GDP alone. I believe that English rate can affect trade through two channels: directly by increasing education and lowering the cost of transactions—as English is the world language of business—and also through trust because understanding people is key to trusting them. I think that English rate primarily affects trade through the trust channel and less through education, which makes it an effective instrument later on, which I will discuss. Common origin of law should increase trade due to providing more trade guarantees, lowering transaction costs, and lowering levels of information asymmetry. Religious similarity at first glance seems as if it should not affect trade—why should common religion increase trade when secular firms control trade—yet I find that religion has a strong impact on trade. My theoretical guess for this apparent discrepancy is that religious commonality historically leads to similar institutions that make it easier to trade between countries. Finally, the log of distance obviously should be analyzed in flows of trade—trade decreases as distance between capital cities increases. The distance between capital cities also leads me to my next specification: the gravity model.

Gravity models are frequently used to models financial flows, immigration flows, and basically anything in economics that depends on distance. The specification for my gravity model starts off as the standard model with bilateral trust added as an additional regressor: 

If bilateral trust is still significant, I will add back my controls into the gravity model, but currently I will undergo the gravity model with three different bilateral dependent variables, total trade, imports, and exports. The gravity model captures both the size of the importing and exporting countries and adjusts for the log of distance between nations.

The final regression specification that I’ll run will be a two stage least squares estimate, both with the basic regressions and with the control vector of legal origin, and religious similarity added to it. Originally, I planned on using religious similarity as my instrument, as I assumed religious similarity to be exogenous to trade but highly correlated with trust. In testing the exogeneity of religious similarity, I found that it had a highly significant correlation with trade, even under a variety of controls. This effect is probably due to the institutions argument I proffered before, but it requires me to determine a new instrument. As such, I attempted to use reporting mutual English-speaking rates as an instrument in the hopes that English rates only affect trade through increasing trust. Unfortunately, it seems as if this instrument is also invalid, and, in fact, has a much higher impact on trade than bilateral trust, which indicates that trade increases more from the ability to speak the common language itself instead of the interpersonal trust. After my two instrument choices fail, I do not have any other instruments readily available, but this is not a huge issue, as instead of proving causality for my explanatory variable, trust, I believe that I am creating doubt upon the impact of bilateral trust on trade.

**Chapter 5: Results**

The standard OLS regressions, straight from the beginning, give some surprising results. First, the log of total trade regressed against the trust people have towards other people in general has a negative coefficient, but is only statistically significant at the 10% level, even controlling for the log of GDP. Given the principles of amoral familism, which stipulate that people trust people intimately close with them—family and neighbors, basically—the correlation between neighborly trust and trade makes sense, which is neighborhood trust is more negatively correlated with the log of trade and is significant at the 1% level when correcting for the log of GDP (Figure 1). This does not surprise me, as groups with stronger family ties are more isolated than those with weaker ties, and, in fact, it leads you to suspect that trust in family is even more strongly negatively correlated with the log of trade. When the same regression is done against trade as a percent of GDP (Figure 2), the sign remains the same, but neighborly trust loses significance. However, fittingly, family trust levels in both basic regressions are strongly negative and statistically significant at the 1% level. Similarly regressions between trade and trust between people “you know personally” show significant negative coefficients. All of these initial results point to indications that stronger bonds between close family and friends limit productivity and stifle international exchange. My first surprising, and quite interesting, result comes from the question, “How much do you trust people of another nationality.” At first glance, the intuitive thought is that this measure would increase trade, right? If someone trusts people from another nationality more, then that person should be more likely to trade with other nations, but the results don’t support this conclusion. Both regression results give strongly negative correlation to this question in relation to trade. Obviously, this is a simplistic regression, and there almost assuredly are omitted variables causing biases as well as extensively missing data due to the World Values Survey incompletely addressing nations, but I cannot think of any solid theoretical background as to why this might be the case. The only argument that is somewhat supported in the literature is that diverse countries generally have less economic growth than homogenous countries, and there may be some link there between trade growth as well (. Regardless, the last simplistic regression that I run is the log of total trade value against bilateral trust, and it gives me what I’m expecting—a statistically significant positive coefficient at the 5% level. This coefficient holds 5% significance against controls for the log of GDP, and the country’s English rate, indicating that some of the most obvious omitted variables do not affect its impact.

Next, I analyze the impact of the various trust measures on foreign direct investment in a similar manner. As we see in Figure 3, the results are substantially the same between trade in goods and flows of investment, albeit slightly lower in significance for the FDI statistics. This is precisely what I expected—FDI likely represents less information asymmetry with financial professionals focusing more on due diligence and breaking into unknown markets, as well as finance professionals generally being less risk-averse than business managers.

Moving on from simplistic regressions, I add a series of controls to my baseline ordinary least squares regression, including English rates, legal origin, religious similarities, and the log of distance—the results are shown in figure 4 in the appendix. The first additional variable, the product of the English rates spoken by the importing and the exporting countries, i.e. the mutual rate of English-proficiency, removes all significance in bilateral trust. This is pretty surprising, and it indicates that English-proficiency and trust are highly correlated. However, this result theoretically makes a lot of sense. As English rates increase, trust should also increase due to the increased ease in communicating during transactions. What is surprising about this result is how much mutual English rates reduce the significance of trust, indicating that English knowledge is a much better predictor of trade than trust. When I add common legal origin to the regression, significance for bilateral trust comes back, but only at the 10% significance level. When legal origin is present, all of the coefficients increase except for the log of GDP, indicating that common legal origin would, oddly enough, have a negative impact on trust. I have no reasonable explanation for this result, and other literature indicates that this should have a positive coefficient (GSZ Cultural Biases…). There’s a remote possibility that I categorized some countries’ legal origins incorrectly, as I could not find a definitive list and had to use a fair amount of subjectivity in my assessment. Regardless, the impact it has is not large compared to other variables, so I am not too concerned. Adding religious similarity changes none of the results significantly, but at this point it is interesting to note that every coefficient is statistically significant at the 1% level except for bilateral trust. Given the strength of every other predictor, bilateral trust begins to look progressively less accurate as a causal determinant of trade. Furthermore, when I insert the log of distance into the regression, every other coefficient stays significant at the .1 percent level except for legal origin and bilateral trust. Legal origin drops to being significant at the five percent level, probably because there is some correlation between legal origins of nearby countries—hence, the impact of distance on its coefficient. More importantly, bilateral trust not only loses significance, but its coefficient also turns negative! If it served as a predictor for trade before, it lost a significant almost all of its predictive power when distance is added to the equation. The impact of distance is profound, so the next regression that I will perform is a gravity equation, with and without controls.

The gravity equation for trade is exactly how it sounds; it relates trade to the size of both partners as well as the distance between them, just like the scientific equation of gravity. Figure 5 shows the results of the gravity equation for total trade, exports, and imports, while figure 6 shows the gravity equation with mutual English rates, common legal origin, and religious similarity included in the model. From figure 5, it’s obvious that there is basically no difference between running the regression on total trade, exports, and imports. All variables are significant at the .1 percent level except for bilateral trust, which hovers somewhere around zero, highly insignificant. This result lends more credence to the belief that trust does not act as a determinant to trade. Looking at the scatter plots (Graphs 1-4, with the log of trade value on the y-axis), the relationships between distance, domestic GDP, and foreign GDP are far more striking than the bilateral trust numbers. Figure 6 further reinforces this belief, with every variable but bilateral trust and mutual English significant at the .1 percent level. Mutual English losing significance is a really interesting result in this regression, considering it was at the .1 percent significance level in nearly the exact regression before partner GDP was included. My interpretation is mutual English rates served as a proxy for educational attainment, and, obviously, educational attainment is much higher on average in wealthy countries. As such, having both a wealthy reporting country and partner country includes the each educational level within their results, so mutual English rates end up nullified. As far as bilateral trust goes, these results add weight against its causality towards affecting trade. As a last potential test, I attempt to run a two-stage least squares regression to test various instruments and how they impact trade through the trust channel.

Going into this paper, I assumed that religious similarity would act as an effective instrument for evaluating the causal impact of trust on trade and controlling for the potential reverse causality of trade impacting trust; however, religious similarity is not exogenous to trade at all. As seen in figure 7, religious similarity serves as more of a predictor than bilateral trust on trade. This is a surprising result, as one would not normally expect common religions to have an impact on the firm level. One potential channel of causation could be through historical institution development. Nations with similar religions could have created similar institutions and rule of law that could work more cooperatively with each other, increasing the possibility of trade between nations. If I had an institution similarity index from the late 1800s, I could determine a causal chain through this variable, but currently I must deal with this limitation. Because of the failure of this variable to serve as an instrument, I attempted to use English rates as an instrument. I knew this would be a much weaker instrument, but I did not realize how endogenous this variable was to my system of equations. When I added English rates to the regression, it instantly eliminated bilateral trust’s significance and was itself statistically significant at the .1 percent level. Its correlation with the dependent variable was eminently apparent and instantly rejected its use as an instrumental variable. On account of no variables being highly uncorrelated with trade, coupled with the fact that there is a small chance that trust and trade are even related—evidently making testing for reverse causality entirely unnecessary—I choose not to pursue another means of instrumenting for trust in this regression. Generally, the lack of relationship between trust and trade is strongly supported by the data, so I fail to reject the null hypothesis that trust has no impact on trade.

As shown, these results hold under a variety of circumstances, but there are definitely some limitations to my findings. First, the data provided by the World Values Survey and European Values Survey are highly incomplete. For such extensive studies, a complete data set should exist, but because of regional differences of the WVS and the reliance on humans to collect and record the data, a lot of results are incomplete. Two more controls also leave me wanting more in the regressions themselves, common borders, genetic distance, information flow, and a full language similarity index. Common borders, as they would presumably increase trade, could offset much of the decrease in trade indicated by the distance between capital cities. An extension of that idea would be a mapping of each country’s economic centroid, which could serve as a much better estimate than capital cities for bilateral distances, but that data would require extensive research and somewhat complicated math. Genetic distance is another measure included in a lot of literature in cultural economics. It could serve as an effective instrumental variable, but I would still question its efficacy because of its collinearity with geographic distance. Information flow, represented by foreign newspaper circulation in countries, is another variable commonly used in this field. I did not use it for two reasons, one being its high correlation with both GDP and English rate (educational attainment and literacy), and the other being a substantial correlation with geographic distance. For example, a lot of Austrians might subscribe to Munich’s SZ, but I highly doubt that many Spanish people read that newspaper. To add, a full language similarity index would help for a few reasons. First, although a lot of business is in English, significant business is conducted in local languages, so overall similarity, similar to what I did for religious similarity, would be a much more accurate measure. Furthermore, it could reduce the impact of geographic distance because languages are clustered in similar geographic regions, so the gravity model would be made more accurate. Finally, I think differentiating between different types of exports may show different results, i.e. trust has a much higher impact on highly differentiated goods, but I did not have time to investigate into this. Nevertheless, I think my scope of variables is adequate and provides enough information to mostly dismiss the impact of trust on trade.

**Conclusion**

In making sweeping claims about how trust may affect trade, one must exercise great caution in three things: what type of trust, what type of trade, and establishing causality. While not the topic of this paper, preliminary indications lend credence to the belief that high levels of interpersonal trust instead of generalized trust work towards stifling trade, and—in the extreme cases—devolve into amoral familism (Banfield 1958, GSZ 2004). Additionally, although not investigated fully and not entirely significant, higher levels of exchange in more technical, information-heavy sectors—finance and investment—are less dependent on trust. Those tangential, yet important, findings aside, I would like to address the major discrepancies between this paper and GSZ’s work on such a similar topic. I believe that the biggest difference is the opening up of Europe, the common currency, and more trade protections. On account of these things, I believe that trust does not matter as much in economic exchange within Europe for a host of reasons. Primarily, the trade protections offered by the EU lower the risk premium in goods trade, so organizations have more information and protection from the EU—relying on trust in the systems rather than in individual countries to perform trade. In GSZ’s paper in 2008 on trust and stock market participation, they saw a large effect of trust on stock market participation, but when education was included in this regression, the impact of trust was drastically reduced. This effect, I believe, is a widespread, macroeconomic impact of the substitution effect of information on trust. As markets become more open and protected, information could replace trust as a significant determinant of trade. As my findings, in a more recent and open market, somewhat heavily dismiss the impact of trust on trade, this explanation seems like a possible resolution to seemingly irreconcilable results. More research is definitely needed in the field, and better variables are necessary to address three things to properly establish causation: openness of markets, protection of markets, and information within markets. With accurate measures of these three things, further relationships may be discovered. However, as it stands now, trust has no discernible bearing on trade, and I can safely conclude that my initial hypothesis is incorrect.

**Bibliography**

Alesina, A. and P. Giuliano. 2014. “Family Ties.” In *Handbook of Economic Growth*, edited by Philippe Aghion and Steven N Durlauf, 2A:177-215. The Netherlands: North Holland.

Alesina, A. and E. La Ferrara (2005) "Ethnic Diversity and Economic Performance." *Journal of Economic Literature*, 43(3): 762-800.

Banfield, E., *The Moral Basis of a Backward Society*, (New York, NY: Free Press, 1958).

Easterly, W. and R. Levine (1997) “Africa’s Growth Tragedy: Policies and Ethnic Divisions,” *Quarterly Journal of Economics* 112 (4): 1203-1250.

Guiso, L., P. Sapienza, and L. Zingales, (2004) “*U*Cultural Biases in Economic Exchange*U*”, NBER Working Paper No. 11005.

Guiso, L., P. Sapienza and L. Zingales (2004),“*U*The Role of Social Capital in Financial Development*U*,” *American Economic Review,* Vol. 94, No. 3, 526-556.

Guiso, L., P. Sapienza and L. Zingales (2008) “*U*Trusting the stock market*U*”, *Journal of Finance*, 63 (6) 2557-2600.

Obstfeld, Maurice, and Kenneth Rogoff. "The Six Major Puzzles In International Macroeconomics: Is There A Common Cause?." *NBER/Macroeconomics Annual (MIT Press)* 15.1 (2000): 339-390. *Business Source Complete*. Web. 11 Dec. 2015.

**Appendix**

Figure 1:

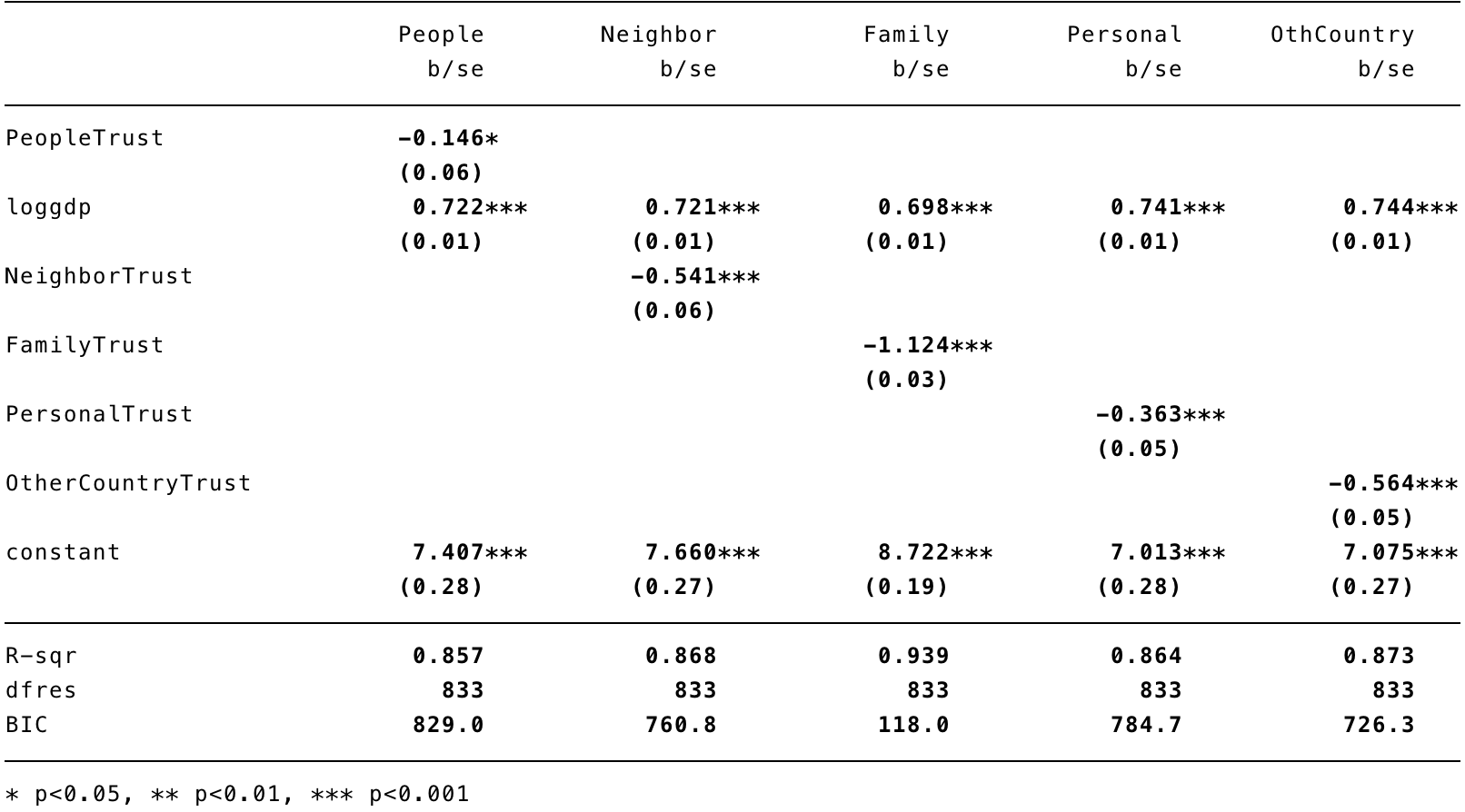


Figure 2:

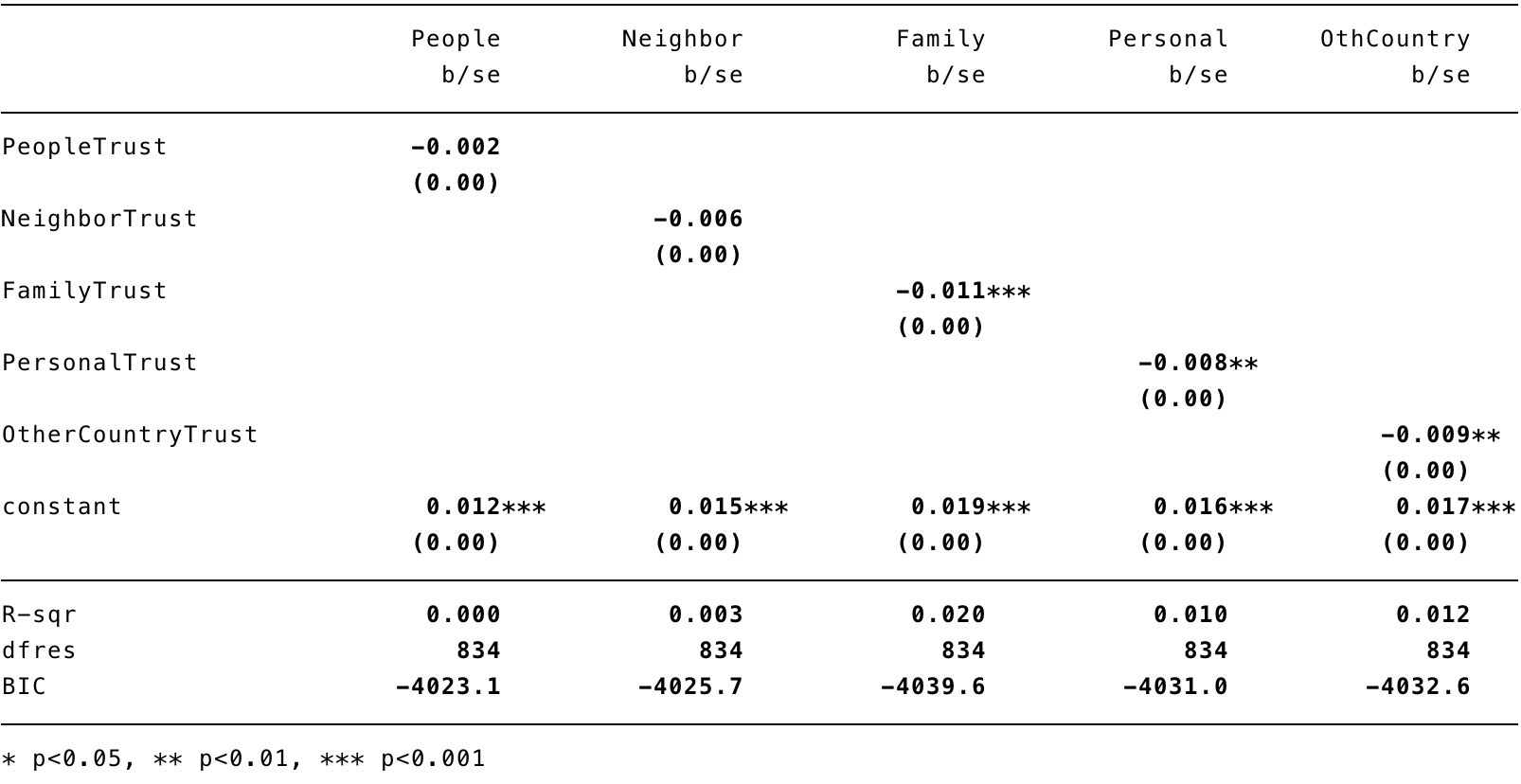


Figure 3:

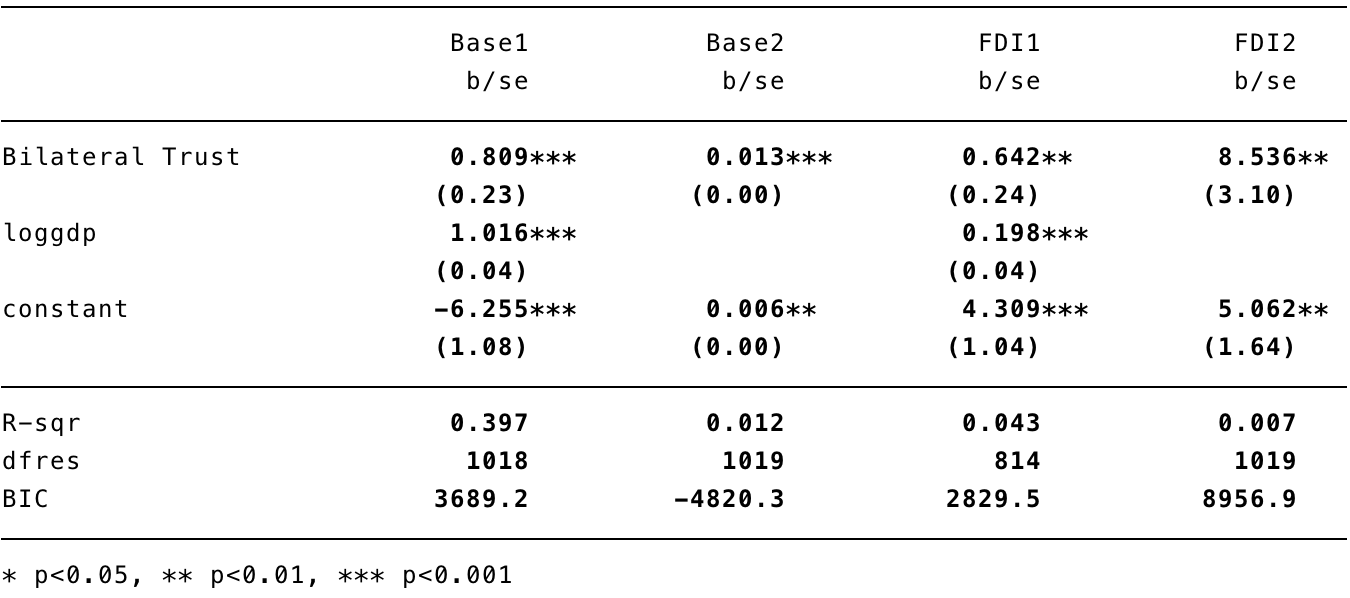


Figure 4:

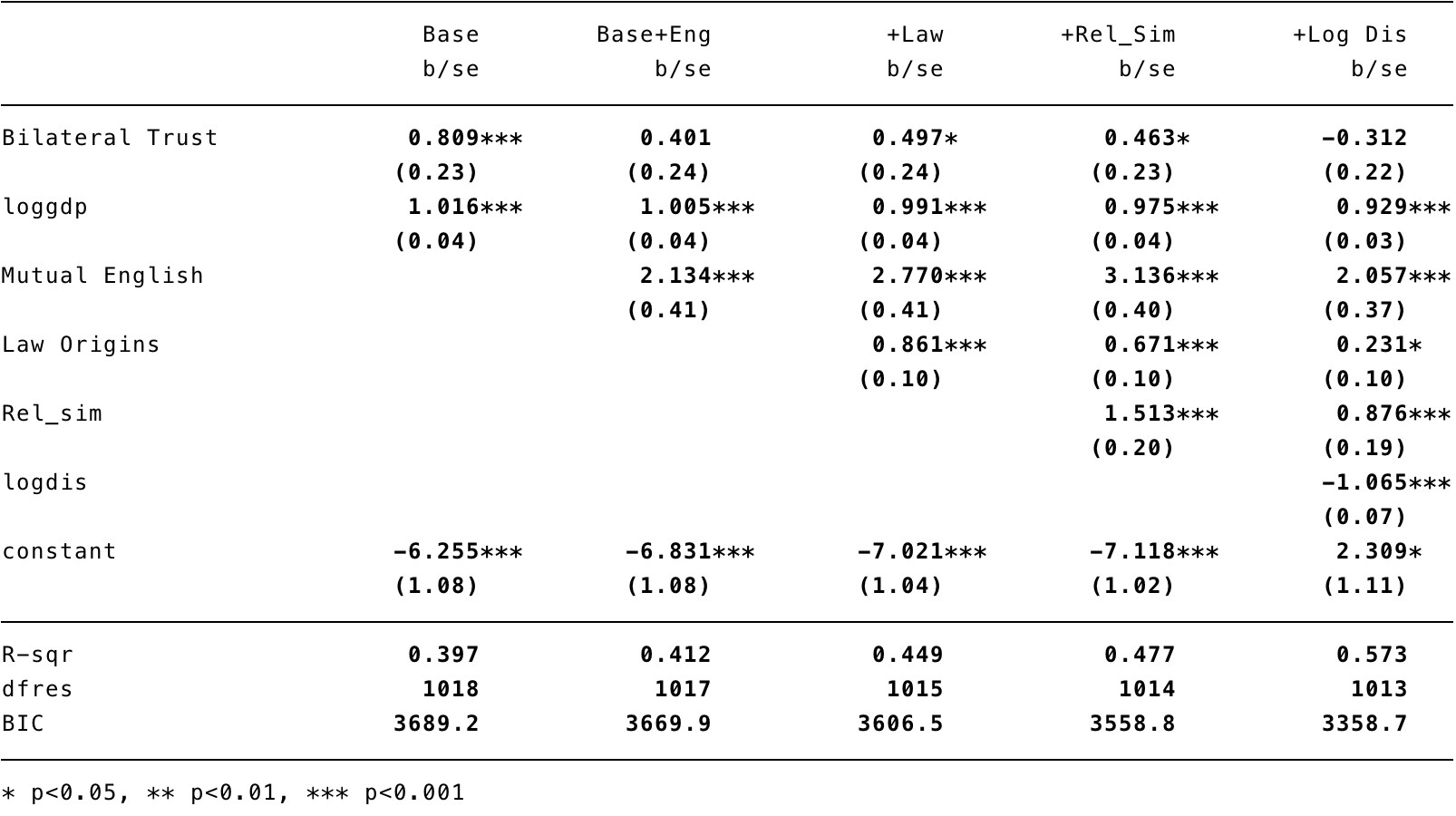
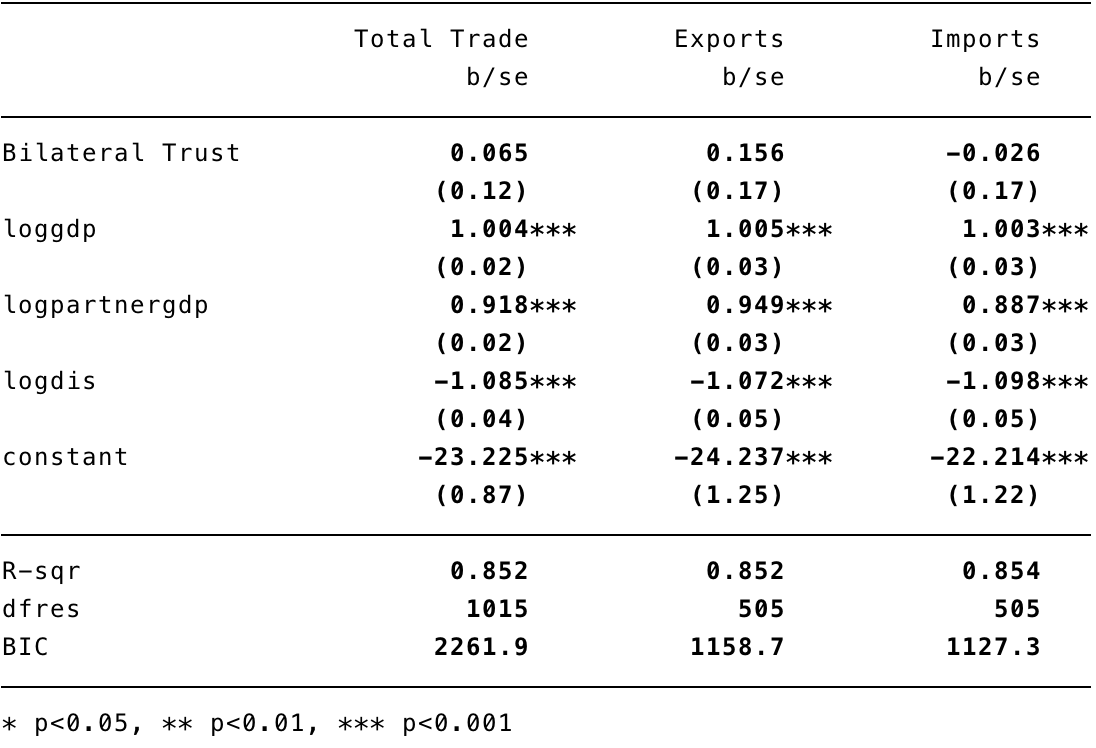
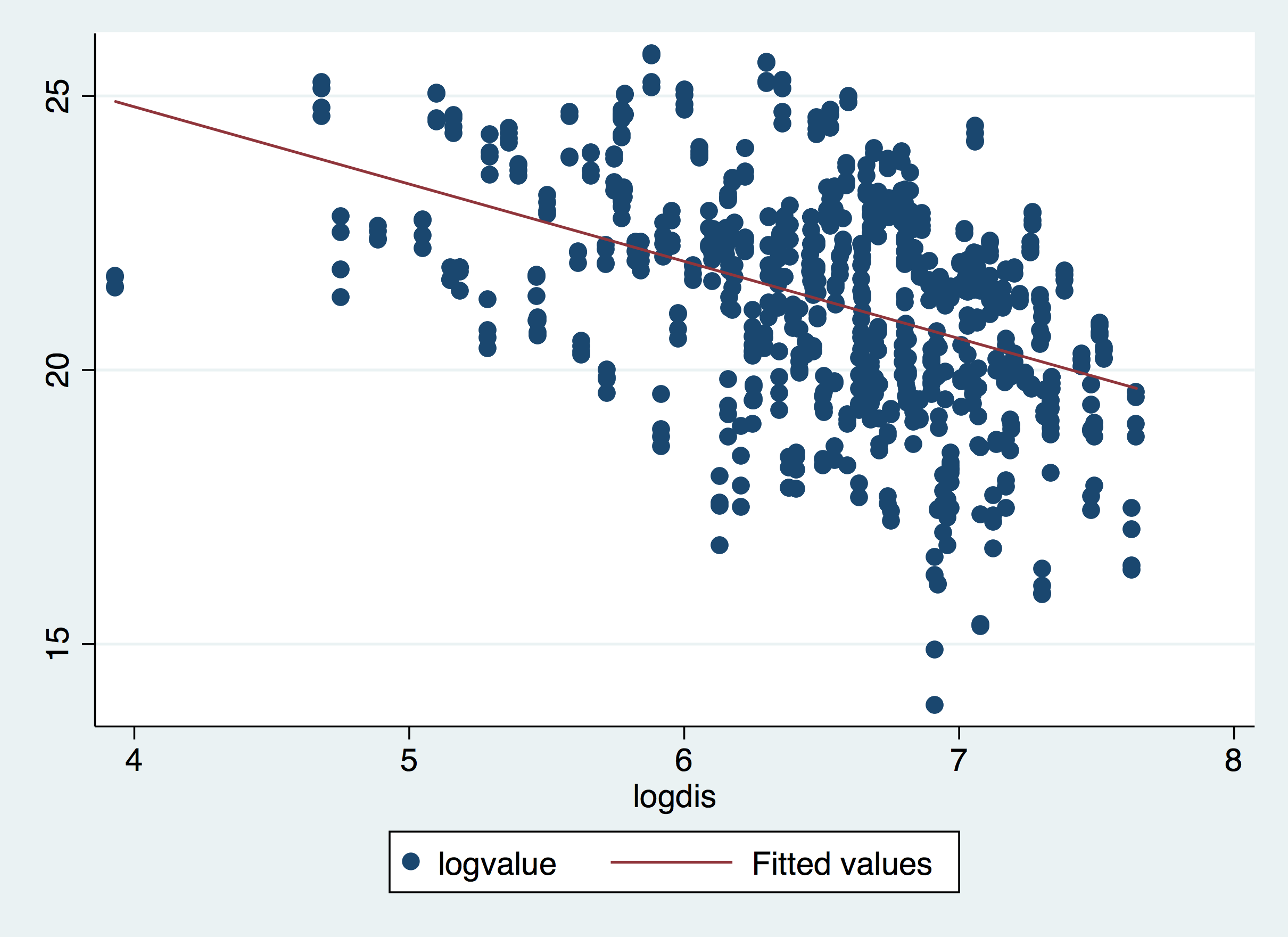
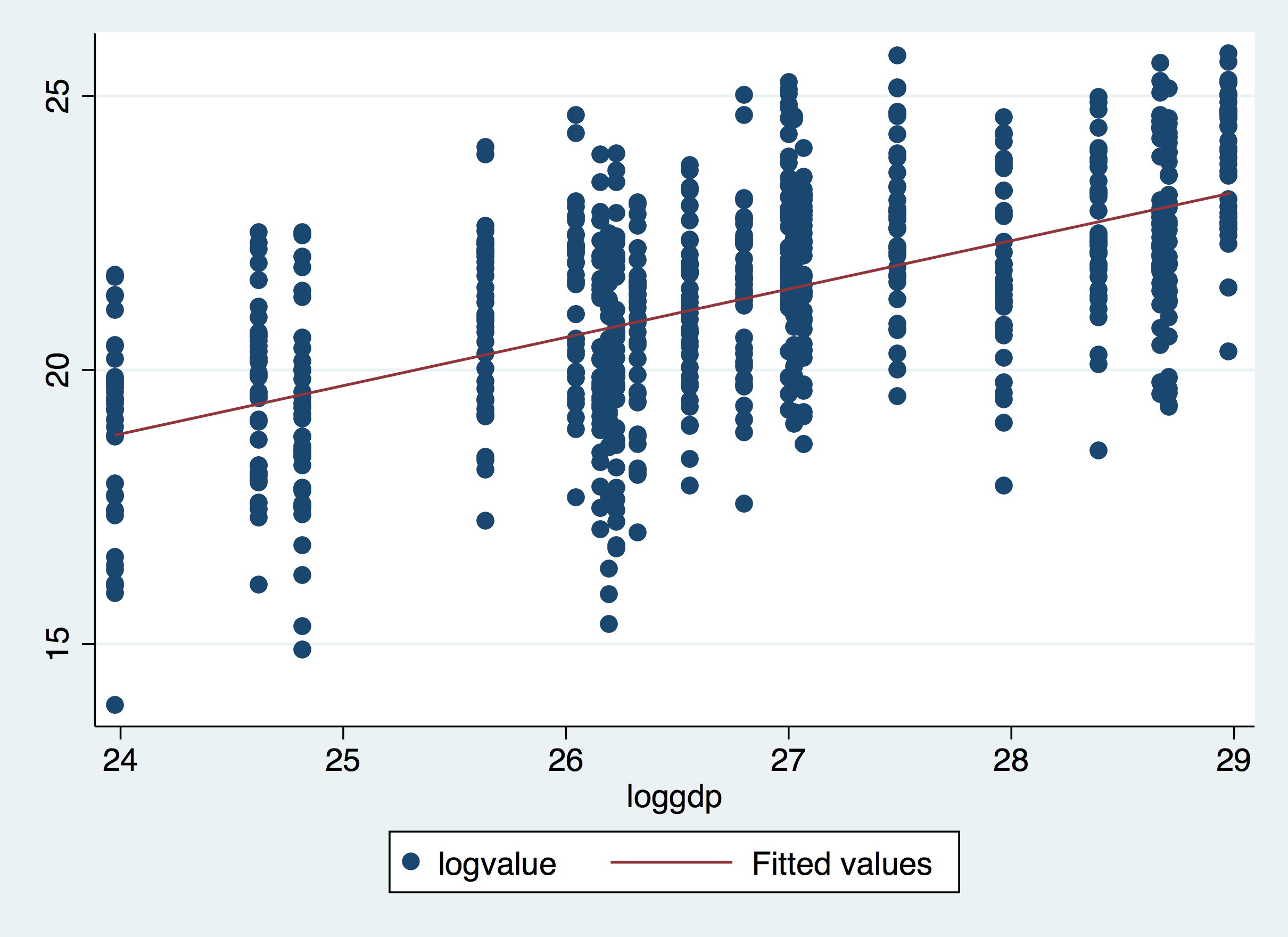


Figure 5:



Graph 1-4:



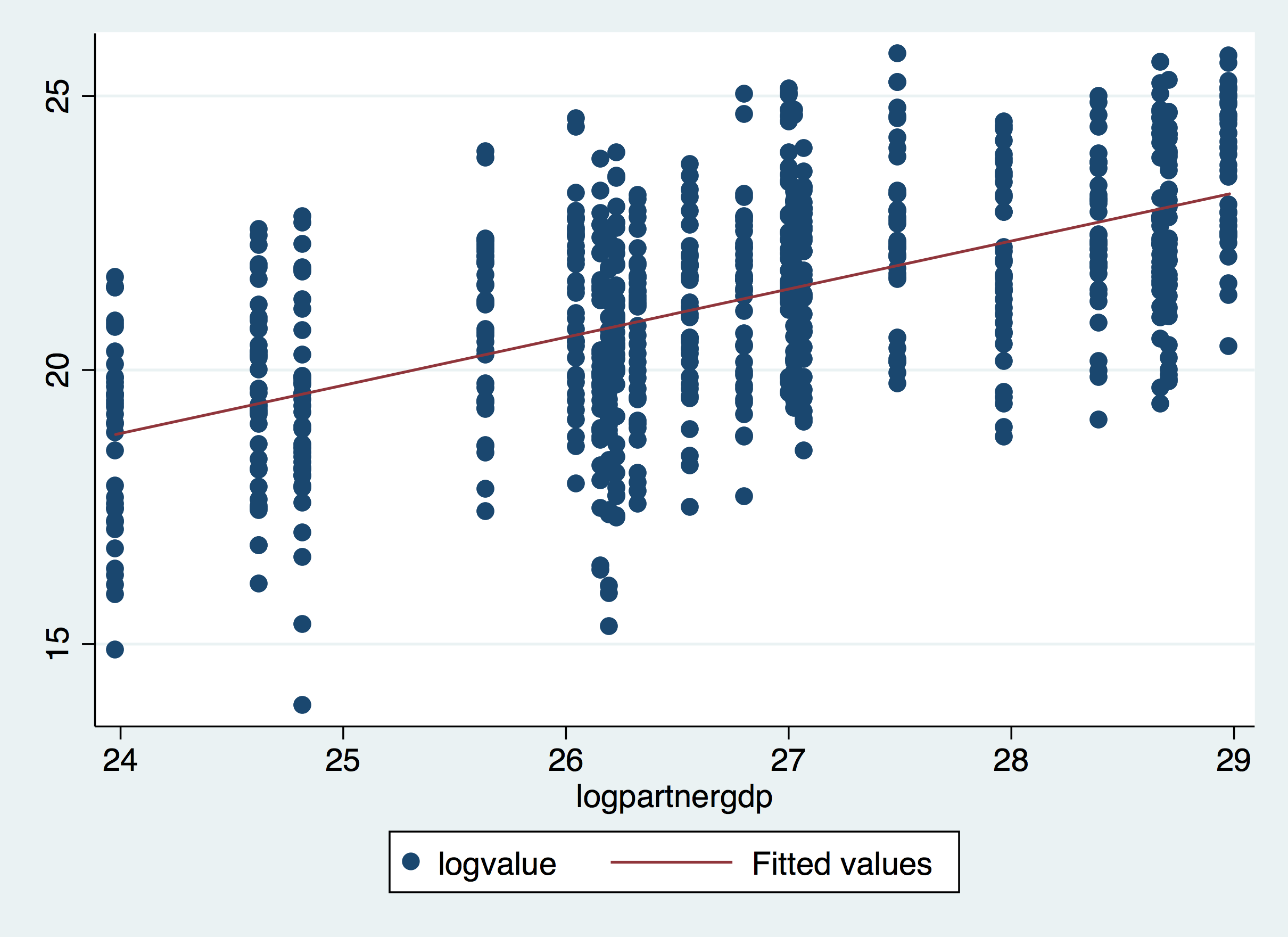


Figure 6:

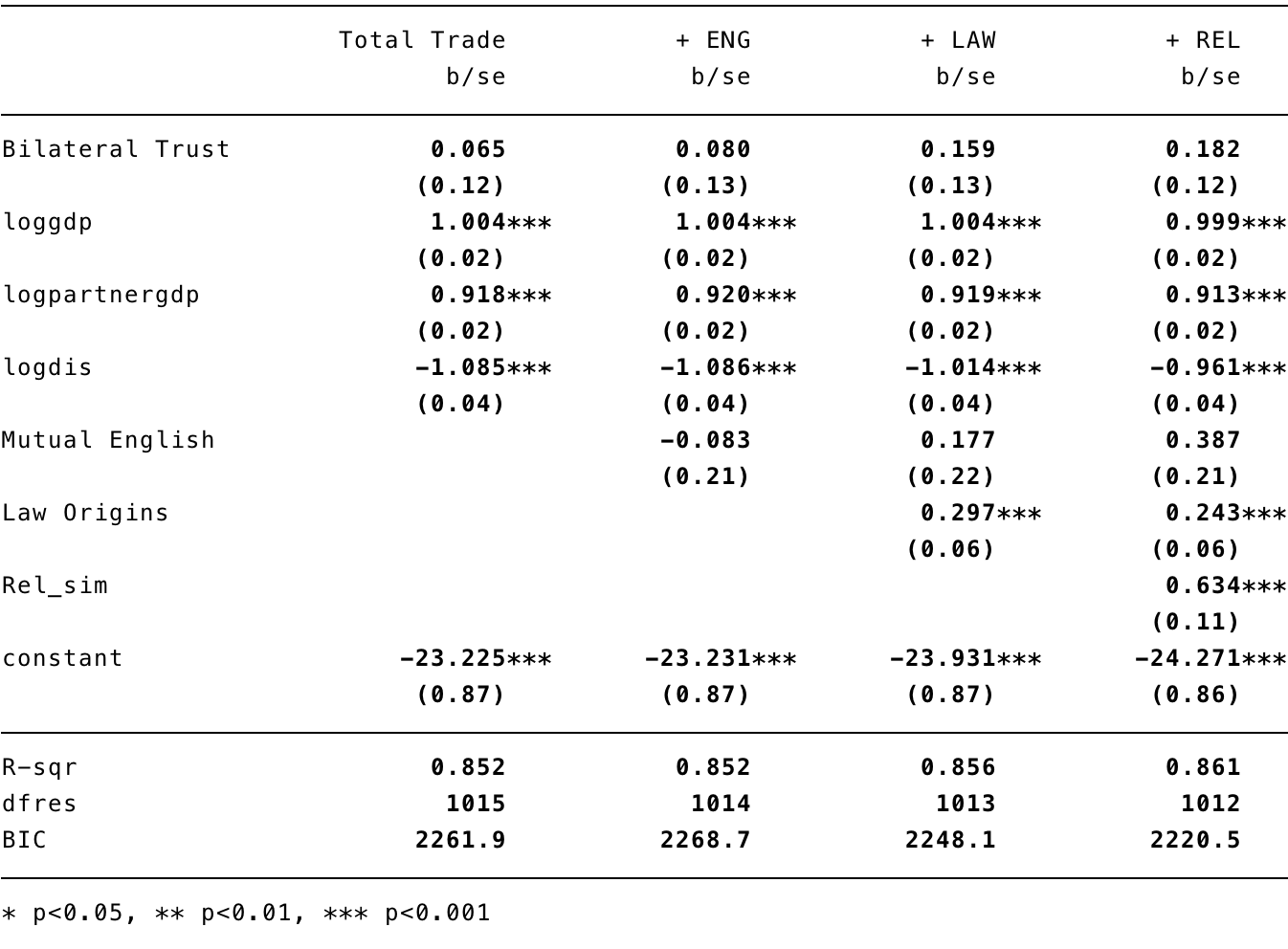


Figure 7:

