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Thesis title:

Essays in Institutional and Political Economics

PhD in	Economics
Cycle	23
Candidate's tutor	Maristella Botticini
Year of discussion	2012

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ESSAYS IN INSTITUTIONAL AND POLITICAL ECONOMICS

Dissertation in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Economics (XXIII Cycle)

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Bocconi University

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Acknowledgments

I would like to express my gratitude to my thesis committee, Prof. Maristella Botticini, Prof. Vincenzo Galasso and Prof. Andreas Madestam.

In addition, I am indebted to Alberto Alesina, Marianna Battaglia, Andrea Ciani, Paolo Epifani, Gianluca Femminis, Idil Goksel, Nenad Kos, Lara Lebedinski, Marinella Leone, Monica Masucci, Tommaso Monacelli, Annaig Morin, Alberto Osnago, Manasa Patnam, Michele Pelizzari, Roberto Perotti, Daniele Siena, Filippo Taddei and Simone Cerreia Vioglio as well as to the participants of seminars at Bocconi University, EDGE 2011 Jamboree and 13th ICFB conference for their comments and support.

Lastly, and most importantly, I would like to utter my hearty gratefulness to my parents, Semiha and Huseyin Gokmen, for their unending love and support.

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Introduction

This dissertation contributes to the growing literature that studies the interactions among economic and political institutions, cultural values, and economic performance. It consists of three chapters.

The first chapter concentrates on the "Clash of Civilizations" hypothesis. In a series of influential studies, Huntington (1993a, 1993b, 1998) argued that the fundamental source of conflict in the post-Cold War world will not be primarily ideological or economic, but rather the great divisions among humankind. Given the fault lines between civilizations, the primary axis of conflict in the future will be civilization clashes. Using Huntington's civilizational typology I first investigate whether countries that belong to different civilizations tend to be more involved in militarized conflict than countries that belong to the same civilization. I run tests both on cross-sectional level and over a panel of years between 1816 and 2001. Findings suggest that civilizational differences do in fact matter. Over the entire sample of 1816-2001 I show that dissimilarity in civilization in a dyad increases the probability of conflict by up to 62.8 percentage points. Moreover, I break down the investigation into Cold War and post-Cold War periods by making comparisons between these two epochs. Strikingly, even when geographic, political, military and economic factors are taken into account, being part of different civilizations in the post-Cold War period brings about 71.2 percentage points higher probability of conflict than belonging to the same civilization, whereas it reduces the probability of conflict by 25.7 percentage points during the Cold War. Furthermore, I step up the scrutiny by challenging Huntington's civilizational typology. Using Ellingsen's (2000) data set, I make use of binary indicators of whether the two countries in a dyad have the same majority religion, the same majority language and the same majority ethnicity. I reaffirm Huntington's thesis with the evidence that in the post-Cold War period if the two countries share the same religion they have 71 to 75 percent lower probability of conflict and this probability is slightly lowered to 67 to 70 percent if they speak the same language.

In the second chapter of my thesis, estimating a theory based gravity model of international trade and using a comprehensive set of cultural variables that allow us to look at different aspects of culture, I first show that cultural dissimilarity (similarity) negatively (positively) affects bilateral imports of countries. Based on Huntington's (1998) typology of civilizations, I provide evidence that when two countries in a dyad are members of different civilizations their mean imports are up to 34 percent lower than that of two countries of the same civilization. Furthermore, I extend the analysis using Ellingsen's (2000) measure of religious, ethnic and linguistic fragmentation within countries. Evi-

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dence suggests that while two countries with the same dominant ethnicity have 38 percent higher mean imports, two countries with the same dominant language enjoy 58 percent higher mean imports. More importantly, I examine Huntington's the *Clash of Civilizations* hypothesis and provide evidence that the impact of cultural heterogeneity on trade flows is much more accentuated in the post-Cold War period than during the Cold War, confirming Huntington's thesis from an economic standpoint. This effect is found to be very strong. In the post-Cold War period, two countries that belong to different civilizations have 41 percent lower mean imports than those of the same civilization, whereas this effect is insignificant during the Cold War. Alternatively, in the post-Cold War epoch, the average bilateral imports of a country pair sharing the same majority religion, ethnicity and language are 76 percent higher than those that do not share the same heritages, whereas this effect is not significant in the Cold War era.

The third chapter looks into the effects of a capital markets shocks on social mobility and inequality in a theoretical setup. Whenever crises hit an economy issues of who is affected and how are hotly debated. In that respect, this paper is a stylized study of the effects of a capital markets shocks on nonparticipants, social mobility and inequality. To that end, I first present a theoretical model in which a continuum of individuals endogenously determine whether to participate in capital markets and become an entrepreneur or just deposit their earnings with a bank. Once the theoretical framework is set up and the equilibrium conditions are set out I run quantitative analyses to see the evolution of some of our variables of interest such as inequality and social mobility and look into the effects of a negative capital markets shock. Findings from simulations suggest that, contrary to the popular public opinion, inequality decreases on impact after a negative shock in capital markets. Therefore, this study suggests that the effects of a shock on inequality are not always straightforward and highlights the importance of a better understanding of the distributional issues during crises. As a consequence, much more heed should be paid to short-term and long-term consequences of adverse shocks and further research is required.

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1 Clash of Civilizations: Impact of Culture on Militarized Interstate Dispute

Abstract

In a series of influential studies, Huntington (1993a, 1993b, 1998) argued that the fundamental source of conflict in the post-Cold War world will not be primarily ideological or economic, but rather the great divisions among humankind. Given the fault lines between civilizations, the primary axis of conflict in the future will be civilization clashes. This paper tests Huntington's hypothesis evaluating the impact of culture on militarized interstate disputes. In particular, we investigate whether countries that belong to different civilizations tend to be more involved in conflict than countries that belong to the same civilization. We show that over the period of 1816-2001, dissimilarity in civilization in a dyad increases the probability of conflict by up to 62.8 percentage points. More strikingly, even after controlling for geographic, political, military and economic factors, being part of different civilizations *in the post-Cold War period* brings about 71.2 percentage points higher probability of conflict than belonging to the same civilization, whereas it reduces the probability of conflict by 25.7 percentage points *during the Cold War.*

JEL Classification: D74, N40, N70, Z10.

Keywords: civilizations, clash, conflict, culture, militarized dispute.

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> *In class and ideological conflicts, the key question was "Which side are you on?" and people could and did choose sides and change sides. In conflicts between civilizations, the question is "What are you?" That is a given that cannot be changed. And as we know, from Bosnia to the Caucasus to the Sudan, the wrong answer to that question can mean a bullet in the head. (Samuel P. Huntington, 1993)*

Introduction

In the summer of 1993 Foreign Affairs published an article entitled "The Clash of Civilizations?" by Samuel Huntington, which generated a myriad of discussion, controversy, sympathy and antipathy. The article posed the question of whether conflicts between civilizations would dominate the future of world order. Defining a civilization as the broadest cultural entity and identity under which people form the highest cultural grouping Huntington (1993a, 1993b, 1998, 2000) claims that the primary axis of conflict in today's post-Cold War world will be along civilizational lines. Consequently, he concludes that the greatest threat to world peace are conflicts between civilizations.

The objective of this study is to evaluate the impact of culture at large on militarized interstate disputes and, at the same time, to confront several of Huntington's hypotheses. Using Huntington's civilizational typology we first investigate whether countries that belong to different civilizations tend to be more involved in militarized conflict than countries that belong to the same civilization. We run tests both on cross-sectional level and over a panel of years between 1816 and 2001. Our findings suggest that civilizational differences do in fact matter. Over the entire sample of 1816-2001 we show that dissimilarity in civilization in a dyad increases the probability of conflict by up to 62.8 percentage points.

Moreover, we break down our investigation into Cold War and post-Cold War periods and take a closer look into Huntington's hypothesis by making comparisons between these two epochs. Strikingly, even when geographic, political, military and economic factors are taken into account, being part of different civilizations in the post-Cold War period brings about 71.2 percentage points higher probability of conflict than belonging to the same civilization, whereas it reduces the probability of conflict by 25.7 percentage points during the Cold War.

Additionally, we distinguish between countries involved in conflict of any level and those escalated to a war and question the validity of indicator of war as a dependent

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variable. Our findings suggest that use of war as a dependent variable does not give conclusive evidence as the number of observations on war occurrence is very limited, which hinders soundness of the estimations.

Furthermore, we step up our scrutiny by challenging Huntington's civilizational typology from various aspects. We first show that Huntington's clash of civilizations hypothesis is confirmed even when we control for time fixed effects and prove that they are not spurious. Subsequently, we contrast Huntington's categorization against the popular cultural proxy of genetic distance.[1] We show that binary indicator of different civilizations constructed from Huntington's civilizational classification survives inclusion of genetic distance measures into the estimation and it explains more than what is captured by genetic distance variable. Lastly, we use alternative measures of culture/civilization. Based on the data set on religious, linguistic and ethnic fragmentation within countries between 1945-1994 collected by Ellingsen (2000)[2] we make use of binary indicators of whether the two countries in a dyad have the same majority religion, the same majority language and the same majority ethnicity. We reaffirm Huntington's thesis by providing evidence that in the post-Cold War period if the two countries share the same religion they have 71 to 75 percent lower probability of conflict and this probability is slightly lowered to 67 to 70 percent if they speak the same language.

Impact of ethnicity, language, history, tradition, social norms, culture and religion at large on institutions and the economy have long been studied.[3] In the particular context of conflict occurrence, there are studies on both intrastate and interstate conflict.[4] Fearon and Laitin (2003), for example, suggest that after controlling for per capita income, more ethnically or religiously diverse countries have been no more likely to experience significant civil violence in post-Cold War period. Instead, they propose poverty, political instability, rough terrain and large populations as the factors characterizing countries at

[1] Genetic distance variable is an index measuring the genetic variance between populations as a fraction of the total genetic variance and it is used by many authors as a proxy for cultural distance. More details on genetic distance variable are to follow in subsection 5.2.

[2] The original data by Ellingsen (2000) have been extended up until 2001 by Gartzke and Gleditsch (2006).

[3] See, for instance, Mauro (1995), La Porta et al. (1999) and Treisman (2000) for analyses of the impact of culture on institutions. Furthermore, Easterly and Levine (1997) and Alesina et al. (2003) are seminal examples illustrating the effects of ethnic, linguistic and religious fragmentation on the economy through their impact on public policies, infrastructure and productive public goods. In the latter study, it is important to note that the authors construct a commonly referred to data set on ethnic, linguistic and religious fractionalization. As a side note, another index of ethnic and cultural fractionalization commonly used by economists and political scientists alike is constructed by Fearon (2003).

[4] See Garfinkel and Skaperdas (2006) for a review of the recent theoretical literature on conflict and appropriation from an economic perspective, specifically, by applying conventional optimization techniques and game-theoretic tools to study the allocation of resources among competing activities— productive and otherwise appropriative, such as grabbing the product and wealth of others as well as defending one's own product and wealth.

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risk of civil war.[5] On the other hand, Spolaore and Wacziarg (2010) and Martin et al. (2008), among others, study interstate conflicts. Spolaore and Wacziarg (2010) examine the theoretical and empirical relationship between the occurrence of interstate conflicts and the degree of relatedness between countries. Using genetic proximity as a measure of cultural traits they show that genetically closer populations are more prone to go to war with each other as these populations share closer ideal points and a bigger lot of common problematic issues. Martin et al. (2008), instead, emphasize the role trade links play in interstate dispute and show that while strong bilateral trade relations reduce the probability of conflict, good multilateral trade relations with third parties augment it.

More specific to the Huntington's hypothesis, there are as well several studies in the literature that try to tackle Huntington's thesis from different angles. Using data from 1820 to 1989 Henderson (1997, 1998) analyze the impact of cultural factors on the relationship between joint democracy and war involvement and finds that both ethnic and linguistic similarities have a direct association with war, whereas religious similarity within dyads decreases the likelihood of a war. He also finds that when a pair of states share a common democratic political culture, democracy exerts a conflict dampening impact that overrides ethnic, linguistic, or religious factors. Russett et al. (2000) and Henderson and Tucker (2001) assess the incidents of militarized interstate disputes during the periods 1950-92 and 1816-1992, respectively. They find that such traditional realist influences as contiguity, alliances and relative power as well as liberal influences of joint democracy and interdependence provide a much better account of interstate conflict involvement and that intercivilizational dyads are less, and not more, conflict prone. Chiozza (2002) runs an empirical test of Huntington's thesis using Kosimo data between 1946-1997 that include nonviolent conflicts and shows that state interactions across the civilizational divide are not more conflict prone.[6]

Though all of them are valuable in their own respect, one should acknowledge the limitations of the studies described above. First of all, coverage of the post-Cold War period is extremely limited. Exactly to the point, Huntington puts his argument forward and makes predictions specifically about the post-Cold War world. Secondly, a direct test of Huntington's hypothesis based on the classification of civilizations is not the central theme of all of the above studies, but rather an index of ethnic, cultural or religious similarity is used in some of the studies. Although, such measures might be very insightful, a

[5] Another example of intrastate conflict is Garcia-Montalvo and Reynal-Querol (2002). They argue that the index of ethnic polarization predicts civil wars better than the index of fractionalization and suggest that different measures of heterogeneity might be needed depending on the question under scrutiny.

[6] Other related studies are Norris and Inglehart (2002), Mungiu-Pippidi and Mindruta (2002), Bolks and Stoll (2003), Gartzke and Gleditsch (2006) and Jakobsen and Jakobsen (2010).

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more befitting starting point would be Huntington's own typology. Thirdly, survey data are also put under scrutiny. Though such data might deepen our understanding, they rather reflect values and beliefs than actual conflict itself. Given the amount of limitations suffered by these studies we see it necessary to confront Huntington's hypothesis with more recent and more detailed data taking the basis of civilizations mapped out by him as a starting point and building upon it with the usage of different estimation strategies and alternative measures of culture.

The remainder of the paper proceeds as follows. In Section 2 we take a look at what the clash of civilizations hypothesis is and give a brief account of it. In Section 3 we describe the data set used and the methodology applied for the analyses. Section 4 presents our results. Section 5 provides robustness checks. Finally, Section 6 gives some concluding remarks.

The Clash of Civilizations Hypothesis?

In 1993 Samuel Huntington published his article entitled "The Clash of Civilizations?" in Foreign Affairs, in response to Francis Fukuyama's 1992 book, *The End of History and the Last Man*. His article immediately provoked a lot of controversy and heated debate, and subsequently became one of the most oft-cited articles in the field of international relations. Put briefly, Huntington (1993a, 1993b, 1998, 2000) argued that the fundamental source of conflict in the new world, i.e. in the post-Cold War world, will not be primarily ideological nor primarily economic, but the great divisions among humankind; as such, the primary axis of conflict in the future will be along cultural lines.

Huntington takes civilizations as the main unit of his analyses. A civilization is defined as "a cultural entity, the highest cultural grouping of people and the broadest level of cultural identity people have short of what distinguishes humans from other species. It is defined both by common objective elements, such as language, history, religion, customs, institutions, and by the subjective self-identification of people."[7] Huntington takes the central defining characteristic of a civilization as its religion; hence, the major civilizations in human history have been closely identified with the world's great religions. These civilizations outlined include the Sinic, Japanese, Hindu, Islamic, Orthodox, Western, Latin American, Buddhist and possibly African civilizations plus "lone" countries that do not belong to any of the major civilizations.

According to Huntington, inter-civilizational differences stand out in the way individu-

[7] Huntington (1993a), p.23-24.

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als comprehend the relations between God and man, the individual and the group, the citizen and the state, parents and children, husband and wife as well as in the weight of importance they put in matters of responsibility and rights, freedom and authority, and equality and hierarchy. He further claims that these differences are largely irresolvable; they are the product of centuries and are far more fundamental than differences among political ideologies and political regimes as they concern the very self-identification of man. The fact that people identify themselves with a civilization inevitably implies that they think of themselves separately from other civilizations and differentiate themselves from the members of other civilizations. To highlight this point, Huntington argues that identity at any level -personal, tribal, racial, civilizational - can only be defined in relation to an "other", a different person, tribe, race, or civilization. This brings about a group identity in the simple form of "us" and "them" which nurtures clashes with those that are different.

Huntington (1993, 1998), viewing culture as the “cause,” suggests that civilizations tend to violence with other civilizations that do not share their culture, world view and values. Such vehement tendencies, he argues, long held in check by the Cold War, have been unleashed by the end of the Cold War and, from then onwards, form the dominant pattern of global conflict. One theorem that logically devolves from Huntington’s cultural realist rendering of clashing civilizations is that the degree of cultural dissimilarity between states should predict the likelihood of conflict between them. In this view, culturally dissimilar dyads, ceteris paribus, should be more inclined to conflict than culturally similar dyads. As such, Huntington claims that in the post-Cold War world the most important distinctions among peoples are not ideological, political, or economic, but they are cultural, and therefore, clashes of civilizations are the greatest threat to world peace. Although nation states will remain the most powerful actors in world affairs, world politics at the macro level are likely to involve conflicts and shifting power balances of states from different civilizations. At the micro level,on the other hand, the most violent, prolonged and dangerous conflicts are likely to be between states and groups from different civilizations. The clash of civilizations will dominate global politics and the fault lines between civilizations will be the battle lines of the future and of today.

As for why civilizations will clash Huntington presents several factors. First, differences between civilizations are basic and fundamental. Civilizations differ from one another by history, language, culture, tradition, and, most importantly, religion. These differences are the product of centuries and cannot be easily overcome, which, in turn, might raise conflictual tensions. Second, the increased interaction among peoples of different civilizations makes the world a smaller place and raises the consciousness and

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awareness of differences between civilizations and commonalities within civilizations. Third, as economic modernization and social change throughout the world separate people from local identities, a resurgence of religious identity is replacing diminishing local and state-based identities. Fourth, increased civilization consciousness sparks a return-to-the-roots phenomenon in non-Western states. The elites of non-Western societies are going through a de-Westernization and indigenization process. Fifth, cultural differences and characteristics are less mutable and less easily compromised than political or economic ones. An example highlights this point. A person can be half-French and half-Arab and a citizen of two countries, but it is not possible to be half-Catholic and half-Muslim. Finally, increased economic regionalization heightens civilization consciousness and, in turn, common civilization facilitates the expansion of economic relations. The interaction of these factors has resulted in the increased salience of civilization membership in global politics. Since civilizational characteristics are basic and essential, civilizational differences are increasingly likely to generate conflict.

To support his thesis Huntington depicts several real world incidents. For instance, wars such as those following the break up of Yugoslavia, in Chechnya, and between India and Pakistan were cited as evidence of inter-civilizational conflict. To draw attention to the fact that states treat other states differently depending on whether they belong to a similar or dissimilar civilization, Huntington exemplifies the failure of the West to provide meaningful support to the Bosnian Muslims in the Yugoslavian War or to denounce Croat atrocities in the same manner Serb atrocities were denounced. To highlight civilizations running up in support of similar civilizations, he points out Russia's unwillingness to join other U.N. Security Council members in getting the Serbs in Croatia to make peace with the Croatian government, and the offer of Iran and other Muslim nations to provide 18,000 troops to protect Bosnian Muslims during the Yugoslavian War. Another example comes from the period of the intensification of the war between Armenians and Azeris: Turkish and Iranian demands that the Armenians surrender their conquests, the deployment of Turkish troops to the border and Iranian troops across the Azerbaijan border, and Russia's warning that the Iranian action contributes to "escalation of the conflict" and "pushes it to dangerous limits of internationalization." Lastly, Huntington makes an example of the U.S. bombings of Baghdad, its virtually unanimous support by Western governments, and its condemnation by almost all Muslim governments as another example of the West's "double standard."

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Data and Methodology

After having laid out the background for the upcoming empirical analysis, in this section we describe the data set used in estimations and spell out the methodological strategy.

Measurement of Conflict

Our data on conflict run between 1816 and 2001.[8] The indicator of conflict takes on a value from 0 for no militarized dispute to 5 for high intensity conflict that is defined as an inter-state war with more than 1000 total battle deaths. The levels of intensity are classified as follows: 1 = No militarized action, 2 = Threat to use force, 3 = Display of force, 4 = Use of force, and 5 = War. In accordance with the literature, we define an indicator variable of conflict taking a value of one if the intensity of militarized conflict is equal to or greater than 3, zero otherwise.[9] We primarily focus on the indicator of conflict, nevertheless we treat the indicator of war (corresponding to a conflict intensity of 5) as dependent variable as well and run analyses accordingly.

Between 1816-2001 there has been an upward trend in the number of militarized conflict per year with spikes of World War I and World War II. We also observe a relative increase starting with early 90's compared to rather high but stable levels of conflict during Cold War.[10] On the other hand, when we look at the proportion of militarized disputes within and across civilizations, we see that 36 percent of all conflict between 1816 and 2001 took place between countries that are part of the same civilization, whereas 64 percent of the conflictual relationships were among different civilizational memberships.[11] When we break this analysis down to Cold War and post-Cold War periods, we observe that there is a bigger percentage of inter-civilizational militarized conflict during Cold War than during post-Cold War, 65 percent compared to 60 percent, which leads us to a hint contrary to Huntington's thesis.[12]

[8] Our conflict data come from the Correlates of War Project. Data for conflict are Correlates of War Project, Militarized Interstate Disputes, Version 3.10; which is described in Ghosn et al. (2004) and Ghosn and Bennett (2003). A data set on war is also available as Correlates of War Project, 2011 COW Wars, 1816-2007, Version 4.0 (for details see also Sarkees and Wayman (2010)).

[9] For an example, see Spolaore and Wacziarg (2010).

[10] Interested reader can consult Figure 1A in the Appendix.

[11] See Figure 2A in the Appendix.

[12] See figures 3A and 4A in the Appendix.

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Measurement of Civilizations

179 countries are classified as members of various civilizations. As described in Section 2, these civilizations are Western, Sinic, Islamic, Hindu, Orthodox, Latin American, African, Buddhist and "Lone" States. The classification and the construction of civilization membership is based on Huntington (1998). Accordingly, each country is assigned to a civilization.[13]

Furthermore, country dyads are formed by pairing each country with one another, which resulted in 15931 dyads. To indicate civilizational heterogeneity within a dyad we construct a variable labeled "Different Civilizations" , DC_{ij}, denoting whether a pair of countries belong to different civilizations. This variable is coded as one if in a dyad the two countries i and j belong to different civilizations and as zero if both countries belong to the same civilization. Out of 15931 country-pairs 2875 pairs are formed with countries belonging to the same civilization and 13056 pairs belonging to different civilizations.

Other Variables

Geographic Factors. Geographical proximity is considered to be one of the strongest determinants of war (Gleditsch and Singer, 1975; Henderson, 1997). As one of the measures of geographical proximity territorial contiguity is shown to be a strong predictor of conflict (Bremer, 1992). The proximity of interactions is likely to offer both the opportunity and the willingness to engage in conflict. Therefore, we take contiguity as one of our independent variables. Our contiguity variable takes value one if there is any sort of land or water contiguity between two countries in a pair, zero otherwise.[14]

As in Spolaore and Wacziarg (2010), we also control for additional geographic distance metrics such as the measure of the great circle (geodesic) distance between the major cities of the countries[15], latitudinal and longitudinal distances and indicators of geographic isolation and geographic barriers such as number of landlocked countries in a dyad and the land area of the countries.[16]

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[13] See Table 1A in the Appendix for the details of country specific civilizational memberships.

[14] For contiguity data we use Correlates of War Project, Direct Contiguity Data, 1816-2006, Version 3.1 (Stinnett et al., 2002). See also Gochman (1991) for additional details.

[15] See Head and Mayer (2002) for details.

[16] These data are compiled by the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII). The data are available at http://www.cepii.fr/anglaisgraph/bdd/distances.htm.

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Political Factors. Factors which might have contributed to the current state of the institutions and to the state of the matters between two countries go back in history. To control for such historical, political and institutional links we include a dummy variable for whether a dyad ever had a colonial relationship, i.e. whether one was a colony of the other at some point in time. In addition, we have a dummy variable for whether a pair of countries have had a common colonizer after 1945, i.e. whether the two countries have been colonized by the same third country. Furthermore, governing bodies leave their legacy on cultural, historical, political and institutional ties and this requires inclusion of a dummy variable to control for whether two countries have ever been part of the same polity.[17]

Democratic peace argument suggests that democratic countries are less prone to violence and democracy promotes peace (Levy and Razin, 2004). We measure the extent of democracy using the 21-point institutionalized democracy scale in a modified version of the Polity IV data where -10 means a hereditary monarchy and +10 a consolidated democracy.[18] As in Martin et al. (2008), we use the sum of the democracy indexes of the two countries in a pair.

Different legal origins have been shown to have strong implications for institutional outcomes (La Porta et al., 1999). These institutional outcomes may, in turn, shape the conflict pattern between two countries. Therefore, we create a dummy variable for whether two countries in a pair have different legal origins. This variable takes value one if the two countries in a dyad have different legal origins, zero otherwise. Legal origin indicators are from La Porta et al. (1999) and are based on the following legal systems: common law, French civil law, German civil law, Scandinavian law and Socialist law.

Military Factors. The idea that an equal balance of military capabilities deters conflict in a contest of arms forces us to control for relative military capabilities of countries (Russet et al., 2000). To this end, we use National Material Capabilities data set. The widely-used Composite Index of National Capability (CINC) index is based on six variables in the data set: total population, urban population, iron and steel production, energy consumption, military personnel, and military expenditure of all state members.[19]

Major military actors are expected to be positively associated with dispute involvement

[17] These data come as well from CEPII. The data are available at http://www.cepii.fr/anglaisgraph/bdd/distances.htm.

[18] The suggested way of categorization and interpretation of these scores by the project authors is as follows. Scores from -10 to -6 correspond to "autocracies", from -5 to +5 to "anocracies" and from +6 to +10 to "democracies". The data are available at http://www.systemicpeace.org/polity/polity4.htm.

[19] We use National Material Capabilites data set Version 4.0 from Correlates of War Project. For details see also Singer (1987) and Singer et al. (1972).

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(Chiozza, 2002). Hence, we control for the number of countries with major power status in a dyad as designated by the authors of the Correlates of War Project.[20]

Widespread expectations about allies are that they fight each other less as they are already in agreement regarding their concerns of security. Likewise, allied states often have other political and economic interests in common (Russet et al., 2000). To control for the influence of alliances on conflict, we include a dummy variable for whether a pair of countries are in some form of alliance.[21]

Furthermore, to take into consideration the continuity of conflictual relationships and the contagion from other disputes we construct two variables. One accounts for the number of peaceful years between two countries since the last conflict between them has occurred. The other one takes into account the number of other wars going on in the world in year t.

Economic Factors. Following the idea of Spolaore and Wacziarg (2010) who find that income differences have an effect on the likelihood of conflict, we take into account the absolute value of the log income difference between two countries in a dyad from 1950 on.[22]

One would also need to not overlook trade relations as economic dependence makes countries less daring when it comes to conflict involvement. For instance, Russet et al. (2000) divide the sum of a country's exports and imports with its dyadic partner by its GDP to see how much this bilateral trade relation is economically important. They claim that, as in the case of the influence of democratic institutions, one expects the likelihood of a dispute to be primarily influenced by the freedom of action available to the state less constrained from using force, i.e. the state with the lower bilateral trade-to-GDP ratio, because it is less economically dependent on trade with the other member of the dyad. On the other hand, Martin et al. (2008) and Spolaore and Wacziarg (2010) take into account bilateral openness between a pair of countries and their multilateral openness with third parties. Following this stream we use bilateral and multilateral openness together with their interaction with distance. Bilateral openness is constructed by dividing the trade volume between a pair of countries by the GDP of each country

[20] Our data come from State System Membership List Version 2008.1 of Correlates of War Project. The designation of major powers also follows COW criteria and includes Austria-Hungary (1816–1918), Prussia/Germany (1816–1918, 1925–1945), Russia/USSR (1816–1917, 1922–), France (1816–1940, 1945–), United Kingdom (1816–), Italy (1860–1943), Japan (1895–1945), United States (1898–), and China (1949–). China, France, the USA, the UK, and the USSR are classified as major powers since 1945, as are the German Federal Republic and Japan after 1991.

[21] Alliances data are Version 3.03 from Correlates of War Project (Gibler, 2009; Gibler and Sarkees, 2004). These data originally date back to Singer and Small (1966) and Small and Singer (1969).

[22] For income data we use Penn World Tables Version 6.2 available at http://pwt.econ.upenn.edu/php_site/pwt_index.php.

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and then taking the average. Multilateral openness, on the other hand, is constructed by dividing the trade volume with third parties of each country in a pair by its GDP and then taking the average.[23]

Descriptive Statistics

We observe in Table 1 the number of conflicts across and within civilizations and their share in the total number of conflicts between 1816 and 2001. On-diagonal entries correspond to the conflicts which have happened between countries that are members of the same civilization; whereas off-diagonal elements are the conflicts between countries that belong to different civilizations. This table gives us a better understanding of what part of the conflicts are inter-civilizational and what part intra-civilizational; moreover, we get a sense of what civilizations have more conflictual relationships than the others.

We observe many on-diagonal elements which tell us that there is a myriad of intra-civilizational disputes, though the numbers are much smaller than off-diagonal entries. By looking at intra-civilizational disputes the most combat prone civilizations seem to be Western and Islamic civilizations followed by a high degree of conflict among Latin American countries with 9.5, 7.9 and 6.8 percents of all conflict, respectively .

One striking observation from Table 1 is that when we look into highly conflictual inter-civilizational linkages we notice that one side usually involves a Western country. For instance, the first four highest number of inter-civilizational conflicts are Western versus Islamic with 13.1 percent, Western versus Orthodox with 12 percent, Western versus Latin American with 7.4 percent and Western versus Sinic civilizations with 6 percent, respectively. This pattern of high Western conflict proneness is followed by the conflicts between Islamic and Orthodox civilizations.

For Cold War and post-Cold War break down of Table 1, see tables 2A and 3A in the Appendix. Important to notice in tables 2A and 3A is that while the highest number of conflict during the Cold War period is between Western and Islamic civilizations, conflicts between Western and Orthodox civilizations are uppermost in the post-Cold War period.

For additional insights at a first glance see also Table 4A in the Appendix which provides summary statistics of all variables.

[23] Trade data come from Correlates of War Project, Trade Data Set, Version 2.0. See also Barbieri et al. (2008, 2009).

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Table 1. Number of Conflicts within and across Civilizations between 1816-2001.

Civilizations	West	Sin	Islam	Hind	Ortho	L.Ameri	Afric	Budd	L.Stat
West	419								
	(9.5%)								
Sin	265	127							
	(6%)	(2.8%)							
Islam	581	15	351						
	(13.1%)	(.34%)	(7.9%)						
Hind	5	33	65	3					
	(.11%)	(.74%)	(1.4%)	(.06%)					
Ortho	530	90	247	0	105				
	(12%)	(2.04%)	(5.6%)	0	(2.3%)				
L.Ameri	326	7	8	11	13	302			
	(7.4%)	(.15%)	(.18%)	(.24%)	(.29%)	(6.8%)			
Afric	39	0	53	5	6	21	193		
	(.88%)	0	(1.2%)	(.11%)	(.13%)	(.47%)	(4.3%)		
Budd	25	81	3	6	5	0	0	78	
	(.56%)	(1.8%)	(.06%)	(.13%)	(.11%)	0	0	(1.7%)	
L.Stat	106	86	44	0	82	41	7	16	4
	(2.4%)	(1.9%)	(.99%)	0	(1.8%)	(.93%)	(.15%)	(.36%)	(.09%)

Source: Author's estimates. Percentages are in parentheses.
Legend: West=Western, Sin=Sinic, Islam=Islamic, Hind=Hindu, Ortho=Orthodox, L.Ameri=Latin American, Afric=African, Budd=Buddhist, L.Stat=Lone States.

Empirical Specification

As a starting point, we collapse the panel into a cross-section (as in Spolaore and Wacziarg, 2010), in which case our dependent variable becomes a binary indicator of whether there has ever been a conflict between a pair of countries over the period of 1816 to 2001. Following the existing literature[24] we run regressions of a binary indicator of conflict on several determinants of conflict. Given our main explanatory variable -civilizational dissimilarity- is time invariant this specification seems appropriate. Therefore the baseline cross-sectional regression is the following:

$$C_{ij} = \beta_0 + \beta_1 DC_{ij} + \beta_2 X_{ij} + \varepsilon_{ij} \tag{1.1}$$

where C_{ij} is an indicator of conflict between a pair of countries and takes the value one if the pair of countries were ever involved in a militarized dispute, and zero otherwise, DC_{ij} is an indicator of civilizational heterogeneity that takes value one when a pair of countries belong to different civilizations and zero otherwise and X_{ij} is a vector of time-invariant control variables such as geographic factors and colonial and legal indicators.

[24] For example, Bremer (1992) and Martin et al. (2008).

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Moreover, we apply a second methodology to exploit the full panel data set. This way we can make use of time varying dimensions of some of our explanatory variables such as democracy or economic indicators. Accordingly, the baseline panel regression would be as follows:

$$C_{ijt} = \gamma_0 + \gamma_1 DC_{ij} + \gamma_2 X^1_{ij} + \gamma_3 X^2_{ijt} + \eta_{ijt} \tag{1.2}$$

X^1_{ij} contains all of the aforementioned time-invariant variables, while X^2_{ijt} is a vector of time-varying variables such as democracy, differences in military capabilities, number of other wars in year t, number of years countries have been at peace with each other, occurrence of an alliance, income differences and trade relations.

Both equations (1.1) and (1.2) are estimated using probit. Throughout the paper we report marginal effects of the probit regressions evaluated at the means of the independent variables and, for the sake of readability, we multiply all of the marginal effects by one hundred in all tables. In addition, we report standardized magnitude of the effect of civilizational dissimilarity, which largely eases interpretation. Standardized magnitude is the effect of a discrete change from zero to one in different civilizations dummy as a percentage of the probability of conflict calculated at the means of the variables.

Results

Baseline Cross Sectional Analyses

In this section we present our results concerning militarized clash between states and the role culture plays in conflict involvement. As a starting point, we run cross-sectional analyses. We collapse our panel data of conflict into one cross-sectional variable that takes on value one if a country pair has ever been involved in militarized dispute from 1816 to 2001, zero otherwise. We use probit models and marginal effects evaluated at the means are presented. There are 178 countries in the cross-section analyses from which country dyads are constructed.

Entire Sample

In Table 2 we present the regression results covering the entire sample, whereas in Table 3 we break down our analysis and make Cold War and post-Cold War comparisons.

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Table 2. Cross-Sectional Regressions, probit.

(Dependent variable: dichotomous indicator for whether a country pair was ever involved in a conflict, 1816-2001).

	(1) univariate specification	(2) add geographic factors	(3) add polical factors	(4) war (dependent variable)
Different Civilizations	-5.8***	.163	.081	.075
	(0.000)	(0.5)	(0.73)	(0.18)
Contiguity		10.84***	9.79***	.781***
		(0.00)	(0.00)	(0.00)
Log Geodesic Distance		-1.95***	-1.80***	-.203***
		(0.00)	(0.00)	(0.00)
Log Abs Diff in Latitudes		-.41***	-.435***	-.104***
		(0.00)	(0.00)	(0.00)
Log Abs Diff in Longitudes		-.064	-.078	-.021
		(0.56)	(0.4)	(0.4)
# Landlocked Countries		-2.3***	-2.30***	-.265***
		(0.00)	(0.00)	(0.00)
Log Product Land Areas		.74***	.728***	.124***
		(0.00)	(0.00)	(0.00)
Ever in Colonial Relationship			7.56***	.403*
			(0.00)	(0.06)
Same Country			4.02***	.54**
			(0.00)	(0.02)
Different Legal Origins			.725***	.00193***
			(0.009)	(0.00)
# Observations	15753	15309	15309	15309
Standardized Magnitude(%)	-132.306	8.297	4.231	34.011

p-values in parentheses; *** significant at 1%; ** significant at 5%; * significant at 10%.

Probit marginal effects are reported in all columns. For dummy variables, marginal effects are for discrete changes from 0 to 1. The standardized magnitude is the effect of a discrete change from 0 to 1 in *different civilizations dummy* as a percentage of the probability of conflict at the means of the variables. All marginal effects are multiplied by 100 for the sake of readability.

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In Table 2 column (1) we start off with a univariate specification. Although, the effect of being in different civilizations on conflict is negative at first, it immediately changes sign in the following columns and becomes positive when we account for other determinants of conflict such as contiguity. We add geographic control variables to the regression equation in column (2) and notice that the coefficient on different civilizational membership becomes positive. Moreover, contiguity has a positive effect on conflict probability. This variable is always highly significant and the biggest in magnitude among all the determinants of inter-state conflict in all the regression specifications. We also control for other geographic measures to account for the distance between countries and the physical barriers within and across countries. These include the distance between countries, differences in longitudes and latitudes, instance of landlocked countries in a dyad and the physical size of the countries. As expected, the physical distance and barriers between countries act as a significant deterrent to militarized clashes.

In column (3) of Table 2 we take into account political factors that might affect conflict likelihood such as colonial links, whether the countries have been part of the same polity and their legal origins. Our results suggest that colonial and governmental history play a significant role for they instigate conflict involvement. Moreover, having different legal origins decreases the probability to find a peaceful solution to their problems.

In column (4) of Table 2, instead, we run a similar regression to that of column (3) using an indicator of war (conflicts of level 5 with more than 1000 battle deaths) as dependent variable rather than conflict of level 3 and above. We observe the positive effect of different civilizational membership on war involvement and all conclusions regarding other explanatory variables carry on.

To put the importance of belonging to different civilizations in perspective we take a look at the standardized magnitudes. In columns (2) and (3) we observe that being part of different civilizations increases the probability of conflict by 4.2 to 8.2 percentage points; whereas it increases the probability of war by 34 percentage points as shown in column (4).

Cold War and post-Cold War Comparisons

Although we had, by and large, a first pass at investigating the impact of culture on conflict involvement in Table 2, it is far from satisfactory and does not directly test Huntington's hypothesis. Next, we present a break-down analysis of Cold War and post-Cold War periods, which are to be followed by more detailed panel analysis.

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Table 3. Cross-Sectional Regressions, probit.

(Dependent variable: dichotomous indicator for whether a country pair was ever involved in a conflict, Cold War and post-Cold War Comparisons).

	(1)	**(2)**	**(3)**	**(4)**
	Cold War	post-Cold War	Cold War	post-Cold War
	period	period	period	period
Different Civilizations	.104	.173***	.057	.166***
	(0.46)	(0.001)	(0.69)	(0.001)
Contiguity	6.001***	1.167***	5.33***	1.08***
	(0.00)	(0.00)	(0.00)	(0.00)
Log Geodesic Distance	-.585***	-.306***	-.51***	-.289***
	(0.00)	(0.00)	(0.00)	(0.00)
Log Abs Diff in Latitudes	-.178***	-.17***	-.185***	-.165***
	(0.002)	(0.00)	(0.001)	(0.00)
Log Abs Diff in Longitudes	-.237***	-.098***	-.239***	-.096***
	(0.00)	(0.00)	(0.00)	(0.00)
# Landlocked Countries	-1.2203***	-.131***	-1.21***	-.111**
	(0.00)	(0.005)	(0.00)	(0.013)
Log Product Land Areas	.335***	.126***	.324***	.119***
	(0.00)	(0.00)	(0.00)	(0.00)
Ever in Colonial Relationship			1.99***	.302
			(0.00)	(0.12)
Common Colonizer			-.225	-.203***
			(0.27)	(0.002)
Same Country			2.69***	.209
			(0.00)	(0.2)
Different Legal Origins			.291**	-.0086
			(0.019)	(0.8)
# Observations	15309	15309	15309	15309
Standardized Magnitude(%)	12.323	69.626	6.974	70.152

p-values in parentheses; *** significant at 1%; ** significant at 5%; * significant at 10%.

Probit marginal effects are reported in all columns. For dummy variables, marginal effects are for discrete changes from 0 to 1. The standardized magnitude is the effect of a discrete change from 0 to 1 in *different civilizations dummy* as a percentage of the probability of conflict at the means of the variables. All marginal effects are multiplied by 100 for the sake of readability.

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Columns (1) and (2) of Table 3 provide us with a comparison of Cold War and post-Cold War periods, respectively, using geographic controls while columns (3) and (4) serve the same purpose using additional political control variables. In columns (1) and (3) the dependent variable is an indicator of whether a pair of countries have ever been involved in a conflict between 1946 and 1991, the period which corresponds to the Cold War, whereas in columns (2) and (4) the dependent variable is an indicator of whether a pair of countries have ever been involved in conflict between 1992 and 2001.

In both specifications with geographic factors only and with additional political factors, countries that belong to different civilizations are more likely to be involved in militarized dispute in the post-Cold War era than in the Cold War era. During the Cold War the coefficient is both insignificant and small in magnitude. This result delivers support for Huntington's hypothesis stating that civilizational differences are more emphasized since the end of the Cold War and that countries that are part of the same civilization conflict with one another less than the ones that belong to different civilizations. Being part of different civilizations boosts the likelihood of conflict by about 70 percentage points during the post-Cold War compared to a 6.9 to 12.3 percentage-point increase during the Cold War.

In addition, importance of distance and physical barriers in conflict involvement is lesser in the post-Cold War period than in the Cold War period. This might be due to advancement of the military technology over time enabling countries to have better, more sophisticated military capabilities in recent times. Advanced military technology might render more distant wars feasible so that proximity of countries do not play as big of a role as it used to when it comes to raiding a target.

Furthermore, notice in columns (3) and (4) that dissimilar legal origins lose their consequence in the post-Cold War era. This might be the case because more countries adopted democracy when communism collapsed and this fact washes out the legal differences between countries when both are democratic.[25]

See also Table 5A in the Appendix for a reproduction of Table 3 using the indicator of war as dependent variable. In Table 5A, though positive, coefficients on different civilizations are not significant in the post-Cold War period. This might be due to the very small number of wars in the post-Cold War period. Indeed, there are only 20 wars in the post-Cold War period.

[25] The correlation between different legal origins dummy and the sum of democracy indexes variable is about .10.

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Panel Analyses

Entire Sample

Now, we turn to our panel regressions. We have an indicator variable of conflict for the years 1816 to 2001; hence this gives us a good coverage of the post-Cold War period and enlarges the number of observations. Moreover, a panel data set allows us to make use of the time-varying dimension of the variables such as democracy, military and economic factors, and therefore, enriches the analysis. Table 4 reports the results covering 1816 to 2001. Our findings from cross-sectional regressions are confirmed by this panel setting.

The same set of regressors as in columns (2) and (3) of Table 2 is used in columns (2) and (3) of Table 4, namely geographic and political determinants of conflict. These two tables only contrast by the use we make of panel dimension. In columns (2) and (3) of Table 4 the results show that if a pair of countries belong to different civilizations they have 55.2 to 62.8 percentage points higher chances of conflict than if they were to be part of the same civilization.

In column (4) we bring the democratic peace argument into the picture and control for the sum of democracy indexes of the two countries as in Martin et al. (2008).[26] As expected, democracy promotes peace. Our variable on civilizational dissimilarity is still positively significant and differential civilizational membership in a dyad brings about 41.5 percentage points higher likelihood of conflict.

Table 5 includes all of the previously discussed geographic and political factors including democracy, but does not report them due to space constraints. We only report the additional variables of military and economic factors. We show that different civilizational membership still appears positive and significant and increases the probability of conflict by 7.7 to 24.4 percentage points.

More specifically, in column (1) of Table 5 we add to the previously present geographic and political factors military factors such as number of major military powers in a dyad, log of absolute differences in military capabilities of the two countries, whether the pair of countries are part of an alliance, number of other wars fought in the same year and the number of years the two countries spent at peace with each other. The coefficient on civilizational dissimilarity is positive and significant. Moreover, notice that big players in the world scene are more conflict prone. If a pair of countries are part of an alliance they fight less, but they are negatively affected by the other wars in the world. It is

[26] For a discussion on the democratic peace argument see Henderson (1997) and Levy and Razin (2004).

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Table 4. Panel Regressions, probit.

(Dependent variable: dichotomous indicator of conflict between 1816-2001)

	(1) univariate specification	(2) geographic factors	(3) political factors	(4) control democracy
Different Civilizations	-.8043***	.131***	.1106***	.096***
	(0.00)	(0.00)	(0.00)	(0.00)
Contiguity		1.115***	1.065***	1.31***
		(0.00)	(0.00)	(0.00)
Log Geodesic Distance		-.149***	-.144***	-.117***
		(0.00)	(0.00)	(0.00)
Log Abs Diff in Latitudes		-.078***	-.074***	-.089***
		(0.00)	(0.00)	(0.00)
Log Abs Diff in Longitudes		-.0485***	-.048***	-.065***
		(0.00)	(0.00)	(0.00)
# Landlocked Countries		-.214***	-.19***	-.223***
		(0.00)	(0.00)	(0.00)
Log Product Land Areas		.0874***	.084***	.09***
		(0.00)	(0.00)	(0.00)
Ever in Colonial Relationship			.221***	.344***
			(0.00)	(0.00)
Common Colonizer			-.063***	-.093***
			(0.00)	(0.00)
Same Country			.131***	.086***
			(0.00)	(0.004)
Different Legal Origins			.121***	.1406***
			(0.00)	(0.00)
Sum of Democracy Indexes				-.0026***
				(0.00)
# Observations	590337	583546	583546	488085
Standardized Magnitude(%)	-114.749	62.889	55.201	41.555

Robust p-values in parentheses; *** significant at 1%; ** significant at 5%; * significant at 10%.

Probit marginal effects are reported in all columns. For dummy variables, marginal effects are for discrete changes from 0 to 1. The standardized magnitude is the effect of a discrete change from 0 to 1 in *different civilizations dummy* as a percentage of the probability of conflict at the means of the variables. All marginal effects are multiplied by 100 for the sake of readability.

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important to highlight that peace promotes peace, i.e. the longer the countries have peaceful relations with one another the less likely it is for them to be caught up in a fight.

In columns (2) and (3) of Table 5 we account for the economic factors.[27] As such, we include the absolute difference in log per capita income as well as bilateral and multilateral trade relations in our regression. Observe that the bigger the income difference between countries is, the smaller are the odds for a conflict. This might be due to the weaker country acknowledging the fact of not being able to cope with a richer country and looking for peaceful ways to settle the issues. To avoid reverse causality between conflict and trade relations we lag the trade variables by four periods. As in Martin et al. (2008) we establish the negative effect of bilateral interdependence and the positive effect of trading with third parties on conflict probability. In both cases distance operates in the opposite direction and lessens the effect of trade links. The coefficient on different civilizations dummy maintains its positive sign, though insignificant.

Cold War and post-Cold War Comparisons

To carry Cold War and post-Cold War comparisons we start with looking at Table 5 again.[28] In column (4) of Table 5 we augment the specification in column (3) by adding a post-Cold War dummy and its interaction with different civilizations variable. This way we will have an idea about the differential effects of civilizational dissimilarity in two different time periods. Notice that the sign of post-Cold War dummy is negative which tells us that in general the probability of conflict is smaller in the post-Cold War period. When we look at the interaction of post-Cold War dummy and different civilizations variable we observe a positive and significant coefficient which means that civilizational differences matter more in the post-Cold War world. Therefore, our results suggest that while being part of different civilizations reduces the probability of conflict by 14.9 percentage points in the Cold War era, it increases the likelihood of conflict by 86 percentage points in the post-Cold War era.

To further probe this argument we split the sample into Cold War and post-Cold War periods. Results reporting the specifications with military and economic factors in two

[27] The drop in the number of observations is because the income data start from 1950.
[28] As mentioned before, Cold War corresponds to 1946-1991 and post-Cold War is 1992 on. When income variables added to the regression though, Cold War is considered from 1950 on due to data availability.

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Table 5. Panel Regressions, probit.

(Dependent variable: dichotomous indicator of conflict between 1816-2001)

	(1) military factors	**(2)** income difference	**(3)** trade relations	**(4)** add post-Cold War Dummy
Different Civilizations	.0171***	.00931**	.00307	-.00593
	(0.00)	(0.04)	(0.55)	(0.33)
# Major Powers	.1134***	.0607***	.0457***	.04348***
	(0.00)	(0.00)	(0.00)	(0.00)
Log Abs Diff Military Capability	.0155***	.0082***	.0052***	.00538***
	(0.00)	(0.00)	(0.009)	(0.006)
Alliance Dummy	-.0179***	.000723	-.00333	-.00315
	(0.00)	(0.9)	(0.59)	(0.6)
# Other Wars in t	.00158***	.000199**	.000277**	.000252**
	(0.00)	(0.05)	(0.014)	(0.032)
# Peaceful Years	-.00588***	-.00344***	-.00352***	-.00354***
	(0.00)	(0.00)	(0.00)	(0.00)
Abs Diff Log pc Income		-.0065***	-.00397**	-.00427***
		(0.00)	(0.013)	(0.006)
Log Bi Openness, t-4			-.0449***	-.04385***
			(0.00)	(0.00)
Log Multi Openness, t-4			.04142	.04777*
			(0.15)	(0.10)
Log Dist×Log Bi Open			.00574***	.00567***
			(0.00)	(0.00)
Log Dist×Log Multi Open			-.00665*	-.00755**
			(0.07)	(0.04)
Post-Cold War Dummy				-.01657**
				(0.03)
Diff Civil×Post-Cold War				.03994***
				(0.001)
# of Observations	487276	217188	149646	149646
Standardized Magnitude(%)	24.47	22.785	7.736	-14.99–86.014

Robust p-values in parentheses; *** significant at 1%; ** significant at 5%; * significant at 10%.

Probit marginal effects are reported in all columns. For dummy variables, marginal effects are for discrete changes from 0 to 1. The standardized magnitude is the effect of a discrete change from 0 to 1 in *different civilizations dummy* as a percentage of the probability of conflict at the means of the variables. All marginal effects are multiplied by 100 for the sake of readability. In addition to the variables reported all regression columns include Contiguity, Log Geodesic Distance, Log Absolute Difference in Latitudes, Log Absolute Difference in Longitudes, Number of Landlocked Countries in the Pair, Log Product of Land Areas in sq km, Ever in Colonial Relationship, Common Colonizer, Countries were or are the Same Country, Different Legal Origins and Sum of Democracy Indexes.

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different epochs are presented in Table 6.[29] We observe that civilizational differences

are less important in the post-Cold War period when we fail to account for economic factors. However, this conclusion is reversed when we control for all of our variables on geographic, political, military and economic factors, which means that columns (1) and (2) might be suffering from omitted variables bias. In columns (3) and (4) of Table 6, on one hand, we show that when a pair of countries in the post-Cold War era belong to different civilizations they have 71.3 percentage points higher probability of being involved in conflict than countries that belong to the same civilization and this effect is very significant. During the Cold War, on the other hand, more similar countries are prone to militarized dispute and if two countries in a dyad are members of different civilizations their chances of conflict is reduced by 25.7 percentage points. These results in columns (3) and (4) of Table 6 leads us to a conclusion that is supportive of Huntington's thesis. Namely, the effect of civilizational differences is more accentuated in the post-Cold War era than in the Cold War era.

Robustness Checks

In this section we challenge our findings by using various sensitivity tests. We do that first by adding time fixed effects to our full specification. Then we contrast our measure of civilizations/culture with a popular measure of genetic distance. Finally, we test our hypothesis using other measures of culture.

Adding Time Fixed Effects

In Table 7 we present the results of regressions for different time periods with our full set of control variables (not reported in the table) and time fixed effects. Time fixed effects could be an important dimension of conflict as any event peculiar to a specific point in time might be causing conflictual tensions between country pairs, and hence, this might yield spurious results.

[29] A similar table to Table 6 for making Cold War and post-Cold War comparisons controlling for geographic and political factors only is reproduced in Table 6A in the Appendix. Important to notice in Table 6A is that while the impact of different legal origins weakens once we pass from Cold War to post-Cold War the effect democracy has increases. A possible explanation is that the effect of different legal origins is washed out in the post-Cold War period once more countries are democratic, hence democracy has a larger impact and underlying different legal origins do not play such a big role any more.

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Table 6. Panel Regressions, probit.

(Dependent variable: dichotomous indicator of conflict between 1946-1991 and 1992-2001; Cold War and post-Cold War Comparisons).

	(1) military factors, Cold War	**(2)** military factors, post-Cold War	**(3)** economic factors, Cold War	**(4)** economic factors, post-Cold War
Different Civilizations	.0065**	.000378	-.00986	.0175***
	(0.04)	(0.9)	(0.12)	(0.001)
# Major Powers	.0578***	.0392***	.039***	.038***
	(0.00)	(0.00)	(0.00)	(0.00)
Log Abs Diff Military Capability	.0041***	.0019	.0083***	-.00108
	(0.00)	(0.17)	(0.00)	(0.63)
Alliance Dummy	-.0133***	.0191**	-.002	-.004
	(0.001)	(0.02)	(0.77)	(0.59)
# Other Wars in t	.00024***	.000152*	.00038**	.000083
	(0.003)	(0.08)	(0.013)	(0.47)
# Peaceful Years	-.0033***	-.00199***	-.0038***	-.0017***
	(0.00)	(0.00)	(0.00)	(0.00)
Abs Diff Log pc Income			-.0101***	.00488**
			(0.00)	(0.01)
Log Bi Openness, t-4			-.0518***	-.02206**
			(0.00)	(0.022)
Log Multi Openness, t-4			.0136	.0838*
			(0.65)	(0.07)
Log Dist×Log Bi Open			.0071***	.00211*
			(0.00)	(0.071)
Log Dist×Log Multi Open			-.0027	-.0127**
			(0.46)	(0.043)
# of Observations	282061	118609	101463	48183
Standardized Magnitude(%)	21.972	1.536	-25.771	71.335

Robust p-values in parentheses; *** significant at 1%; ** significant at 5%; * significant at 10%.

Probit marginal effects are reported in all columns. For dummy variables, marginal effects are for discrete changes from 0 to 1. The standardized magnitude is the effect of a discrete change from 0 to 1 in *different civilizations dummy* as a percentage of the probability of conflict at the means of the variables. All marginal effects are multiplied by 100 for the sake of readability. In addition to the variables reported all regression columns include Contiguity, Log Geodesic Distance, Log Absolute Difference in Latitudes, Log Absolute Difference in Longitudes, Number of Landlocked Countries in the Pair, Log Product of Land Areas in sq km, Ever in Colonial Relationship, Common Colonizer, Countries were or are the Same Country, Different Legal Origins and Sum of Democracy Indexes.

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Even when we control for time fixed effects our previous results are confirmed. Over the entire sample, being part of two different civilizations increases the probability of conflict, though not significantly. Strikingly, Cold War period gives again a negative coefficient, while it is strongly positive and significant in the post-Cold War era. More precisely, during the post-Cold War period, different civilizational memberships for the two countries in a dyad substantially increases the average probability of conflict by 72.4 percent. From the results of Table 7, we can confidently say that our results are not spurious and the clash of civilizations in the aftermath of the Cold War is a robust finding.

Table 7. Time Fixed Effects, panel probit.

(Dependent variable: dichotomous indicator of conflict, Cold War, post-Cold War, Full Sample).

	(1) Cold War	**(2)** post-Cold War	**(3)** Full Sample
Different Civilizations	-.00745	.0153***	.00401
	(0.166)	(0.001)	(0.355)
Time Fixed Effects	YES	YES	YES
# of Observations	101456	48183	149639
Standardized Magnitude(%)	-23.47	72.469	12.111

Robust p-values in parentheses; *** significant at 1%; ** significant at 5%; * significant at 10%.

Probit marginal effects are reported in all columns. For dummy variables, marginal effects are for discrete changes from 0 to 1. The standardized magnitude is the effect of a discrete change from 0 to 1 in *different civilizations dummy* as a percentage of the probability of conflict at the means of the variables. All marginal effects are multiplied by 100 for the sake of readability. In addition to the variables reported all regression columns include Contiguity, Log Geodesic Distance, Log Absolute Difference in Latitudes, Log Absolute Difference in Longitudes, Number of Landlocked Countries in the Pair, Log Product of Land Areas in sq km, Ever in Colonial Relationship, Common Colonizer, Countries were or are the Same Country, Different Legal Origins, Sum of Democracy Indexes, Number of Major Powers in the Pair, Log Absolute Difference in Military Capabilities, Alliance Dummy, Number of Other Wars in Year t, Number of Peaceful Years, Absolute Difference in Log per capita Income, Log Bilateral Openness (t-4), Log Multilateral Openness (t-4), Log Distance$\times$Log Bilateral Openness, Log Distance$\times$Log Multilateral Openness.

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Casting Genetic Distance in Comparison

Index of genetic distance as a proxy for culture has recently attracted a number of researchers (Giuliano, Spilimbergo and Tonon, 2006; Guiso, Sapienza and Zingales, 2009; Spolaore and Wacziarg, 2009a, 2009b). To that end, we would like to test the sensitivity of our measures of culture against genetic distance variable and see how they fare in comparison.

Genetic distance is a summary measure of differences in allele frequencies across a range of neutral genes (or chromosomal loci). Correspondingly, the index constructed measures the genetic variance between populations as a fraction of the total genetic variance. Given genetic characteristics are transmitted throughout generations at a regular pace, genetic distance is closely linked to the times when two populations shared common ancestors. It is argued that the degree of genetic distance also reflects cultural distance for culture can be transmitted across genetically related individuals, and therefore, populations that are farther apart genealogically tend to be, on average, more different in characteristics that are transmitted with variations from parents to children.[30]

In this strand of the literature, for instance, using genetic distance as a measure of cultural similarity/dissimilarity, researchers tried to explain the differences in the level of development across countries (Spolaore and Wacziarg, 2009a), the effect of culture on the likelihood of conflict involvement of country dyads (Spolaore and Wacziarg, 2009b) or the level of trust populations have for each other (Guiso, Sapienza and Zingales, 2009).

Given the above discussion and the importance of genetic distance in recent times we deem it necessary to establish the robustness of our results to the inclusion of this variable. The genetic distance data we use are from Spolaore and Wacziarg (2009a) as the genetic distance information on populations is mapped onto countries.

In Table 8 we probe whether our indicator of different civilizations survive inclusion of genetic distance variable, and therefore, whether it explains an element of culture that is not captured by genetic distance. Genetic distance is added to the full set of control variables (coefficients not reported) in all estimations, both with and without time fixed effects. The results are prominent. Our measure of different civilizations not only

[30] For more details and the discussion on the construction of genetic distance between populations, its corresponding mapping onto countries and its cultural implications, interested reader should see Cavalli-Sforza and Feldman (1981), Cavalli-Sforza et al. (1994), Giuliano, Spilimbergo and Tonon (2006) and Spolaore and Wacziarg (2009a).

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survives inclusion of genetic distance, but it also shows a very large and significant impact on conflict involvement independently of time fixed effects. Over the entire sample, when the two countries in a dyad belong to different civilizations, they have a 31 to 35 percent increased probability of conflict than a dyad of same civilization countries. Furthermore, Huntington's thesis is affirmed one more time. The consequences of different civilizational belongings is much sharper in the post-Cold War period. A dyad of different civilizations have an almost 90 percent raised likelihood of conflict in the post-Cold War era compared to a statistically insignificant impact during the Cold War. These results show that our measure of different civilizations is robust to the inclusion of genetic distance and reflects an element of civilizational/cultural differences that is not captured by genetic distance.

Table 8. Genetic Distance in Comparison, panel probit.
(Dependent variable: dichotomous indicator of conflict, Cold War, post-Cold War, Full Sample).

	(1) Cold War	**(2)** post-Cold War	**(3)** Full Sample	**(4)** Cold War	**(5)** post-Cold War	**(6)** Full Sample
Different Civilizations	.00108	.01879***	.0115***	.000707	.02164***	.01235**
	(0.833)	(0.000)	(0.005)	(0.907)	(0.000)	(0.012)
Genetic Distance	-.000023***	-.0000171***	-.0000242***	-.0000287***	-.0000194***	-.0000295***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Time Fixed Effects	YES	YES	YES	NO	NO	NO
# Observations	101107	47449	148556	101114	47449	148563
Standardized Magnitude(%)	3.47	89.990	35.243	1.896	89.053	31.682

Robust p-values in parentheses; *** significant at 1%; ** significant at 5%; * significant at 10%.

Probit marginal effects are reported in all columns. For dummy variables, marginal effects are for discrete changes from 0 to 1. The standardized magnitude is the effect of a discrete change from 0 to 1 in *different civilizations dummy* as a percentage of the probability of conflict at the means of the variables. All marginal effects are multiplied by 100 for the sake of readability. In addition to the variables reported all regression columns include Contiguity, Log Geodesic Distance, Log Absolute Difference in Latitudes, Log Absolute Difference in Longitudes, Number of Landlocked Countries in the Pair, Log Product of Land Areas in sq km, Ever in Colonial Relationship, Common Colonizer, Countries were or are the Same Country, Different Legal Origins, Sum of Democracy Indexes, Number of Major Powers in the Pair, Log Absolute Difference in Military Capabilities, Alliance Dummy, Number of Other Wars in Year t, Number of Peaceful Years, Absolute Difference in Log per capita Income, Log Bilateral Openness (t-4), Log Multilateral Openness (t-4), Log Distance×Log Bilateral Openness, Log Distance×Log Multilateral Openness.

Alternative Measures of Culture

One can doubt the civilizational categorization of Huntington and believe that our results are biased and driven by the particular way our different civilizations indicator is constructed. We challenge such a doubt by providing additional measures of civilizational/cultural cleavages/similarities. More specifically, we use Tanja Ellingsen's "Ethnic Witches' Brew Data Set" that provides us with data on religious, linguistic and ethnic fragmentation within countries between 1945-2001.

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Ellingsen (2000) collected data on the size and name of the linguistic, religious, and ethnic dominant groups; the number of linguistic, religious, and ethnic groups; the size and name of the linguistic, religious, and ethnic minority groups as well as ethnic affinities. She has obtained information from three reference books: Handbook of the Nations, Britannica Book of the Year and Demographic Yearbook. What is particularly important for our purpose in this data set is the information on the name and proportional size of the largest and the second largest linguistic, religious, and ethnic groups. As in Gartzke and Gleditsch (2006), we have indicator variables for whether the two countries in a dyad have the same dominant religion, language and ethnicity as well as binary variables for whether a majority religion, language or ethnicity in one country is a minority group in the second country in the dyad.[31]

Table 9. Same Majority Religion and Conflict, panel probit.
(Dependent variable: dichotomous indicator of conflict, Cold War, post-Cold War, Full Sample).

	(1) Cold War	**(2)** post-Cold War	**(3)** Full Sample	**(4)** Cold War	**(5)** post-Cold War	**(6)** Full Sample
Same Majority Religion	.0048	-.00748**	-.00245	.00547	-.00819**	-.0026
	(0.269)	(0.017)	(0.450)	(0.216)	(0.012)	(0.434)
Genetic Distance				-.0000233***	-5.400e-06**	-.0000179***
				(0.000)	(0.016)	(0.000)
Time Fixed Effects	YES	YES	YES	YES	YES	YES
# Observations	101233	45557	146790	100935	45296	146231
Standardized Magnitude(%)	15.137	-71.853	-9.269	17.26	-75.903	-9.745

Robust p-values in parentheses; *** significant at 1%; ** significant at 5%; * significant at 10%.

Probit marginal effects are reported in all columns. For dummy variables, marginal effects are for discrete changes from 0 to 1. The standardized magnitude is the effect of a discrete change from 0 to 1 in *same majority religion dummy* as a percentage of the probability of conflict at the means of the variables. All marginal effects are multiplied by 100 for the sake of readability. In addition to the variables reported all regression columns include Contiguity, Log Geodesic Distance, Log Absolute Difference in Latitudes, Log Absolute Difference in Longitudes, Number of Landlocked Countries in the Pair, Log Product of Land Areas in sq km, Ever in Colonial Relationship, Common Colonizer, Countries were or are the Same Country, Different Legal Origins, Sum of Democracy Indexes, Number of Major Powers in the Pair, Log Absolute Difference in Military Capabilities, Alliance Dummy, Number of Other Wars in Year t, Number of Peaceful Years, Absolute Difference in Log per capita Income, Log Bilateral Openness (t-4), Log Multilateral Openness (t-4), Log Distance$\times$Log Bilateral Openness, Log Distance$\times$Log Multilateral Openness.

In the first three columns of Table 9 we replace our different civilizations indicator with a binary variable which equals one if the two countries in the dyad share the same majority religion. The full set of control variables (not reported coefficients) as well as time fixed effects are employed in every regression. Estimation results are highly analogous to our previous findings. Over the full sample, when the two countries share the same dominant

[31] The original data by Tanja Ellingsen runs from 1945 to 1994. We use the version of the data by Gartzke and Gleditsch (2006) and this version of the data set runs up until 2001. For more details, see Ellingsen (2000) and Gartzke and Gleditsch (2006).

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religion they face a reduced probability of conflict, though this effect is insignificant. If we look at the Cold War and post-Cold War samples, the results lead us to reaffirm our previous findings and Huntington's hypothesis as well. In the post-Cold War period, two countries with the same religion have a 71 percent lower conflict probability than two countries with different religions; whereas during the Cold War the effect of sharing the same religion is statistically insignificant.

In columns (4), (5) and (6) of Table 9 we replicate the same exercise together with the genetic distance variable. Our results do not change at all. The indicator of same majority religion survives genetic distance, and hence, in the post-Cold War period, a pair of countries with the same majority religion have 75 percent lower probability of conflict even after we control for genetic distance.

Table 10. Same Majority Language and Conflict, panel probit.

(Dependent variable: dichotomous indicator of conflict, Cold War, post-Cold War, Full Sample).

	(1) Cold War	**(2)** post-Cold War	**(3)** Full Sample	**(4)** Cold War	**(5)** post-Cold War	**(6)** Full Sample
Same Majority Language	.03046***	-.00699*	.01323**	.02051**	-.00757**	.00747
	(0.001)	(0.056)	(0.031)	(0.014)	(0.040)	(0.198)
Genetic Distance				-.000022***	-6.270e-06***	-.000017***
				(0.000)	(0.004)	(0.000)
Time Fixed Effects	YES	YES	YES	YES	YES	YES
# Observations	101233	42218	143451	100935	41964	142899
Standardized Magnitude(%)	95.098	-67.276	49.310	64.456	-70.222	27.554

Robust p-values in parentheses; *** significant at 1%; ** significant at 5%; * significant at 10%.

Probit marginal effects are reported in all columns. For dummy variables, marginal effects are for discrete changes from 0 to 1. The standardized magnitude is the effect of a discrete change from 0 to 1 in *same majority language dummy* as a percentage of the probability of conflict at the means of the variables. All marginal effects are multiplied by 100 for the sake of readability. In addition to the variables reported all regression columns include Contiguity, Log Geodesic Distance, Log Absolute Difference in Latitudes, Log Absolute Difference in Longitudes, Number of Landlocked Countries in the Pair, Log Product of Land Areas in sq km, Ever in Colonial Relationship, Common Colonizer, Countries were or are the Same Country, Different Legal Origins, Sum of Democracy Indexes, Number of Major Powers in the Pair, Log Absolute Difference in Military Capabilities, Alliance Dummy, Number of Other Wars in Year t, Number of Peaceful Years, Absolute Difference in Log per capita Income, Log Bilateral Openness (t-4), Log Multilateral Openness (t-4), Log Distance$\times$Log Bilateral Openness, Log Distance$\times$Log Multilateral Openness.

In a similar vein, we repeat in Table 10 the same analysis putting forward the "same majority language" indicator as our variable of interest. "Same majority language" is a binary variable equal to one if the two countries in a dyad speak the same dominant language. The results presented in Table 10 confirm Huntington's hypothesis one more time. In the post-Cold War period, two countries with the same majority language have 67 percent lower likelihood of conflict, while this effect is positive during the Cold War.

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In the last three columns of Table 10, we again look into whether our variable of interest survives genetic distance. The results carry over even more strongly. Two countries with the same language have a 70 percent reduced probability of conflict in the post-Cold War era after taking genetic distance into account.

Lastly, we repeat the same exercises in Table 11 using an indicator variable that takes one when the two counties in a dyad have the "same majority ethnicity." Unlike our findings on sharing majority religion and majority language, having the same dominant ethnicity does not seem to significantly affect conflict involvement of countries, especially in the post-Cold War era. Columns (1) to (3) of Table 11 show that when the two countries in a dyad share the same dominant ethnicity, they are more inclined to fight one another. Although, same dominant ethnicity variable maintains an overall positive sign, it does not survive the inclusion of genetic distance.

Table 11. Same Majority Ethnicity and Conflict, panel probit.
(Dependent variable: dichotomous indicator of conflict, Cold War, post-Cold War, Full Sample).

	(1) Cold War	**(2)** post-Cold War	**(3)** Full Sample	**(4)** Cold War	**(5)** post-Cold War	**(6)** Full Sample
Same Majority Ethnicity	.01995**	.00792	.01843**	.0124	.0053	.0001168
	(0.042)	(0.487)	(0.035)	(0.165)	(0.630)	(0.150)
Genetic Distance				-.0000229***	-.0000149***	-.000023***
				(0.000)	(0.000)	(0.000)
Time Fixed Effects	YES	YES	YES	YES	YES	YES
# Observations	99591	45319	144910	99302	45064	144366
Standardized Magnitude(%)	61.140	35.262	53.637	38.224	23.430	33.963

Robust p-values in parentheses; *** significant at 1%; ** significant at 5%; * significant at 10%.

Probit marginal effects are reported in all columns. For dummy variables, marginal effects are for discrete changes from 0 to 1. The standardized magnitude is the effect of a discrete change from 0 to 1 in *same majority ethnicity dummy* as a percentage of the probability of conflict at the means of the variables. All marginal effects are multiplied by 100 for the sake of readability. In addition to the variables reported all regression columns include Contiguity, Log Geodesic Distance, Log Absolute Difference in Latitudes, Log Absolute Difference in Longitudes, Number of Landlocked Countries in the Pair, Log Product of Land Areas in sq km, Ever in Colonial Relationship, Common Colonizer, Countries were or are the Same Country, Different Legal Origins, Sum of Democracy Indexes, Number of Major Powers in the Pair, Log Absolute Difference in Military Capabilities, Alliance Dummy, Number of Other Wars in Year t, Number of Peaceful Years, Absolute Difference in Log per capita Income, Log Bilateral Openness (t-4), Log Multilateral Openness (t-4), Log Distance$\times$Log Bilateral Openness, Log Distance$\times$Log Multilateral Openness.

From this analysis we can conclude that having the same religion or the same language has a more statistically significant and robust impact on conflict involvement compared to having the same ethnicity. Huntington's hypothesis about the clash of civilizations in the post-Cold War era is reaffirmed and our results indicate towards a link between Huntington's typology of civilizations and religious and linguistic associations between

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countries. This comes as no surprise since Huntington takes religion as the central defining characteristic of a civilization, and consequently, closely identifies the major civilizations in human history with the world's great religions.

Conclusion

As Huntington (1993b) stated, faith and family, blood and belief are what people identify themselves with and what they will fight and die for. That is why the clash of civilizations is replacing the Cold War as the central phenomenon of global politics and why a civilizational paradigm provides, better than any alternative, a useful starting point for understanding and coping with the changes going on in the world.

Though the above claim by Huntington might neglect several aspects that feed into conflictual fault lines, there is an element of truth in it as this study shows. To that end, using a rich data set, this paper provides the lacking rigorous empirical analysis of what was verbalized by Huntington. We do not only put forward various tests and specifications, but also carry out a number of alternative robustness checks. Our results are very persistent. We show that civilizational differences do matter in conflictual relations as they increase the likelihood of conflict by up to 62.8 percentage points over the period 1816-2011. More importantly, we show that civilizational differences matter even more in the post-Cold War world and country pairs that belong to different civilizations are associated with 71.3 percentage points higher conflict probability than the ones that belong to the same civilization. These results are not driven by the particular classification of civilizations and countries. For instance, among others, we provide evidence that two countries sharing the same religion in the post-Cold War period face a 71.8 percent lower probability of conflict than countries of different religions, whereas this effect is not significant during the Cold War.

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Appendix

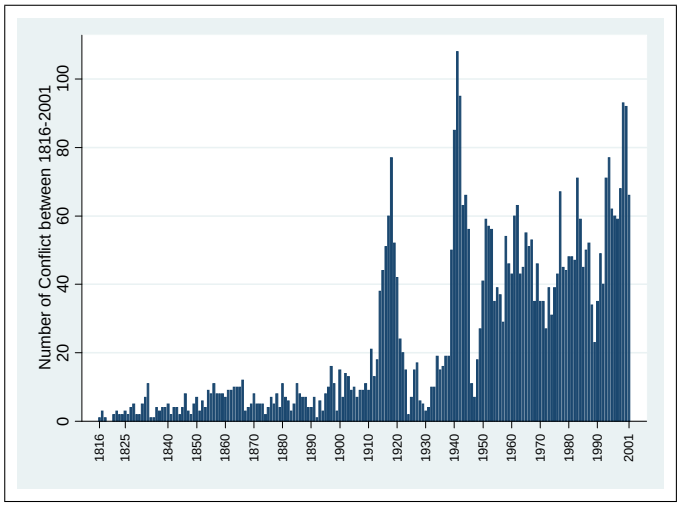

Figure 1A: Number of Conflict, 1816-2001

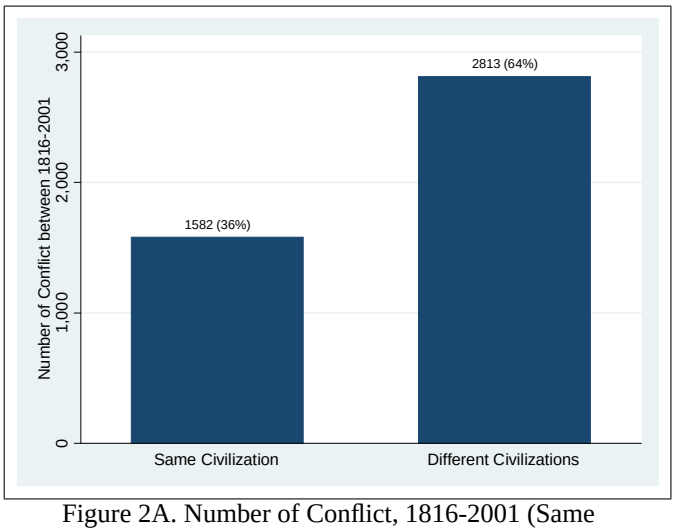

Figure 2A. Number of Conflict, 1816-2001 (Same Civilization and Different Civilizations Breakdown)

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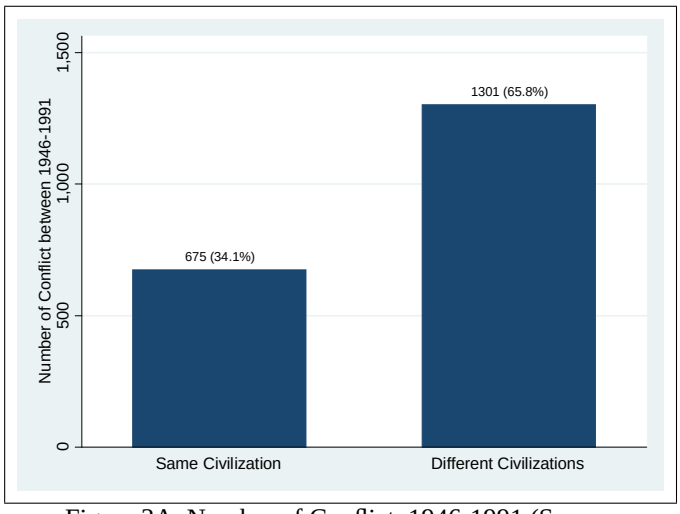

Figure 3A. Number of Conflict, 1946-1991 (Same Civilization and Different Civilizations Breakdown)

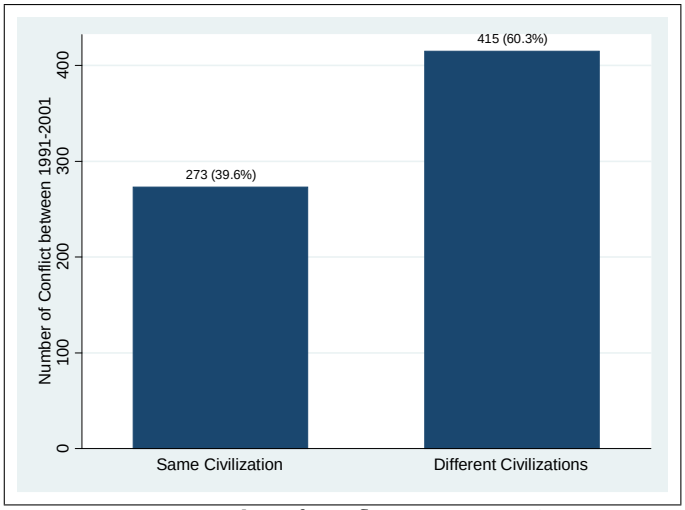

Figure 4A. Number of Conflict, 1991-2001 (Same Civilization and Different Civilizations Breakdown)

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TABLE 1A. Civilization Membership

Civilization	Country
Western	Andorra, Australia, Austria, Barbados, Belgium, Canada, Croatia, Czech Rep., Denmark, Dominica, Estonia, Finland, France, French Guiana, Germany, Greenland, Grenada, Hungary, Iceland, Ireland, Israel, Italy, Jamaica, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Netherlands, New Zealand, Norway, Papua New Guinea, Philippines, Poland, Portugal, San Marino, Slovakia, Slovenia, Solomon Islands, Spain, Sweden, Switzerland, Trinidad and Tobago, United Kingdom, United States, Vanuatu.
Sinic	China, Hong Kong, North Korea, South Korea, Taiwan, Vietnam.
Islamic	Afghanistan, Albania, Algeria, Azerbaijan, Bahrain, Bangladesh, Bosnia and Herzegovina, Brunei, Burkina Faso, Chad, Djibouti, Egypt, Eritrea, Gambia, Guinea, Guinea-Bissau, Indonesia, Iran, Iraq, Jordan, Kyrgyzstan, Kuwait, Lebanon, Libya, Malaysia, Mali, Mauritania, Morocco, Niger, Oman, Pakistan, Qatar, Saudi Arabia, Senegal, Somalia, Sudan, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, United Arab Emirates, Uzbekistan, Yemen.
Hindu	Guyana, India, Nepal.
Orthodox	Armenia, Belarus, Bulgaria, Cyprus, Georgia, Greece, Kazakhstan, Macedonia, Moldova, Romania, Russia, Serbia, Ukraine.
Latin American	Antigua and Barbuda, Argentina, Bahamas, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Rep., Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Saint Lucia, St.Vincent & Grenadines, Uruguay, Venezuela.
African	Angola, Benin, Botswana, Burundi, Cameroon, Cape Verde, Central African Republic, Comoros, Congo, Congo Dem. Rep. (Zaire), Equatorial Guinea, Gabon, Ghana, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Nigeria, Rwanda, Sao Tome and Principe, Sierra Leone, South Africa, Suriname, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe.
Buddhist	Bhutan, Cambodia, Lao People's Dem. Rep., Mongolia, Myanmar, Singapore, Sri Lanka, Thailand.
"**Lone" States**	Ethiopia, Haiti, Japan.

Source: Author's own construction based on Huntington (1998).

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TABLE 2A. Number of Conflicts within and across Civilizations between 1946-1991.

Civilizations	West	Sin	Islam	Hind	Ortho	L.Ameri	Afric	Budd	L.Stat
West	35								
	(1.7%)								
Sin	200	97							
	(10%)	(4.9%)							
Islam	387	14	241						
	(19.5)	(.7%)	(12.1%)						
Hind	4	33	52	3					
	(.2%)	(1.6%)	(2.6%)	(.15%)					
Ortho	130	41	56	0	14				
	(6.5%)	(2.0%)	(2.8%)	0	(.7%)				
L.Ameri	67	7	8	10	5	90			
	(3.3%)	(.35%)	(.4%)	(.5%)	(.25%)	(4.5%)			
Afric	29	0	32	3	2	21	127		
	(1.4%)	0	(1.6%)	(.15%)	(.1%)	(1%)	(6.4%)		
Budd	11	77	2	5	5	0	0	68	
	(.55%)	(3.8%)	(.1%)	(.25)	(.25%)	0	0	(3.4)	
L.Stat	5	28	33	0	27	7	0	0	0
	(.25%)	(1.4%)	(1.6%)	0	(1.3%)	(.35%)	0	0	0

Source: Author's estimates. Percentages are in parentheses.
Legend: West=Western, Sin=Sinic, Islam=Islamic, Hind=Hindu, Ortho=Orthodox, L.Ameri=Latin American, Afric=African, Budd=Buddhist, L.Stat=Lone States.

TABLE 3A. Number of Conflicts within and across Civilizations between 1991-2001.

Civilizations	West	Sin	Islam	Hind	Ortho	L.Ameri	Afric	Budd	L.Stat
West	10								
	(1.4%)								
Sin	30	30							
	(4.3%)	(4.3%)							
Islam	65	1	98						
	(9.4%)	(.14%)	(14.2%)						
Hind	1	0	13	0					
	(.14%)	0	(1.8%)	0					
Ortho	138	2	87	0	31				
	(20%)	(.29%)	(12.6%)	0	(4.5%)				
L.Ameri	7	0	0	1	2	28			
	(1%)	0	0	(.14%)	(.29%)	(4%)			
Afric	2	0	21	2	0	0	66		
	(.29%)	0	(3%)	(.29%)	0	0	(9.5%)		
Budd	0	3	1	1	0	0	0	10	
	0	(.43%)	(.14%)	(.14%)	0	0	0	(1.4%)	
L.Stat	10	13	5	0	6	3	1	0	0
	(1.4%)	(1.8%)	(.72%)	0	(.87%)	(.43%)	(.14%)	0	0

Source: Author's estimates. Percentages are in parentheses.
Legend: West=Western, Sin=Sinic, Islam=Islamic, Hind=Hindu, Ortho=Orthodox, L.Ameri=Latin American, Afric=African, Budd=Buddhist, L.Stat=Lone States.

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TABLE 4A. Summary Statistics

Variable	# Obs.	Mean	Std. Dev.	Min	Max
Conflict (%)	590337	.744	8.596	0	100
Different Civilizations	590337	.807	.394	0	1
Contiguity Dummy	590337	.046	.210	0	1
Log Distance	589696	8.714	.8009	4.29	9.89
Log Absolute Latitude Difference	586598	2.903	1.135	-4.09	4.64
Log Absolute Longitude Difference	586818	3.735	1.21	-4.60	5.61
# Landlocked Countries in a Dyad	586845	.347	.535	0	2
Log Product of Land Area	586845	24.30	3.077	9.86	32.76
Colonial Relationship Dummy	599328	.0159	.125	0	1
Common Colonizer Dummy	501041	.094	.291	0	1
Part of Same Polity Dummy	593424	.0107	.103	0	1
Different Legal Origins Dummy	613318	.632	.482	0	1
Sum of Democracy Indexes	490839	-.3869	10.6	-20	20
# Major Powers in a Dyad	608431	.108	.323	0	2
Log Absolute CINC Difference	589315	-5.944	2.02	-18.42	-.957
Alliance Dummy	613297	.057	.232	0	1
# Other Wars in Year t	607076	22.57	19.05	0	107
# Peaceful Years	590337	27.89	27.32	0	186
Absolute Log Income Difference	278897	2.812	2.039	.0000095	12.26
Log Bilateral Openness	225272	-6.887	2.27	-16.78	2.13
Log Multilateral Openness	225448	-1.387	.848	-10.41	8.95
Genetic Distance	709471	1070.29	810.93	0	3375
Same Religion	499039	.372	.4833	0	1
Same Language	486780	.0428	.2024	0	1
Same Ethnicity	497844	.0324	.1771	0	1

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TABLE 5A. Cross-Sectional Regressions, probit.

(Dependent variable: dichotomous indicator for whether a country pair was ever involved in a war, Cold War and post-Cold War Comparison).

	(1) Cold War period	**(2)** post-Cold War period	**(3)** Cold War period	**(4)** post-Cold War period
Different Civilizations	.096***	.0046	.076***	.0042
	(0.002)	(0.78)	(0.004)	(0.79)
Contiguity	.3509***	.0094	.313***	.0066
	(0.002)	(0.74)	(0.002)	(0.8)
Log Geodesic Distance	-.0213	-.0142	-.0202	-.012
	(0.42)	(0.26)	(0.37)	(0.3)
Log Absolute Difference	-.055***	-.0103*	-.048***	-.009
in Latitudes	(0.00)	(0.09)	(0.00)	(0.11)
Log Absolute Difference	-.0187	-.0084	-.015	-.008
in Longitudes	(0.23)	(0.17)	(0.23)	(0.17)
Number of Landlocked	-.216***	.0356***	-.181***	.034***
Countries in the Pair	(0.00)	(0.001)	(0.00)	(0.001)
Log Product of Land	.042***	.0125***	.035***	.0122***
Areas in sq km	(0.00)	(0.00)	(0.00)	(0.00)
Ever in Colonial Relationship			-.045	
			(0.48)	
Common Colonizer			-.0627	-.0092
			(0.15)	(0.64)
Countries were or are			.398*	.0408
the Same Country			(0.07)	(0.45)
Different Legal Origins			.077***	-.011
			(0.004)	(0.46)
# Obs.	15309	15309	15309	15136
Standardized magnitude(%)	111.219	19.554	107.496	18.821

Robust p-values in parentheses; *** significant at 1%; ** significant at 5%; * significant at 10%.

Probit marginal effects are reported in all columns. For dummy variables, marginal effects are for discrete changes.from 0 to 1. The standardized magnitude is the effect of a discrete change from 0 to 1 in *different civilizations dummy* as a percentage of the probability of war at the means of the variables. All marginal effects are multiplied by 100 for the sake of readability.

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TABLE 6A. Panel Regressions, probit. (Dependent variable: dichotomous indicator of conflict between1946-1991 and 1992-2001; Cold War and post-Cold War Comparisons).

	(1) geographic factors, Cold War	(2) geographic factors, post-Cold War	(3) political factors, Cold War	(4) political factors, post-Cold War
Different Civilizations	.0842***	.0522***	.0692***	.0163
	(0.00)	(0.00)	(0.00)	(0.14)
Contiguity	1.286***	.333***	1.177***	.802***
	(0.00)	(0.00)	(0.00)	(0.00)
Log Geodesic Distance	-.05***	-.0626***	-.0436***	-.0046
	(0.00)	(0.00)	(0.00)	(0.6)
Log Absolute Difference	-.061***	-.0528***	-.0724***	-.0508***
in Latitudes	(0.00)	(0.00)	(0.00)	(0.00)
Log Absolute Difference	-.0487***	-.038***	-.0638***	-.0408***
in Longitudes	(0.00)	(0.00)	(0.00)	(0.00)
Number of Landlocked	-.144***	-.0615***	-.1486***	-.046***
Countries in the Pair	(0.00)	(0.00)	(0.00)	(0.00)
Log Product of Land	.0548***	.0318***	.0554***	.0288***
Areas in sq km	(0.00)	(0.00)	(0.00)	(0.00)
Ever in Colonial Relationship			.0545*	.2439***
			(0.08)	(0.00)
Common Colonizer			-.0372**	-.0423***
			(0.02)	(0.001)
Countries were or are			.013	.1968***
the Same Country			(0.58)	(0.00)
Different Legal Origins			.106***	.0182*
			(0.00)	(0.06)
Sum of Democracy Indexes			-.00058*	-.0034***
			(0.10)	(0.00)
# of Obs.	333033	152312	282067	118614
Standardized Magnitude(%)	72.181	70.046	55.513	23.542

Robust p-values in parentheses; *** significant at 1%; ** significant at 5%; * significant at 10%.

Probit marginal effects are reported in all columns. For dummy variables,marginal effects are for discrete changes from 0 to 1. The standardized magnitude is the effect of a discrete change from 0 to 1 in different civilizations dummy as a percentage of the probability of conflict at the means of the variables. All marginal effects are multiplied by 100 for readability.

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References

[1] Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S. and Wacziarg, R. 2003. "Fractionalization." Journal of Economic Growth, 8, 155-194.

[2] Barbieri, K., Keshk, O. and Pollins, B. 2008. "Correlates of War Project Trade Data Set Codebook, Version 2.0."

[3] Barbieri, K., Keshk, O. and Pollins, B. 2009. “TRADING DATA: Evaluating our Assumptions and Coding Rules.” Conflict Management and Peace Science, Forthcoming.

[4] Bolks, S. and Stoll, R. 2003. "Examining Conflict Escalation Within the Civilizations Context." Conflict Management and Peace Science 20(2): 85–110.

[5] Bremer, S. A. 1992. "Dangerous Dyads: Conditions Affecting the Likelihood of Interstate War, 1816–1965." Journal of Conflict Resolution 36(2): 309–341.

[6] Cavalli-Sforza, L. L. and Feldman, M. W. 1981. "Cultural Transmission and Evolution." Princeton: Princeton University Press.

[7] Cavalli-Sforza, L. L., Menozzi, P. and Piazza, A. 1994. "The History and Geography of Human Genes." Princeton, New Jersey: Princeton University Press.

[8] Chiozza, G. 2002. "Is There a Clash of Civilizations? Evidence from Patterns of International Conflict Involvement, 1946–97." Journal of Peace Research 39: 711–34.

[9] Correlates of War Project. 2003. "Alliances Data, 1816-2000 Version 3.03."

[10] Correlates of War Project. 2007. "Direct Contiguity Data, 1816-2006. Version 3.1."

[11] Correlates of War Project. 2007. "Militarized Interstate Disputes Data, 1816-2001. Version 3.1."

[12] Correlates of War Project. 2007. "National Material Capabilities Data, 1816-2007. Version 4.0."

[13] Correlates of War Project. 2008. “State System Membership List, 1816-2004. Version 2008.1.”

[14] Correlates of War Project. 2008. "Trade Data Set, 1870-2006. Version 2.0."

[15] Correlates of War Project. 2011. "COW Wars Data, 1816-2007. Version 4.0."

[16] Easterly, W. and Levine, R. 1997. "Africa’s Growth Tragedy: Policies and Ethnic Divisions." The Quarterly Journal of Economics, Vol. 112, No. 4 (Nov.), 1203-1250.

[17] Ellingsen, T. 2000. "Colorful Community or Ethnic Witches’ Brew? Multiethnicity and Domestic Conflict during and after the Cold War." Journal of Conflict Resolution, 44(2), 228-249.

[18] Fearon, J. D. 2003. "Ethnic and Cultural Diversity by Country." Journal of Economic Growth, 8, 195-222.

[19] Fearon, J. and Laitin, D. 2003. "Ethnicity, Insurgency, and Civil War." American Political Science Review, 97(1): 75-90.

[20] Fukuyama, F. 1992. "The End of History and the Last Man." Free Press.

[21] Garcia-Montalvo, J. and Reynal-Querol, M. 2002. "Why Ethnic Fractionalization? Polarization, Ethnic Conflict and Growth." Mimeo, Universitat Pompeu Fabra, September.

[22] Garfinkel, M. R. and Skaperdas, S. 2006. "Economics of Conflict: An Overview." in

Tesi di dottorato ""Essays in Political and Institutional Economics""
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K. Hartley and T. Sandler (eds) Handbook of Defense Economics, Volume 2, North Holland, Amsterdam.

[23] Gartzke, E. and Gleditsch, K. S. 2006. “Identity and Conflict: Ties that Bind and Differences that Divide.” European Journal of International Relations, 12(1): 53-87.

[24] Ghosn, F. and Bennett, S. 2003. "Codebook for the Dyadic Militarized Interstate Incident Data, Version 3.10."

[25] Gibler, D. M. 2009. "International Military Alliances from 1648 to 2008." Washington: Congressional Quarterly Press.

[26] Gibler, D. M. and Sarkees, M. 2004. “Measuring Alliances: The Correlates of War Formal Interstate Alliance Data set, 1816-2000.” Journal of Peace Research 41(2): 211-222.

[27] Ghosn, F., Palmer, G. and Bremer, S. 2004. "The MID3 Data Set, 1993–2001: Procedures, Coding Rules, and Description." Conflict Management and Peace Science 21:133-154.

[28] Giuliano, P., Spilimbergo, A. and Tonon, G. 2006. “Genetic, Cultural and Geographical Distances.” IZA Discussion Paper No. 2229.

[29] Gleditsch, N. P. and Singer, J. D. 1975. "Distance and International War, 1816-1965." in Proceedings of the International Peace Research Association (IPRA) Fifth General Conference (Oslo: IPRA): 481-506.

[30] Gochman, C. S. 1991. "Interstate Metrics: Conceptualizing, Operationalizing, and Measuring the Geographic Proximity of States since the Congress of Vienna." International Interactions 17 (1): 93-112.

[31] Guiso, L., Sapienza, P. and Zingales, L. 2009. "Cultural Biases in Economic Exchange." The Quarterly Journal of Economics, 124 (3): 1095-1131.

[32] Head, K. and Mayer, T. 2002. "Illusory Border Effects: Distance Mismeasurement Inflates Estimates of Home Bias in Trade." CEPII, Working Paper No 2002-01.

[33] Henderson, E., A. 1997. "Culture or Contiguity? Ethnic Conflict, the Similarity of States, and the Onset of War, 1820–1989." Journal of Conflict Resolution 41(5): 649–68.

[34] Henderson, E., A. 1998. "The Democratic Peace through the Lens of Culture, 1820–1989." International Studies Quarterly 42(3): 461–84.

[35] Henderson, E., A. and Tucker, R., M. 2001. "Clear and Present Strangers: The Clash of Civilizations and International Conflict." International Studies Quarterly 45: 317–38.

[36] Huntington, S., P. 1993a. "The Clash of Civilizations?." Foreign Affairs 72(3): 22-49.

[37] Huntington, S., P. 1993b. "If Not Civilizations, What? Paradigms of the Post-Cold War World." Foreign Affairs 72(5): 186–94.

[38] Huntington, S., P. 1998. "The Clash of Civilizations and the Remaking of the World Order." Simon & Schuster Ltd. West Garden Place Kendal Street London W2 2AQ.

[39] Huntington, S., P. 2000. "Try Again: A Reply to Russett, Oneal and Cox." Journal of Peace Research 37(5): 609–10.

[40] Jakobsen, J. and Jakobsen, T., G. 2010. "Birds of a Feather Flock Apart? Testing the Critique of the Clash of Civilizations Thesis." Journal of Peace, Conflict and Development, Issue.15.

Tesi di dottorato ""Essays in Political and Institutional Economics""
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Sono comunque fatti salvi i diritti dell'università Commerciale Luigi Bocconi di riproduzione per scopi di ricerca e didattici, con citazione della fonte.

[41] La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R. 1999. "The Quality of Government." Journal of Law, Economics and Organization 15(1), 222-279.

[42] Levy, G. and Razin, R. 2004. “It Takes Two: An Explanation for the Democratic Peace.” Journal of the European Economic Association, 2 (1), 1–29.

[43] Martin, P., Mayer, T. and Thoening, M. 2008. "Make Trade Not War?" Review of Economic Studies, 75: 865-900.

[44] Mauro, P. 1995. "Corruption and Growth." The Quarterly Journal of Economics, Vol. 110, No. 3 (Aug.), 681-712.

[45] Mungiu-Pippidi, A. and Mindruta, D. 2002. "Was Huntington Right? Testing Cultural Legacies and the Civilization Border." International Politics, Vol. 39, No. 2, pp. 193-213.

[46] Norris, P. and Inglehart, R. 2002. "Islamic Culture and Democracy: Testing the Clash of Civilizations Thesis." Comparative Sociology, 1(3): 235-263.

[47] Russett, B., M., Oneal, J., R. and Cox, M. 2000. "Clash of Civilizations, or Realism and Liberalism D‘ej´a Vu?" Journal of Peace Research, 37(5): 583–608.

[48] Sarkees, Meredith Reid and Wayman, Frank. 2010. "Resort to War: 1816 - 2007." CQ Press.

[49] Small, M. and Singer, J., D. 1969. "Formal Alliances, 1815-1965: An Extension of the Basic Data." Journal of Peace Research 6:257-282.

[50] Singer, J. D. 1987. "Reconstructing the Correlates of War Dataset on Material Capabilities of States, 1816-1985." International Interactions, 14: 115-32.

[51] Singer, J., D. and Small, M. 1966. "Formal Alliances, 1815-1939." Journal of Peace Research 3:1-31.

[52] Singer, J., D., Bremer, S. and Stuckey, J. 1972. "Capability Distribution, Uncertainty, and Major Power War, 1820-1965." in Bruce Russett (ed) Peace, War, and Numbers, Beverly Hills: Sage, 19-48.

[53] Spolaore, E. and Wacziarg, R. 2009. “The Diffusion of Development.” The Quarterly Journal of Economics, 124 (2): 469-529.

[54] Spolaore, E. and Wacziarg, R. 2010. "War and Relatedness." NBER Working Paper Series, Working Paper 15095.

[55] Stinnett, Douglass, M., Jaroslav Tir, Philip Schafer, Paul F. Diehl, and Charles Gochman. 2002. "The Correlates of War Project Direct Contiguity Data, Version 3." Conflict Management and Peace Science 19 (2):58-66.

[56] Treisman, D. 2000. "The Causes of Corruption: A Cross-national Study." Journal of Public Economics, 76 (3), 399–457.

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2 Economic Clash? The Role of Cultural Cleavages in Bilateral Trade Relations

Abstract

Using a theory based gravity equation, we first show that cultural dissimilarity (similarity) negatively (positively) affects bilateral imports of countries. More importantly, we examine Huntington's the *Clash of Civilizations* hypothesis and provide evidence that the impact of cultural heterogeneity on trade flows is far more accentuated in the post-Cold War period than during the Cold War, a result that confirms Huntington's thesis from an economic standpoint. In the post-Cold War period, two countries that belong to different civilizations have 41 percent lower mean imports than those of the same civilization, whereas this effect is insignificant during the Cold War. Alternatively, in the post-Cold War epoch, the average bilateral imports of a country pair sharing the same majority religion, ethnicity and language are 76 percent higher than those that do not share the same heritages, whereas this effect is not significant in the Cold War era.

JEL Classification: F1, Z10.

Keywords: civilizations, culture, economic clash, trade.

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Introduction

There is a widespread agreement on the importance of the role culture plays in economic interactions (Felbermayr and Toubal, 2010; Guiso et al., 2009; Rauch and Trindade, 2002). In this context, culture is considered to be a source of informational cost and/or a source of uncertainty that acts as a barrier in trade relations of countries. In this paper, we feed into this line of discussion and scrutinize the impact of civilizational/cultural dissimilarity/similarity on bilateral trade across countries and across time periods.

The first contribution of this study is to test whether cultural dissimilarity between countries is, by and large, a trade barrier. We do that by estimating a theory based gravity model of international trade and by using a comprehensive set of cultural variables that allow us to look at different aspects of culture. We start off with deriving our empirical specification from the well-established theory of gravity equations (see, for instance, Anderson and Van Wincoop, 2003; Baldwin and Taglioni, 2007). Subsequently, using data on bilateral imports from 1950 to 2006 as well as Huntington's (1998) typology of civilizations, we provide evidence that when two countries in a dyad are members of different civilizations their mean imports are up to 34 percent lower than that of two countries of the same civilization. Furthermore, we extend the analysis using Ellingsen's measure of religious, ethnic and linguistic fragmentation within countries. This data set provides us with majority religious groups, majority ethnic groups and majority linguistic groups in countries between 1945-1994[32], and hence, allows us to examine whether sharing a dominant cultural heritage such as religion, ethnicity or language has an impact on countries trade relations. We show that although the effect of sharing the same religion on bilateral trade flows is overall positive, it does not maintain a persistent significance. On the other hand, when two countries in a dyad share the same ethnicity or the same language their trade relations are strongly improved upon. While two countries with the same dominant ethnicity have 38 percent higher mean imports, this figure increases to 58 percent for two countries sharing the same dominant language.

Parallel to the fact that this paper adds to the discussion on the relationship between culture and trade, its main contribution lies in a more specific issue. We examine Huntington's "The Clash of Civilizations?" hypothesis from an economic point of view. In his much acclaimed thesis, Huntington (1993a, 1993b, 1998, 2000) claims that the great divisions among humankind and the dominating source of conflict in the post-Cold War era will be cultural. He furthers his predictions by stating that the violent struggles

[32] The original data by Ellingsen (2000) have been extended up until 2001 by Gartzke and Gleditsch (2006).

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among peoples will result as a consequence of the fault lines between civilizations at the micro level; however, at the macro level, states from different civilizations will compete for economic and political power (Huntington, 1993). Although the Clash of Civilizations in the post-Cold War hypothesis enticed a number of authors into testing it for conflicts and battles between countries (Chiozza, 2002; Gokmen, 2011; Henderson, 1997, 1998; Henderson and Tucker, 2001; Russett et al., 2000), the fact that Huntington's predictions also indicated an economic clash among countries remained overlooked and no author ever put it into rigorous testing. This is exactly the aim of the present paper. We probe Huntington's projections of an economic clash in the post-Cold War era from an economic standpoint. Our findings are in support of the Clash of Civilizations thesis. We provide evidence suggesting that there is a strong surge in economic clash in terms of trade relations across countries in the post-Cold War era compared to the Cold War era. Two countries that belong to different civilizations have 41 percent reduced mean imports in the post-Cold War period compared to two countries of the same civilization, whereas this effect is insignificant during the Cold War. Alternatively, in the post-Cold War epoch, the average bilateral imports of a country pair sharing the same majority religion, the same majority ethnicity and the same majority language are 76 percent higher than a pair of countries that do not share the same heritages, whereas this effect is not significant in the Cold War era.

Our results are robust to alternative procedures of critical evaluation. Unlike some existing studies (Felbermayr and Toubal, 2010; Giuliano et al., 2006; Guiso et al., 2009; Rauch and Trindade, 2002), the data set we use not only contains European countries or a subset of the world, but the entire range of world countries. Moreover, we are careful to control for a large array of measures of geographic barriers as well as historical and policy related determinants of trade relations. One of the novelties of this paper compared to the existing geographic barriers literature is the use of terrain ruggedness as a barrier to trade. We show that augmented levels of terrain ruggedness strongly reduces mean imports between countries. Moreover, we include origin and destination fixed effects to account for the multilateral resistance terms as well as year fixed effects. We also cluster standard errors at the country pair level.

Additional sensitivity analysis are carried out to deal with the degree of sensitivity of our results to the inclusion of genetic distance into the regressions as an alternative measure of cultural distance, to taking into account zero-trade flows and to cross-sectional analyses. First, we show that our measures of culture survive the genetic distance variable, which means that we capture an element of culture that is not captured by genetic distance. Second, the evidence provided does not suffer from the omission of zero-trade

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flows and the conclusions still hold even after zero-trade flows are incorporated into the estimations. Third, cross-sectional analysis, by and large, props up previous findings. One cue to derive from cross-sectional analysis is that despite the general consensus on the end of the Cold War being 1991, the evidence suggests that the *de facto* end of the Cold War was somewhat earlier, between 1985-1990.

The paper proceeds as follows. Section II delivers a brief outline of where this study stands in the literature. Section III lays out the methodology and describes the data. Section IV provides baseline and main estimation results. Section V tests Huntington's "The Clash of Civilizations?" hypothesis. Section VI challenges the sensitivity and robustness of our results. Finally, Section VII concludes.

Related Literature

This study is part of the literature in political science on the *Clash of Civilizations* thesis. This strand of literature focused on militarized disputes aspect of the thesis and completely ignored what the economic implications could be. For instance, Russett et al. (2000) and Henderson and Tucker (2001) assess the incidents of militarized interstate disputes between countries during the periods 1950-92 and 1816-1992, respectively. They find that such traditional realist influences as contiguity, alliances and relative power as well as liberal influences of joint democracy and interdependence provide a much better account of interstate conflict involvement and that intercivilizational dyads are less, and not more, conflict prone. However, Huntington (2000) reacted to such studies criticizing time periods and claiming his predictions are valid in the post-Cold War era. As such, on a larger data set with a better coverage of the post-Cold War era, Gokmen (2011) provides evidence that even after controlling for geographic, political, military and economic factors, being part of different civilizations in the post-Cold War period brings about 71.2 percentage points higher probability of conflict than belonging to the same civilization, whereas it reduces the probability of conflict by 25.7 percentage points during the Cold War.

In addition, this paper substantially contributes to the literature on trade and culture (see, for instance, Felbermayr and Toubal, 2010; Giuliano et al., 2006; Guiso et al., 2009; Melitz, 2008; Rauch and Trindade, 2002). Felbermayr and Toubal (2010) establish a correlation between culture and trade using scores from European Song Contest as a proxy for cultural proximity. Giuliano et al. (2006) question the validity of genetic distance as a proxy for cultural distance in explaining trade relations and show

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that genetic distance only captures geographic barriers that are reflected in transportation costs across Europe. Guiso et al. (2009), on the other hand, show that bilateral trust between pairs of European countries leads to higher trade between them. Melitz (2008) disentangles the channels of linguistic commonality and finds that ease of communication facilitates trade rather through the ability to communicate directly than through translation. Lastly, on a subset of world countries, Rauch and Trindade (2002) show the importance of ethnic Chinese networks in international trade by expediting matches between buyers and sellers and by generating better contract enforcement for international transactions.

This study is also part of the vast literature attempting to explain bilateral trade flows using gravity models. Gravity equation is one of the most successful in empirical economics. Simply put, it explains bilateral international trade flows with GDP, distance, and other factors that conduce to trade barriers. Despite several attempts to theoretically justify gravity equations (Anderson, 1979; Anderson and Van Wincoop, 2003; Baldwin and Taglioni, 2007; Bergstrand, 1985, 1989, 1990), its success lies in its strongly consistent empirical findings. There is a wide range of empirical studies investigating the relationship between international trade flows and border effects (McCallum, 1995), internal or/and external conflict (Blomberg and Hess, 2006; Glick and Taylor, 2010; Martin et al., 2008; Rohner et al., 2011), currency unions (Glick and Rose, 2002; Rose, 2000; Rose and van Wincoop, 2001), General Agreements on Tariffs and Trade (GATT)/ World Trade Organization (WTO) (Rose, 2004), security of property rights and the quality of institutions (Anderson and Marcouiller, 2002; Berkowitz et al., 2006; de Groot et al., 2004; Nunn, 2007).[33]

Lastly, it is important to note that the recognition of the influence of cultural factors on social and economic phenomena is not new.[34] However, the curiosity in the field has been reignited only recently. In that respect, this study is partially related to a growing strand of literature on the impact of culture and institutions on social, political and economic outcomes (Algan and Cahuc, 2007; Barro and McCleary, 2003; Botticini and Eckstein, 2005; Fernandez and Fogli, 2007; Giuliano, 2007; Guiso et al., 2003, 2004, 2008a, 2008b; Ichino and Maggi, 2000; Knack and Keefer, 1997; Spolaore and Wacziarg, 2009a, 2009b; Tabellini, 2007, 2008a, 2008b).[35]

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[33] For a recent survey of the literature on trade costs, see Anderson and Van Wincoop (2004). Anderson (2011) also provide a review of the recent developments in the gravity models literature.

[34] Early seminal examples are Banfield (1958), Putnam (1993) and Weber (1958).

[35] This list is not meant to be exhaustive. See, also, Fernandez (2007) and Guiso et al. (2006) for comprehensive surveys of the literature on the relation between culture and economic outcomes.

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Methodology and Data

In this section, we first lay out the theoretical set up, and accordingly, derive the empirical specification to be estimated. Subsequently, we give a description of the data set used in the analysis.

Methodology

One of the first authors who provided clear microfoundations for the gravity model is Anderson (1979).[36] More recently, Anderson and Van Wincoop (2003) showed that most of the estimated gravity equations do not have a theoretical foundation and, by providing a theoretical framework that can be easily estimated, the authors reestablished the validity of the theory . With their theoretical framework they also facilitated the estimation of key parameters in a theoretical gravity equation relating bilateral trade to size, to bilateral trade barriers and to multilateral resistance terms. Below we provide a sketch of the theoretical framework for we want to stay as close to the theory as possible when it comes to estimation. From the following theoretical setup we derive an empirical specification. What follows is largely based on Anderson and Van Wincoop (2003, 2004) and Baldwin and Taglioni (2007).

Assume only one single differentiated good is produced in each country. Preferences are of constant elasticity of substitution (CES) functional form. Let m_{ij} be the consumption by country j consumers of goods imported from country i. Accordingly, consumers in country j maximize:

$$\left[\sum_i \beta_i^{(1-\sigma)/\sigma} m_{ij}^{(\sigma-1)/\sigma}\right]^{\sigma/(\sigma-1)} \tag{2.1}$$

subject to the budget constraint:

$$\sum_i p_{ij} m_{ij} = Y_j \tag{2.2}$$

where σ is the elasticity of substitution between goods, β_i is a positive distribution

[36] Bergstrand (1985) is another early attempt to theoretically justify gravity equations.
Anderson (1979) provides a theoretical foundation for the gravity model under perfect competition based on constant elasticity of substitution (CES) preferences and goods that are unique to their production origin and are imperfectly substitutable with other countries' goods. Further theoretical extensions- for instance, Bergstrand (1989, 1990)- have preserved the CES preference structure and added monopolistic competition or a Heckscher-Ohlin structure.

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parameter, Y_j is the nominal expenditure of country j on imported goods, and p_{ij} is the price of country i goods inside the importing country j, also called the "landed price."

Then, from the maximization problem, the nominal import expenditure on country i good is given as a function of relative prices and income level:

$$p_{ij}m_{ij} = \left[\frac{\beta_i p_{ij}}{P_j}\right]^{(1-\sigma)} Y_j \tag{2.3}$$

where P_j is country $j's$ CES price index, that is:

$$P_j = \left[\sum_i (\beta_i p_{ij})^{(1-\sigma)}\right]^{1/(1-\sigma)} \tag{2.4}$$

Prices differ among partner countries due to trade costs. The landed price in country j of country i good is linked to the exporter's supply price, p_i, and trade costs, τ_{ij}. Exporter in country i passes the bilateral trade costs on to the importer via the following pass-through equation:

$$p_{ij} = p_i \tau_{ij} \tag{2.5}$$

which renders the price index as follows: $P_j = \left[\sum_i (\beta_i p_i \tau_{ij})^{(1-\sigma)}\right]^{1/(1-\sigma)}$. τ_{ij} is a factor that reflects all trade costs, natural and man-made, between country i and country j. In addition to the transportation costs, these trade costs might reflect information costs, legal costs, regulatory and institutional costs, cost of business norms and all the remaining costs that altogether accrue up to bilateral trade barriers. This is where we see our cultural variable come into play as one of the bilateral trade barriers.

Denoting M_{ij} the value of imports, equation (2.3) combined with the pass-through equation of exporter's cost, (2.5), yields:

$$M_{ij} = \left[\frac{\beta_i p_i \tau_{ij}}{P_j}\right]^{(1-\sigma)} Y_j \tag{2.6}$$

Imposing market clearance guarantees that the total income from exports of country i should be equal to the sum of import expenditure on good i in each and every market. In symbols:

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$$Y_i = \sum_j M_{ij} \tag{2.7}$$

which we can express as follows using the import expenditure equation, (2.6), for each country j :

$$Y_i = (\beta_i p_i)^{(1-\sigma)} \sum_j \left(\frac{\tau_{ij}}{P_j}\right)^{(1-\sigma)} Y_j, \forall i \tag{2.8}$$

If we solve for $\{\beta_i p_i\}^{(1-\sigma)}$, after multiplying both sides of equation (2.8) by world nominal income $\overline{Y} = \sum_i Y_i$, we get:

$$\{\beta_i p_i\}^{(1-\sigma)} = \frac{Y_i}{\overline{Y}\Omega_i^{1-\sigma}} \tag{2.9}$$

where $\Omega_i \equiv \left[\sum_j \left(\frac{\tau_{ij}}{P_j}\right)^{(1-\sigma)} \lambda_j\right]^{1/(1-\sigma)}$ and $\lambda_j \equiv \frac{Y_j}{\overline{Y}}$.

Using above equation (2.9) and substituting it into equation (2.6) we can acquire the value of imports as:

$$M_{ij} = \frac{Y_i Y_j}{\overline{Y}} \left(\frac{\tau_{ij}}{\Omega_i P_j}\right)^{(1-\sigma)} \tag{2.10}$$

This is our first-pass gravity equation. We impose that under symmetry $(\tau_{ij} = \tau_{ji})$ it can be shown that $\Omega_i = P_i$. Then, we can rearrange terms to make our gravity equation look similar to the gravitational force equation:[37]

$$M_{ij} = G\frac{Y_i Y_j}{\tau_{ij}^{\sigma-1}} \tag{2.11}$$

where $G \equiv \frac{1}{\overline{Y}} \left(\frac{1}{P_i P_j}\right)^{(1-\sigma)}$.

Our final expression of the gravity equation relates bilateral imports positively to the size

[37] A reminder for the reader of the law of gravity:

$$Gravitational\ Force = G\frac{M_i M_j}{distance_{ij}^2}$$

where M_i and M_j are the masses of the two objects; $distance_{ij}$ is the distance between them and G is the gravitational constant.

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of the countries and negatively to the trade barriers between countries (since $\sigma > 1$). Bilateral trade barriers, τ_{ij}, are also referred to as "bilateral resistance". As mentioned earlier, one of the bilateral resistance terms is our variable of cultural dissimilarity/similarity between countries. Moreover, it is important to notice that the G term bears the price indices of the two countries. Although, P_i and P_j are price indices in the model, they cannot be interpreted as price levels in general. These unobservable variables should be better thought of as nonpecuniary trade costs a country has with all its trading partners. Hence, P_i and P_j represent average trade barriers of country i and country j, respectively, which we refer to as "multilateral resistance" terms following Anderson and Van Wincoop (2003).[38]

A common practice in the empirical literature is to work with the average of the two-way imports, the average of country i imports to country j and country j imports to country i. With no reference to the theory, averaging is done before log-linearizing, instead of after. This is a simple, though common, error, and, as shown by Baldwin and Taglioni (2007), it leads to biased estimates, especially so for countries with unbalanced trade.

Fortunately, it is easy to see what theory has to suggest. Let us multiply both sides of equation (2.11) by the value of imports from j to i, M_{ji}. Taking the geometric average of both sides, together with the symmetry of bilateral trade barriers assumption $(\tau_{ij} = \tau_{ji})$, yields:

$$\sqrt{M_{ij}M_{ji}} = \frac{Y_i Y_j}{\overline{Y}} \tau_{ij}^{1-\sigma} \left(P_i P_j\right)^{\sigma-1} \tag{2.12}$$

It is important to notice that theoretical gravity equation requires estimation of the average of the logs of unidirectional flows, rather than the log of the average. Therefore, a log-linearized version of equation (2.12) gives us the empirical counterpart of the gravity equation that we are going to use throughout:

$$\log \sqrt{M_{ij}M_{ji}} = -\log \overline{Y} + \log Y_i Y_j + (1-\sigma)\log \tau_{ij} + (\sigma-1)\log P_i P_j \tag{2.13}$$

One last pending issue before we can carry out estimations is how to treat multilateral resistance terms. Multilateral resistance terms are unobservable, however, their omission might lead to biased estimates as they are a function of bilateral resistance terms. To rem-

[38] Some empirical papers try to account for multilateral resistance by including a remoteness variable that is intended to reflect the average distance of country i from all trading partners other than country j. Anderson and Van Wincoop (2003) completely discard remoteness variables as they are entirely disconnected from the theory.

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edy this problem, Anderson and Van Wincoop (2003) suggest that multilateral resistance terms can be accounted for with country-specific dummies in order to get consistent estimates. Subsequently, Feenstra (2002) show that an estimation strategy with exporting and importing country fixed effects produces consistent estimates of the average border effect across countries. Hence, our estimation strategy is to replace multilateral resistance terms with country fixed effects. Finally, we have our empirical specification that is a log-linearized version of equation (2.12) together with importing country, exporting country and time fixed effects.[39]

Our focus in estimation is on the cultural barriers to trade, among others, for we deem such barriers as one of the most important trade barriers for the question at hand. Cultural variables reflect business norms, customs, beliefs, trust and information costs and they accrue up to bilateral barriers to trade and, in turn, might impede trade relations of countries. For expository simplicity, we disaggregate the bilateral trade barriers term and write our variable of interest -namely, civilizational/cultural heterogeneity/similarity- separately from other bilateral trade barriers. Hence, we restate our empirical specification that takes the following final form:

$$\log Imports_{ijt} = a + \theta \log Y_{it}Y_{jt} + \gamma C_{ij} + \alpha_k \tau_{kijt} + R_i + R_j + Year_t + \epsilon_{ijt} \quad (2.14)$$

where $Imports_{ijt}$ is the average (geometric) imports between countries i and j; a is a constant; $Y_{it}Y_{jt}$ is product of GDPs of the two countries assuming GDP is a proxy for expenditure on traded goods (Baldwin and Taglioni, 2007); C_{ij} is our variable of interest, that is a binary variable that captures civilizational/cultural heterogeneity/similarity across country dyads; τ_{kijt} represents all of the k control variables we account for as bilateral trade barriers other than culture; R_i is exporting country fixed effects; R_j is importing country fixed effects; $Year_t$ is yearly time fixed effects; and ϵ_{ijt} is the unaccounted-for error term.[40]

Note that a more befitting estimation strategy should also allow for, when appropriate, dyad fixed effects. Nevertheless, we cannot make use of dyad fixed effects as our variable of interest is either entirely time-invariant or has very little time variation. In order to be able to apply first-differencing or fixed-effects estimation methods we need each explanatory variable to change over time. Given that our main variable of interest is time-invariant, this methodology is not applicable. Therefore, using dyad fixed effects

[39] More discussion on time fixed effects follows below in Section II.B. Data.

[40] A small difference between what theory suggests and our empirical specification is that we allow for non-unitary income elasticities.

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would wash away our variable of interest or would yield misleading estimates (Baltagi and Khanti-Akom, 1990).

Data

Measure of Trade. Measures of dyadic imports from country i to country j as well as imports from country j into country i are acquired from Correlates of War Project International Trade Data Set Version 2.01.[41] Within this data set, the majority of the post-WWII data were obtained from the International Monetary Fund's Direction of Trade Statistics (2007 CD-ROM Subscription and hard copy versions for various years). These data were supplemented with data from Barbieri, Keshk and Pollins (2005), Barbieri's International Trade Dataset, Version 1.0 (Barbieri, 2002), and data from the Republic of China (ROC), Bureau of Foreign Trade.[42]

Bilateral import flows and income variables are measured in current US Dollars (millions). Usage of real income variables, instead, would require us to deflate nominal trade values as well. Unfortunately, good price indices for bilateral trade flows are often unavailable. Hence, what most authors do is to deflate the nominal trade values using some price index for the U.S. This inappropriate deflation of nominal trade values is a common mistake that biases the results (Baldwin and Taglioni, 2007). As suggested by Baldwin and Taglioni (2007), this problem can be overcome by including time dummies. Time dummies will account for some of the proper conversion factor between U.S. dollars in different years, and hence, will reduce the bias. Moreover, time-fixed effects allow the intercept to vary across periods to account for different distributions in different time periods, which takes care of time-varying trends.

Measure of Civilizations/Culture. 179 countries are classified as members of various civilizations. As described in Gokmen (2011) and in Huntington (1998), these civilizations are Western, Sinic, Islamic, Hindu, Orthodox, Latin American, African, Buddhist and "Lone" States. The classification and the construction of civilization membership is based on Huntington (1998). Accordingly, each country is assigned to a civilization.[43]

Furthermore, country dyads are formed by pairing each country with one another, which

[41] This data set is available at http://www.correlatesofwar.org/.

[42] For more details, see Barbieri et. al. (2008, 2009). This data set runs between 1870-2006, though with a considerable number of missing values for early years. This is not a source of concern for us as we use the part of the data for the period 1950 on given our income data also start from the year 1950.

[43] See Gokmen (2011) for the details of country specific civilizational memberships and a more detailed discussion on Huntington's thesis of clash of civilizations. Table 1A in the appendix presents the list of countries together with the corresponding civilizations.

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resulted in 15931 dyads. To indicate civilizational heterogeneity within a dyad we construct a variable labeled "Different Civilizations" denoting whether a pair of countries belong to different civilizations. This variable is coded as one if in a dyad the two countries i and j belong to different civilizations and as zero if both countries belong to the same civilization. Out of 15931 country-pairs, 2875 pairs are formed of countries belonging to the same civilization and 13056 pairs belonging to different civilizations.

As a second measure of civilizational/cultural cleavages/similarities we use Tanja Ellingsen's 'Ethnic Witches' Brew Data Set' that provide us with data on religious, linguistic and ethnic fragmentation within countries between 1945-2001.[44] Ellingsen (2000) collected data on the size and name of the linguistic, religious, and ethnic dominant group; the number of linguistic, religious, and ethnic groups; the size and name of the linguistic, religious, and ethnic minority group as well as ethnic affinities. She has obtained information from three reference books: Handbook of the Nations, Britannica Book of the Year and Demographic Yearbook. What is particularly important for our purpose in this data set is the information on the name and proportional size of the largest and the second largest linguistic, religious, and ethnic group. As in Gartzke and Gleditsch (2006), we have indicator variables for whether the two countries in a dyad have the same dominant religion, language and ethnicity as well as binary variables for whether a majority religion, language or ethnicity in one country is a minority group in the second country in the dyad.

Other Determinants of Trade. GDP and GDP per capita values are from Penn World Tables Version 7.0.[45] Both GDP (in million dollars) and GDP per capita (in dollars) measures are in current dollars due to the justifications above.

Geographic barriers are proxies for transportation as well as information costs. Correspondingly, we have a range of geographic metrics such as contiguity variable that takes value one if there is any sort of land or water contiguity between two countries in a pair, zero otherwise.[46] Additional geographic distance metrics such as the measure of the great circle (geodesic) distance between the major cities of the countries[47], latitudinal and longitudinal distance as well as the indicators of geographic isolation and geographic barriers such as number of landlocked countries in a dyad, the land area and

[44] The original data by Tanja Ellingsen runs from 1945 to 1994. We use the version of the data by Gartzke and Gleditsch (2006) and this version of the data set runs up until 2001. For more details, see Ellingsen (2000) and Gartzke and Gleditsch (2006).

[45] Available at http://pwt.econ.upenn.edu/php_site/pwt_index.php. The data are available for 189 countries and territories between 1950-2009 in current as well as constant dollars.

[46] For contiguity data we use Correlates of War Project, Direct Contiguity Data, 1816-2006, Version 3.1 (Stinnett et al., 2002). See also Gochman (1991) for additional details.

[47] See Head and Mayer (2002) for details.

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the internal distance of the countries are accounted for.[48] We also used the number of islands in a dyad as an additional geographic barrier.[49]

As suggested by Nunn and Puga (2011), geographical ruggedness is an economic handicap, making it expensive to transport goods. With this in mind, we improve our measure of geographic barriers by including a measure of terrain ruggedness. To our knowledge we are the first to make use of terrain ruggedness as a barrier to trade.[50] Nunn and Puga (2011) construct an index of terrain ruggedness for countries using the method originally devised by Riley, DeGloria and Elliot (1999). The ruggedness index calculation takes a point on the Earth's surface and calculates the difference in elevation between this point and the points in each one of the eight major directions (North, Northeast, East, Southeast, South, Southwest, West, and Northwest).[51]

To control for historical, political and institutional links we include dummy variables for whether the countries in a dyad have the same official language; whether a dyad ever had a colonial relationship, i.e. whether one was a colony of the other at some point in time; had a common colonizer after 1945, i.e. whether the two countries have been colonized by the same third country; has a current colonial link and whether the two countries have been part of the same polity.[52]

In addition to these measures, a dummy variable for whether two countries in a pair have same legal origins is also created. Same legal origin in a pair of countries might reduce information costs related to legal and regulatory systems. Moreover, sharing same legal origins might enhance trust between interacting parties (Guiso et al., 2009). Hence, we have a binary variable that takes value one if the two countries in a dyad have the same legal origins, zero otherwise [53]

We also take into account some policy related variables. As such, free trade area (FTA) and number of GATT/WTO members data are from Martin, Mayer and Thoenig (2008). As noted by Anderson and van Wincoop (2004), regional trade agreements may not be exogenous, and therefore, FTA included contemporaneously may suffer from reverse

[48] These data are compiled by the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII). The data are available at http://www.cepii.fr/anglaisgraph/bdd/distances.htm.

[49] Number of islands variable is created based on the data acquired from Global Island Database, available at http://gid.unep-wcmc.org/, and CIA The World Factbook, available at https://www.cia.gov/library/publications/the-world-factbook/index.html.

[50] Some authors have tried to account for terrain irregularities and mountainousness by using, for instance, the number of mountain chains or average elevation (Giuliano et al., 2006).

[51] See Nunn and Puga (2011) for more details on the index of terrain ruggedness and how it is calculated.

[52] These data come as well from CEPII. The data are available at http://www.cepii.fr/anglaisgraph/bdd/distances.htm.

[53] Legal origin indicators (common law, French civil law, German civil law, Scandinavian law, and Socialist law) are from La Porta et al. (1999).

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causality. A reasoning for this is that countries might have agreed on a trade agreement since they already have been trading lots for many reasons that are not observed by the econometrician. Consequently, we try lagging of FTA variable to overcome reverse causality. A four-period-lag of FTA is the best fit in terms of both significance and magnitude.

Summary statistics are provided in Table 1B in the Appendix.

Estimation Results

Baseline Results

We start off by reproducing the basic specification of the gravity equation, after which we augment the basic gravity equation with our indicator variable of "Different Civilization."

Standard "gravity" model of bilateral trade explains the natural logarithm of trade with the joint income of the countries and the logs of the distance between them together with border effects (see Anderson and van Wincoop, 2003 and Rose, 2004). We include GDP per capita product of the two countries as well in our basic specification. Anderson (1979) provides a rationale of non-unitary income elasticities and the inclusion of GDP per capita by modeling the amount spent on tradable goods as a fraction of total income.

Table 1 provides the estimation output. In column (1) of Table 1 we reproduce the basic gravity equation regression with time, importing and exporting country fixed effects to establish the validity of our data set before introducing our cultural variables. The coefficients are as expected. Products of GDP and GDP per capita positively affect bilateral trade while distance decreases, contiguity increases trade. Once we have shown that our data produce basic results that are in line with the literature we augment the gravity specification with different civilizations indicator. In column (2) we look at how different civilizational membership alone impacts trade. The effect is both economically and statistically significant. If two countries in a dyad belong to different civilizations their average bilateral imports are reduced by 118% compared to a dyad of the same civilization.[54] Of course, this specification suffers from omitted variable bias, and hence, the coefficient on different civilizations dummy is an over-estimate. In columns (3) and (4) we also have the variables of the basic gravity equation as determinants of trade flows

[54] Since $[exp(0.781) - 1] * 100 = 118$.

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with and without country of origin and country of destination fixed effects. As expected, the magnitude of the different civilizations variable drops, nevertheless, it maintains its economic significance and remains highly significant. Being part of different civilizations reduces average bilateral imports about 34 percent.

Table 1. Impact of Culture on Bilateral Trade: Baseline Results

	(1)	(2)	(3)	(4)
Different Civilizations		-0.781***	-0.298***	-0.274***
		(0.000)	(0.000)	(0.000)
ln Y_i*Y_j	0.286***		0.821***	0.259***
	(0.000)		(0.000)	(0.000)
ln y_i*y_j	0.815***		0.242***	0.841***
	(0.000)		(0.000)	(0.000)
ln Distance	-0.867***		-0.844***	-0.802***
	(0.000)		(0.000)	(0.000)
Contiguity	0.782***		0.729***	0.767***
	(0.000)		(0.000)	(0.000)
Year Fixed Effects	YES	YES	YES	YES
Importing Country Fixed Effects	YES	YES	NO	YES
Exporting Country Fixed Effects	YES	YES	NO	YES
Observations	206425	245423	206425	206425
R^2	0.771	0.698	0.663	0.772

Regressand: logarithm of Mean Bilateral Imports. Robust *p*-values (clustered at the dyad level) are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Main Results

Once we have established the validity of our data set and the intriguing results on different civilizations indicator, we further investigate this relationship as we reach our full specification controlling for further determinants of trade flows.

In column (1) of Table 2 we extend the basic specification by accounting for a full set of geographical barriers to trade. Namely, besides distance and contiguity we enrich our geographical account with the land mass of the countries, number of landlocked countries, number of islands and the terrain ruggedness of the countries. Inclusion of additional physical barriers has no effect on the different civilizations coefficient, it is

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Table 2. Impact of Culture on Bilateral Trade: Main Results I

	(1)	(2)	(3)	(4)	(5)
Different Civilizations	-0.274***	-0.196***	-0.194***	-0.180***	-0.205***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ln Y_i*Y_j	0.259***	0.340***	0.359***	0.449***	0.442***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ln y_i*y_j	0.841***	0.769***	0.749***	0.678***	0.684***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ln Distance	-0.802***	-0.690***	-0.685***	-0.666***	-0.673***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Contiguity	0.767***	0.638***	0.614***	0.569***	0.566***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ln $Area_i$*$Area_j$	0.191***	0.205***	0.184***	-0.084*	-0.088*
	(0.006)	(0.002)	(0.005)	(0.089)	(0.067)
Number of Landlocked Countries	-2.076***	-1.994***	-1.965***	-1.771***	-1.789***
	(0.000)	(0.000)	(0.000)	(0.007)	(0.006)
Number of Island Countries	-2.535***	-2.112***	-2.030***	-1.178	-1.203
	(0.000)	(0.000)	(0.000)	(0.148)	(0.135)
ln $Ruggedness_i$*$Ruggedness_j$	-0.697***	-0.630***	-0.618***	-0.349***	-0.354***
	(0.000)	(0.000)	(0.000)	(0.003)	(0.002)
Common Language		0.334***	0.159***	0.164***	
		(0.000)	(0.000)	(0.001)	
Ever Colonial Link		1.263***	1.133***	1.172***	1.243***
		(0.000)	(0.000)	(0.000)	(0.000)
Common Colonizer		0.803***	0.641***	0.627***	0.664***
		(0.000)	(0.000)	(0.000)	(0.000)
Current Colonial Link		-1.560**	-1.374**	-1.285*	-1.233*
		(0.050)	(0.048)	(0.052)	(0.061)
Ever Same Polity		0.981***	0.960***	0.962***	0.986***
		(0.000)	(0.000)	(0.000)	(0.000)
Same Legal Origin			0.438***	0.418***	0.453***
			(0.000)	(0.000)	(0.000)
FTA (t-4)				0.338***	0.332***
				(0.000)	(0.000)
Number of GATT/WTO Members				0.072***	0.072***
				(0.004)	(0.004)
Year Fixed Effects	YES	YES	YES	YES	YES
Importing Country Fixed Effects	YES	YES	YES	YES	YES
Exporting Country Fixed Effects	YES	YES	YES	YES	YES
N	206425	206425	206425	167195	167195
R^2	0.772	0.785	0.788	0.789	0.789

Regressand: logarithm of Mean Bilateral Imports. Robust *p*-values (clustered at the dyad level) are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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still highly negative and significant. As before GDP and GDP per capita positively affects trade, while distance reduces and contiguity increases trade. Land area is not a very well established variable in the literature (Rose and van Wincoop, 2001) and it does not produce consistently significant coefficients, which is an argument supported by Glick and Taylor (2005). Landlocked countries and island countries are consistently faced with more difficulties to trade. An innovation in our set of geographical barriers is ruggedness. As hypothesized by Nunn and Puga (2011) terrain ruggedness is a handicap that hampers trade. Not surprisingly, the coefficient on terrain ruggedness is always negative and highly significant.[55]

Column (2) of Table 2 displays the estimation results with the inclusion of some historical variables, such as common official language, ever colonial link, whether the two countries in a dyad were colonized by the same third country, current colonial link and whether the two countries were part of the same polity. These variables our commonly considered to be reflecting historical and institutional backgrounds (Blomberg and Hess, 2006; Glick and Taylor, 2005; Rose, 2004). Since they might be capturing an element of culture as well, the coefficient on different civilizations variable is now slightly reduced, though still large and statistically very significant. On average, two countries of different civilizations have 22 percent less imports than two countries of the same civilization. Common language increases bilateral trade. Past colonial links through bilateral colonial links, a common colonizer or being part of the same polity increase trade relations, whereas current colonial link has a negative effect on trade flows.

In column (3) we take into account same legal origin. As discussed by Guiso et al. (2009), sharing same legal origin might proxy for informational costs as well as norms of dealing with property rights. A quick look at Table 2 tells us that the countries that have the same legal origin significantly trade more. Their average bilateral imports are approximately 53 percent higher.

In columns (4) and (5) of Table 2 we take into account policy related variables such as free trade agreements (FTA) and GATT/WTO membership, with the difference that in column (5) we exclude common language variable to see how much this variable affects our different civilizations variables. As expected, FTAs and GATT/WTO memberships positively affect trade flows. Even in our full specification with an entire set of controls, our different civilizations indicator is statistically very significant and has a considerably

[55] In an unreported regression, we also controlled for additional geographical variables such as absolute differences in latitude and longitude and the internal distances of the countries. These additional variables do not have an effect on our results, and were mostly insignificant or dropped out of the regression due to high collinearity.

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Table 3. Impact of Culture on Bilateral Trade: Main Results II

	(1)	(2)	(3)	(4)	(5)	(6)
Same Majority Religion	0.077				0.032	0.039
	(0.116)				(0.532)	(0.445)
Same Majority Ethnicity		0.320***			0.192**	0.181**
		(0.000)			(0.032)	(0.043)
Same Majority Language			0.462***	0.540***	0.377***	0.459***
			(0.000)	(0.000)	(0.000)	(0.000)
ln Y_i*Y_j	0.360***	0.358***	0.350***	0.348***	0.348***	0.344***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ln y_i*y_j	0.764***	0.761***	0.779***	0.781***	0.790***	0.794***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ln Distance	-0.611***	-0.603***	-0.590***	-0.598***	-0.579***	-0.587***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Contiguity	0.590***	0.574***	0.562***	0.555***	0.548***	0.540***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ln $Area_i$*$Area_j$	-0.001	-0.020	-0.134***	-0.137***	0.098	0.094
	(0.987)	(0.715)	(0.007)	(0.006)	(0.128)	(0.146)
Number of Landlocked Countries	-1.345***	-1.035**	-2.848***	-2.857***	-2.894***	-2.910***
	(0.001)	(0.019)	(0.000)	(0.000)	(0.000)	(0.000)
Number of Island Countries	-1.554***	-3.096***	-0.805**	-0.854**	-2.158***	-2.200***
	(0.000)	(0.000)	(0.036)	(0.027)	(0.000)	(0.000)
ln $Ruggedness_i$*$Ruggedness_j$	-1.322***	-1.288***	-0.985***	-1.004***	-0.287**	-0.307**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.031)	(0.021)
Common Language	0.208***	0.191***	0.130**		0.132**	
	(0.000)	(0.000)	(0.017)		(0.018)	
Ever Colonial Link	1.119***	1.155***	1.117***	1.167***	1.129***	1.179***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Common Colonizer	0.488***	0.477***	0.396***	0.426***	0.399***	0.430***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Current Colonial Link	-1.203*	-1.215*	-1.125*	-1.070*	-1.134*	-1.078*
	(0.061)	(0.060)	(0.075)	(0.087)	(0.072)	(0.084)
Ever Same Polity	1.018***	1.082***	1.093***	1.111***	1.157***	1.176***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Same Legal Origin	0.393***	0.400***	0.342***	0.367***	0.346***	0.371***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
FTA (t-4)	0.283***	0.282***	0.259***	0.255***	0.265***	0.261***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Number of GATT/WTO Members	0.106***	0.102***	0.107***	0.107***	0.104***	0.105***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Importing Country Fixed Effects	YES	YES	YES	YES	YES	YES
Exporting Country Fixed Effects	YES	YES	YES	YES	YES	YES
N	128672	126564	125100	125100	121746	121746
R^2	0.784	0.785	0.787	0.787	0.788	0.787

Regressand: logarithm of Mean Bilateral Imports. Robust *p*-values (clustered at the dyad level) are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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large economic effect. Two countries of different civilizations trade 19 to 22 percent less than two countries of the same civilization.

To reiterate our findings further we now investigate the effect of other measures of cultural cleavages/similarity. Using *Ellingsen's Measure* of majority religions, ethnicities and languages within countries we probe the relationship between trade flows and sharing dominant religious, ethnic and linguistic heritages. To this end, we bring in new indicator variables for when the two countries in a dyad have the same majority religion or/and the same majority ethnicity or/and the same majority language.

First column of Table 3 shows that sharing the same dominant religion positively affects trade relations, though it is statistically insignificant. Columns (2) and (3) do the same exercise when the two countries share the same majority ethnicity and same majority language, respectively. When the two countries in a dyad have the same dominant ethnicity they have about 38 percent higher average imports than the two countries that do not have the same dominant ethnicity. On the other hand, two countries with the same majority language have 58 percent higher mean imports when we control for official common language and 71 percent higher mean imports when we do not control for official common language. Columns (5) and (6) look at the effects of all three variables when included together. The results carry over. Same majority religion is still positive but insignificant, while same majority ethnicity and same majority language are both strongly positive and highly significant. As before, sharing the same dominant language shows the largest magnitude.

To further investigate the impact of sharing same religious, ethnic and linguistic backgrounds we create four new indicator variables; namely, *"Majority Religion-Ethnicity-Language"* when the two countries in a dyad have the same majority religion, the same majority ethnicity as well as the same majority language; *"Majority Religion-Ethnicity"* when the two countries in a dyad have the same majority religion and also the same majority ethnicity; *"Majority Religion-Language"* when the two countries in a dyad have the same majority religion and also the same majority language; *"Majority Ethnicity-Language"* when the two countries in a dyad have the same majority ethnicity and also the same majority language.

The results of the estimations with these new explanatory variables are reported in Table 4. The results are not surprising and in support of our previous findings. As expected, sharing same dominant religion, ethnicity and language has a strong positive influence on trade. It increases mean imports by 27 percent in comparison to a pair of countries sharing none of these heritages. Sharing the same majority religion and ethnicity or the

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Table 4. Impact of Culture on Bilateral Trade: Main Results III

	(1)	(2)	(3)	(4)
Majority Religion-Ethnicity-Language	0.241**			
	(0.049)			
Majority Religion-Ethnicity		0.168*		
		(0.057)		
Majority Religion-Language			0.193**	
			(0.018)	
Majority Ethnicity-Language				0.278**
				(0.023)
ln Y_i*Y_j	0.478***	0.477***	0.479***	0.481***
	(0.000)	(0.000)	(0.000)	(0.000)
ln y_i*y_j	0.649***	0.650***	0.648***	0.645***
	(0.000)	(0.000)	(0.000)	(0.000)
ln Distance	-0.700***	-0.698***	-0.701***	-0.699***
	(0.000)	(0.000)	(0.000)	(0.000)
Contiguity	0.573***	0.575***	0.569***	0.572***
	(0.000)	(0.000)	(0.000)	(0.000)
ln $Area_i$*$Area_j$	-0.095*	-0.094*	-0.096*	-0.095*
	(0.060)	(0.062)	(0.059)	(0.061)
Number of Landlocked Countries	-1.665**	-1.671**	-1.660**	-1.658**
	(0.011)	(0.010)	(0.011)	(0.011)
Number of Island Countries	-1.056	-1.064	-1.048	-1.039
	(0.194)	(0.190)	(0.197)	(0.201)
ln $Ruggedness_i$*$Ruggedness_j$	-0.353***	-0.353***	-0.354***	-0.354***
	(0.002)	(0.002)	(0.002)	(0.002)
Common Language	0.184***	0.190***	0.162***	0.181***
	(0.000)	(0.000)	(0.001)	(0.000)
Ever Colonial Link	1.161***	1.160***	1.156***	1.162***
	(0.000)	(0.000)	(0.000)	(0.000)
Common Colonizer	0.626***	0.624***	0.633***	0.624***
	(0.000)	(0.000)	(0.000)	(0.000)
Current Colonial Link	-1.273*	-1.278*	-1.249*	-1.270*
	(0.060)	(0.058)	(0.063)	(0.060)
Ever Same Polity	0.947***	0.952***	0.946***	0.947***
	(0.000)	(0.000)	(0.000)	(0.000)
Same Legal Origin	0.419***	0.421***	0.416***	0.419***
	(0.000)	(0.000)	(0.000)	(0.000)
FTA (t-4)	0.370***	0.372***	0.369***	0.371***
	(0.000)	(0.000)	(0.000)	(0.000)
Number of GATT/WTO Members	0.075***	0.074***	0.078***	0.075***
	(0.002)	(0.003)	(0.002)	(0.002)
Year Fixed Effects	YES	YES	YES	YES
Importing Country Fixed Effects	YES	YES	YES	YES
Exporting Country Fixed Effects	YES	YES	YES	YES
N	167195	167195	167195	167195
R^2	0.789	0.789	0.789	0.789

Regressand: logarithm of Mean Bilateral Imports. Robust *p*-values (clustered at the dyad level) are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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same majority religion and language has a smaller effect, although it is still sizeable (between 18 to 20 percent higher) and statistically significant. We see the biggest effect when the two countries share the same ethnicity and the same language. The average imports are 32 percent higher compared to a country pair sharing none of the these two cultural variables.

Is Huntington Right?

When Samuel Huntington put his "The Clash of Civilizations?" hypothesis forward and hypothesized that "the great divisions among humankind and the dominating source of conflict in the post-Cold War era will be cultural" (Huntington, 1993), he did not only have military clashes in mind but also economic and political clashes. At the micro level, the violent struggles among peoples will result as a consequence of the fault lines between civilizations, however, at the macro level, states from different civilizations will compete for economic and political power (Huntington, 1993). Huntington's "The Clash of Civilizations?" hypothesis drew a lot of attention to military conflicts between countries and some authors have tried testing it from different angles (Chiozza, 2002; Gokmen, 2011; Henderson, 1997, 1998; Henderson and Tucker, 2001; Russett et al., 2000). Nevertheless, to our knowledge, the economic clash aspect has never been put to rigorous econometric testing. Therefore, we take the challenge and test whether there has been an amplification in economic clash in the post-Cold War era as Huntington suggested.

Huntington takes civilizations as the main unit of his analyses. A civilization is defined as "a cultural entity, the highest cultural grouping of people and the broadest level of cultural identity people have short of what distinguishes humans from other species. It is defined both by common objective elements, such as language, history, religion, customs, institutions, and by the subjective self-identification of people."[56] Huntington takes the central defining characteristic of a civilization as its religion; hence, the major civilizations in human history have been closely identified with the world's great religions. These civilizations outlined include the Sinic, Japanese, Hindu, Islamic, Orthodox, Western, Latin American, Buddhist and possibly African civilizations plus "lone" countries that do not belong to any of the major civilizations.

According to Huntington, inter-civilizational differences stand out in the way individuals comprehend the relations between God and man, the individual and the group, the

[56] Huntington (1993a), p.23-24.

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citizen and the state, parents and children, husband and wife as well as in the weight of importance they put in matters of responsibility and rights, freedom and authority, and equality and hierarchy. He further claims that these differences are largely irresolvable; they are the product of centuries and are far more fundamental than differences among political ideologies and political regimes as they concern the very self-identification of man. The fact that people identify themselves with a civilization inevitably implies that they think of themselves separately from other civilizations and differentiate themselves from the members of other civilizations. To highlight this point, Huntington argues that identity at any level -personal, tribal, racial, civilizational - can only be defined in relation to an "other", a different person, tribe, race, or civilization. This brings about a group identity in the simple form of "us" and "them" which nurtures clashes with those that are different.

Huntington (1993, 1998), viewing culture as the “cause,” suggests that civilizations tend to clash with other civilizations that do not share their culture, world view and values. Such vehement tendencies, he argues, long held in check by the Cold War, have been unleashed by the end of the Cold War and, from then onwards, form the dominant pattern of global conflict. One theorem that logically devolves from Huntington’s cultural realist rendering of clashing civilizations is that the degree of cultural dissimilarity between states should predict the likelihood of clashes between them. In this view, culturally dissimilar dyads, ceteris paribus, should be more inclined to conflict than culturally similar dyads. As such, Huntington claims that in the post-Cold War world the most important distinctions among peoples are not ideological, political, or economic, but they are cultural, and therefore, he prophesies that in the post-Cold War[57] era, compared to the Cold War era, we are to witness a surge in the clash of civilizations. By the end of the Cold War, the demise of ideology will accentuate the differences between civilizations and the clashes between civilizations will be unleashed. This is what we empirically test from an economic clash standpoint in what follows.

Before carrying out regressions, to see whether there is seemingly an economic clash of different civilization country pairs we plot mean trades calculated for different and same civilizations and their difference at each year. As such, Figure I delivers a first-pass understanding of how trade relations of countries from different and same civilizations evolved over time. We observe that from 1950s up until current day mean trade between countries of the same civilization has always been more than that of countries of different civilizations (left scale). This is not very informative as the two seem to evolve in a very similar pattern. However, if we look at the evolution of the difference between the mean

[57] By most, Cold War is considered to have lasted between 1945-1991.

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trade of the same civilization countries and different civilization countries, we notice a rather different story (right scale). This difference seems to be rather stable from 1950 up until some point around 1985. From that point on, we see that this difference always has an upward trend and the increase in mean same civilization trade is more than the increase in mean different civilizations trade. This analysis from Figure I indicates two rather different stories, one for the Cold War period and another one for the post-Cold War period.

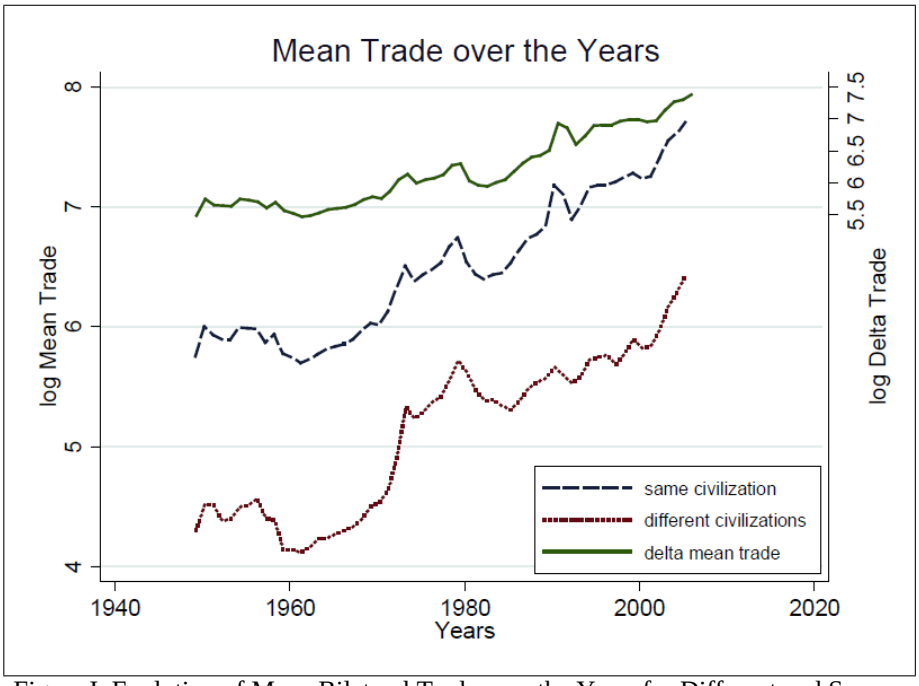

Figure I. Evolution of Mean Bilateral Trade over the Years for Different and Same Civilization Country Dyads

If we turn to Table 5, we observe a set of estimations for both Cold War and post-Cold War periods in columns (1) and (2), respectively. Each cell of a row reports the coefficient on our cultural variable of interest from a regression of mean bilateral imports with all other determinants of trade flows in the two respective time periods.

A cursory look at Table 5 would convince one that there is a surge in economic clash in the post-Cold War era as Huntington hypothesized. The effect of belonging to two different civilizations on bilateral trade is much bigger in the post-Cold War era. Although different civilizations membership negatively impacts trade in the Cold War, it is insignificant with a very small magnitude (about 7 percent). On the other hand, in the

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Table 5. Impact of Culture on Trade: Cold War vs. post-Cold War Comparisons

	(1) Cold War	(2) post-Cold War
Different Civilizations	-0.078	-0.345***
	(0.136)	(0.000)
Same Majority Religion	0.094*	0.140**
	(0.076)	(0.031)
Same Majority Ethnicity	0.234**	0.465***
	(0.017)	(0.000)
Same Majority Language	0.302***	0.818***
	(0.004)	(0.000)
Majority Religion-Ethnicity-Language	0.172	0.568***
	(0.204)	(0.000)
Majority Religion-Ethnicity	0.145	0.374***
	(0.141)	(0.000)
Majority Religion-Language	0.216**	0.491***
	(0.038)	(0.000)
Majority Ethnicity-Language	0.271**	0.537***
	(0.045)	(0.000)

Regressand: log Mean Bilateral Imports. Regressors included but with unrecorded coefficients: ln Y_i*Y_j, ln y_i*y_j, ln Distance, Contiguity, ln $Area_i$*$Area_j$, Number of Landlocked Countries, Number of Island Countries, ln $Ruggedness_i$*$Ruggedness_j$, Common Language, Ever Colonial Link, Common Colonizer, Current Colonial Link, Ever Same Polity, Same Legal Origin, FTA (t-4), Number of GATT/WTO Members and a constant as well as time and importing and exporting country fixed effects. Heteroskedasticity and serial correlation robust *p*-values (clustered at the dyad level) are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

post-Cold War era, two countries that belong to different civilizations have about 41 percent less mean imports than two countries that share the same civilization. This finding is very robust and is not subject to the definition of civilizations. In the following rows of the Table 5 we repeat the same exercise with our various measures of culture/civilization. Both economic significance and statistical significance is much stronger in the post-Cold War era than in the Cold War era. For instance, when the two trading partners share the same dominant religion, ethnicity and language, their trade is not significantly affected

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during the Cold War; whereas in the post-Cold War epoch they trade 76 percent more than a pair of countries that do not share these values. A country pair with the same majority religion has 6 percent higher mean imports in the post-Cold War compared to the Cold War.

These findings are very strong. In the post-Cold War period countries of different civilizational/cultural heritage have shown to display a much stronger economic clash than in the Cold War era. May the cultural heritage be being part of a civilization as Huntington classified or a more concrete definition of dominant religious, ethnic and linguistic populations, the results do not change. We observe that these results show us the end of the Cold War brought about more conflictual economic relations among countries of heterogeneous cultural backgrounds.

Sensitivity Analysis

In this section we challenge the sensitivity of our results. We do that, first, by including a popular measure of cultural distance -namely, genetic distance variable- and testing whether our measures of culture survive the inclusion of genetic distance. Second, we look into how the exclusion of zero trade flows might affect our results. Third, we break the panel data into five year intervals and run cross-sectional analysis.

Our Measures of Culture vs. Genetic Distance

Genetic distance variable as a proxy for culture has recently attracted a myriad of researchers (Giuliano, Spilimbergo and Tonon, 2006; Guiso, Sapienza and Zingales, 2009; Spolaore and Wacziarg, 2009a, 2009b). To that end, we would like to test the sensitivity of our measures of culture against genetic distance variable and see how they fare in comparison.

Genetic distance is a summary measure of differences in allele frequencies across a range of neutral genes (or chromosomal loci). Correspondingly, the index constructed measures the genetic variance between populations as a fraction of the total genetic variance. Given genetic characteristics are transmitted throughout generations at a regular pace, genetic distance is closely linked to the times when two populations shared common ancestors. It is argued that the degree of genetic distance also reflects cultural distance for culture can be transmitted across genetically related individuals, and therefore, populations that are farther apart genealogically tend to be, on average, more different in

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characteristics that are transmitted with variations from parents to children.[58]

In this strand of the literature, for instance, using genetic distance as a measure of cultural similarity/dissimilarity, researchers tried to explain the differences in the level of development across countries (Spolaore and Wacziarg, 2009a), the effect of culture on the likelihood of conflict involvement of country dyads (Spolaore and Wacziarg, 2009b) or the level of trust populations have for each other (Guiso, Sapienza and Zingales, 2009).

Given the above discussion and the importance of genetic distance in recent times we deem it necessary to establish the robustness of our results to the inclusion of this variable. The genetic distance data we use are from Spolaore and Wacziarg (2009a) as the genetic distance information on populations is mapped onto countries.

Table 6. Do Our Measures of Culture Survive Genetic Distance?

	(1)	(2)	(3)	(4)	(5)	(6)
Different Civilizations			-0.136***			
			(0.002)			
Same Majority Religion				0.105**		
				(0.031)		
Same Majority Ethnicity					0.241***	
					(0.010)	
Same Majority Language						0.408***
						(0.000)
Genetic Distance	-0.00024***	-0.00020***	-0.00019***	-0.00018***	-0.00017***	-0.00018***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	242608	165413	165413	128098	126001	124540
R^2	0.726	0.792	0.792	0.785	0.787	0.788

Regressand: log Mean Bilateral Imports. Regressors included but with unrecorded coefficients: column (1) includes only geographical barriers that are ln Distance, Contiguity, ln $Area_i$*$Area_j$, Number of Landlocked Countries, Number of Island Countries, ln $Ruggedness_i$*$Ruggedness_j$ and a constant as well as time and country fixed effects; the remaining columns include the full set of control variables that are ln Y_i*Y_j, ln y_i*y_j, ln Distance, Contiguity, ln $Area_i$*$Area_j$, Number of Landlocked Countries, Number of Island Countries, ln $Ruggedness_i$*$Ruggedness_j$, Common Language, Ever Colonial Link, Common Colonizer, Current Colonial Link, Ever Same Polity, Same Legal Origin, FTA (t-4), Number of GATT/WTO Members and a constant as well as time and country fixed effects. Heteroskedasticity and serial correlation robust *p*-values (clustered at the dyad level) are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

We present the results in Table 6. Before contrasting our measures of culture with genetic distance we, first, would like to consider whether genetic distance has any explanatory power in trade relations when we take into account basic determinants of trade

[58] For more details and the discussion on the construction of genetic distance between populations, its corresponding mapping onto countries and its cultural implications, interested reader should see Cavalli-Sforza and Feldman (1981), Cavalli-Sforza et al. (1994), Giuliano, Spilimbergo and Tonon (2006) and Spolaore and Wacziarg (2009a).

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barriers. Giuliano, Spilimbergo and Tonon (2006) suggest that the effect captured by genetic distance is geographic barriers, not cultural ones. The authors show that the same geographic determinants that explain transportation costs also explain genetic distance. In addition, they provide evidence that genetic distance in a gravity equation of bilateral trade has no significance once one controls for transportation costs. Having said that, in the first column of Table 6, without including our measures of culture, we regress bilateral imports on genetic distance and geographic trade barriers only and in the second column on genetic distance and the entire set of control variables. In both cases, although genetic distance appears as statistically significant, it has near to zero economic significance. This is not to say genetic distance does not matter, however, caution is needed when using it as a cultural proxy.

Subsequently, we carry on with our tests of whether our measures of culture survive genetic distance. In column (3) of Table 6 we observe that our binary indicator of different civilizations not only maintains its negative sign and high statistical significance, but it also has a sizeable economic magnitude. When two countries in a dyad belong to different civilizations, their average trade is about 15 percent less than two countries of the same civilization.

In columns (4), (5) and (6) we carry out similar exercises for the robustness of same religious, same ethnic and same linguistic heritage variables to the inclusion of genetic distance variable. In all three cases our measures of culture do not suffer from the inclusion of genetic distance and they are significant. That is to say that even after controlling for genetic distance, countries that have the same dominant religion or the same dominant ethnicity or the same dominant language trade more with one another than country pairs that do not share the same values. For instance, if the two countries in a dyad have the same majority ethnic group, then their mean trade is around 27 percent higher on average compared to a country pair that do not share the same majority ethnic group.

All in all, we can confidently conclude from the above analysis that our measures of culture are not sensitive to the inclusion of genetic distance as a proxy for culture. Therefore, if we believe that genetic distance captures an element of culture, our measures of culture explain some constituent of culture on top of genetic distance variable, which is not explained by genetic distance.

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Zero Trade Flows in the Gravity Model

Zero-valued trade flows between pairs of countries in gravity models might be a source of concern as argued by some authors.[59] Linders and de Groot (2006) showed that the simplest solution to this potential problem is to omit zero flows from the sample and this approach often leads to acceptable results. However, we would still like to look into whether exclusion of zero trade flows substantially change our results. We do this with the simple approach used in the literature and add one to the trade flows before taking the logarithm. Hence, our dependent variable becomes the logarithm of one plus mean imports between two countries. This procedure allows us to not drop zero trade flows and see whether our results react to the inclusion of zero trade flows.

Table 7. Zero Trade Flows in the Gravity Model

	(1)	(2)	(3)
	Cold War	post-Cold War	Full Sample
Different Civilizations	-0.103***	-0.359***	-0.213***
	(0.007)	(0.000)	(0.000)
Same Majority Religion	0.037	0.054	0.022
	(0.340)	(0.252)	(0.533)
Same Majority Ethnicity	0.259***	0.440***	0.325***
	(0.000)	(0.000)	(0.000)
Same Majority Language	0.210***	0.648***	0.340***
	(0.006)	(0.000)	(0.000)

Regressand: log (1+Mean Bilateral Imports). Regressors included but with unrecorded coefficients: ln Y_i*Y_j, ln y_i*y_j, ln Distance, Contiguity, ln $Area_i$*$Area_j$, Number of Landlocked Countries, Number of Island Countries, ln $Ruggedness_i$*$Ruggedness_j$, Common Language, Ever Colonial Link, Common Colonizer, Current Colonial Link, Ever Same Polity, Same Legal Origin, FTA (t-4), Number of GATT/WTO Members and a constant as well as importing and exporting country fixed effects. Heteroskedasticity and serial correlation robust *p*-values (clustered at the dyad level) are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The results using the new dependent variable defined above is in Table 7. Each column corresponds to regressions run over three different periods, Cold War, post-Cold War and the entire sample. Each row displays the coefficient corresponding to one of our measures of culture when included in a regression together with the full set of control

[59] For a discussion on the source of concern and the method of treatment of zero-trade flows in the gravity models, see Linders and de Groot (2006) and Silva and Tenreyro (2006).

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variables.

Our previous results carry over. Being part of different civilizations has a stronger trade impeding effect in the post-Cold War era than in the Cold War era. Alternatively, sharing the same religion or the same ethnicity or the same language has a much bigger trade promoting ramification over the post-Cold War period with respect to the Cold War period. For example, different civilizational memberships reduce the average trade between two countries by 43 percent in the post-Cold War periods while the reduction is a much lower 10 percent in the Cold War period. To give another example, while sharing the same ethnicity increases mean trade by 55 percent in the post-Cold War period, it raises it by only 29 percent in the Cold War. From this discussion and the results provided in Table 7, we can be reassured that our findings are not due to the omission of zero-trade flows and the conclusions still hold even if we include zero flows.

Cross-Sectional Analysis

To evaluate how the role played by cultural measures in explaining bilateral trade evolved throughout time we turn, in this section, to cross-sectional analysis at five-year intervals. From 1955 on, for each five year period we estimate bilateral imports on the entire set of determinants of trade and our measures of culture.

If we look at column (1) of Table 8, we notice that binary indicator of different civilizations maintains an overall negative sign; however, it gains statistical significance only after 1985 on. Notice also the jump in magnitude from 1980 to 1985.

Let us turn to column (2). Notice how the sign of the coefficient on same majority religion indicator becomes positive from 1985 on and not only undergoes a huge jump in magnitude but also gains statistical significance in the year 1990. In column (3) and (4) we see that same majority ethnicity and same majority language indicators maintain an overall positive sign and significance. One thing is important to take note of. In column (4), although both are positive and statistically significant, the magnitude of the same majority language coefficient more than doubles from 1985 to 1990.

All this evidence is in support of our findings. We see that there is a heightened degree of economic clash at some point after 1985. However, these findings lead one to be skeptical about the general consensus about the duration of the Cold War period. Even though the Cold War is considered to have ended by 1991, the evidence suggests that the *de facto* end of the Cold War has happened earlier and some time between 1985 and

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Table 8. Cross-Sectional Analysis

	(1)	(2)	(3)	(4)
		Same	Same	Same
	Different	Majority	Majority	Majority
	Civilizations	Religion	Ethnicity	Language
1955	0.238	-0.109	-0.475	-0.062
	(0.172)	(0.769)	(0.125)	(0.827)
1960	0.201	0.250	-0.022	-0.266
	(0.115)	(0.431)	(0.913)	(0.217)
1965	-0.010	-0.104	0.035	-0.105
	(0.914)	(0.660)	(0.860)	(0.536)
1970	-0.142	0.002	0.458***	0.460***
	(0.118)	(0.983)	(0.005)	(0.002)
1975	-0.018	-0.111	0.046	0.184
	(0.824)	(0.319)	(0.758)	(0.234)
1980	-0.075	-0.043	0.333**	0.352**
	(0.364)	(0.699)	(0.037)	(0.030)
1985	-0.240***	0.095	0.355**	0.394***
	(0.002)	(0.367)	(0.021)	(0.008)
1990	-0.335***	0.243**	0.441***	0.810***
	(0.000)	(0.013)	(0.002)	(0.000)
1995	-0.232***	0.098	0.626***	0.837***
	(0.000)	(0.260)	(0.000)	(0.000)
2000	-0.413***	0.188**	0.424***	0.751***
	(0.000)	(0.012)	(0.000)	(0.000)
2005	-0.383***			
	(0.000)			

Regressand: log Mean Bilateral Imports. Regressors included but with unrecorded coefficients: ln Y_i*Y_j, ln y_i*y_j, ln Distance, Contiguity, ln $Area_i$*$Area_j$, Number of Landlocked Countries, Number of Island Countries, ln $Ruggedness_i$*$Ruggedness_j$, Common Language, Ever Colonial Link, Common Colonizer, Current Colonial Link, Ever Same Polity, Same Legal Origin, FTA (t-4), Number of GATT/WTO Members and a constant as well as importing and exporting country fixed effects. Heteroskedasticity and serial correlation robust *p*-values (clustered at the dyad level) are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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1990, which was also a conclusion of our analysis of Figure I.

Conclusion

This paper contributes to the literature on the relation between culture and bilateral trade flows of countries. First contribution of the paper is to establish the link between cultural dissimilarity/similarity and mean bilateral imports of countries. However, the main

novelty of this study is to test Huntington's the *Clash of Civilizations* hypothesis from an economic perspective.

To be more specific, this paper first shows whether cultural dissimilarity between countries is, by and large, a barrier to trade. We do that by estimating a theory based gravity model of international trade and by using a comprehensive set of cultural variables that allow us to look at different aspects of culture. Based on Huntington's classification and categorization of civilizational membership of countries, we provide evidence that when two countries in a dyad are members of different civilizations their mean imports are up to 34 percent lower than that of two countries of the same civilization. We also show that when two countries in a dyad share the same ethnicity or the same language their trade relations are strongly improved upon. While two countries with the same dominant ethnicity have 38 percent higher mean imports, two countries with the same dominant language enjoy 58 percent higher mean imports.

Furthermore, we examine Huntington's "The Clash of Civilizations?" hypothesis from an economic clash point of view. We provide evidence suggesting that there is a very strong surge in economic clash (in terms of trade relations) across countries in the post-Cold War era compared to the Cold War era. For instance, two countries that belong to different civilizations have 41percent reduced mean imports in the post-Cold War period compared to two countries of the same civilization, whereas this effect is insignificant during the Cold War. Alternatively, if a pair of countries share the same majority religion, the same majority ethnicity and the same majority language, in the post-Cold War epoch their average bilateral imports are 76 percent higher than a pair of countries that do not share the same heritages, whereas this effect is not significant in the Cold War era.

Establishing the impact of culture on trade and how this relationship evolves throughout time might only be the tip of an iceberg. One natural question to ask upon observing our results is the reason why we see such a sharp pattern of increased economic clash

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in the post-Cold War era. Huntington claimed that we observe such clashes because the demise of ideology in the aftermath of the Cold War unleashed cultural fault lines that were previously held in check by ideological doctrines. Therefore, a natural future line of research would be to look into whether this claim is true and to identify the underlying reasons as for why there is a *Clash of Civilizations*.

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Appendix

Table 1A. Civilization Membership

Civilization	Country
Western	Andorra, Australia, Austria, Barbados, Belgium, Canada, Croatia, Czech Rep., Denmark, Dominica, Estonia, Finland, France, French Guiana, Germany, Greenland, Grenada, Hungary, Iceland, Ireland, Israel, Italy, Jamaica, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Netherlands, New Zealand, Norway, Papua New Guinea, Philippines, Poland, Portugal, San Marino, Slovakia, Slovenia, Solomon Islands, Spain, Sweden, Switzerland, Trinidad and Tobago, United Kingdom, United States, Vanuatu.
Sinic	China, Hong Kong, North Korea, South Korea, Taiwan, Vietnam.
Islamic	Afghanistan, Albania, Algeria, Azerbaijan, Bahrain, Bangladesh, Bosnia and Herzegovina, Brunei, Burkina Faso, Chad, Djibouti, Egypt, Eritrea, Gambia, Guinea, Guinea-Bissau, Indonesia, Iran, Iraq, Jordan, Kyrgyzstan, Kuwait, Lebanon, Libya, Malaysia, Mali, Mauritania, Morocco, Niger, Oman, Pakistan, Qatar, Saudi Arabia, Senegal, Somalia, Sudan, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, United Arab Emirates, Uzbekistan, Yemen.
Hindu	Guyana, India, Nepal.
Orthodox	Armenia, Belarus, Bulgaria, Cyprus, Georgia, Greece, Kazakhstan, Macedonia, Moldova, Romania, Russia, Serbia, Ukraine.
Latin American	Antigua and Barbuda, Argentina, Bahamas, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Rep., Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Saint Lucia, St.Vincent & Grenadines, Uruguay, Venezuela.
African	Angola, Benin, Botswana, Burundi, Cameroon, Cape Verde, Central African Republic, Comoros, Congo, Congo Dem. Rep. (Zaire), Equatorial Guinea, Gabon, Ghana, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Nigeria, Rwanda, Sao Tome and Principe, Sierra Leone, South Africa, Suriname, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe.
Buddhist	Bhutan, Cambodia, Lao People's Dem. Rep., Mongolia, Myanmar, Singapore, Sri Lanka, Thailand.
"**Lone" States**	Ethiopia, Haiti, Japan.

Source: Author's own construction based on Huntington (1998).

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Table 1B: Summary Statistics

	Mean	Std.	N
Imports (Geometric Mean)	129.15	1860.28	476250
Different Civilizations	0.82	0.38	561356
Same Majority Religion	0.37	0.48	488473
Same Majority Ethnicity	0.032	0.17	487316
Same Majority Language	.042	.20	474560
Genetic Distance	1081.47	811.5	675391
GDP (product)	2.85e+10	4.63e+11	520445
GDP per capita (product)	43125685.12	1.35e+08	520445
Distance	7802.04	4411.10	559927
Contiguity	0.04	0.19	561356
Land Area (product)	7.84e+11	5.23e+12	555923
Number of Landlocked Countries	0.38	0.55	555923
Number of Island Countries	0.43	0.58	636729
Ruggedness (product)	1.80	2.81	621403
Common Language	0.16	0.36	559927
Ever Colonial Link	0.01	0.12	575302
Common Colonizer	0.10	0.29	575302
Current Colonial Link	0.00	0.02	559927
Ever Same Polity	0.01	0.10	559927
Same Legal Origin	0.34	0.47	604740
Free Trade Agreements (t-4)	0.03	0.16	257775
Number of GATT/WTO Members	1.41	0.64	284337
One Communist Regime Among Partners	0.14	0.35	298896

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References

[1] Algan, Y. and Cahuc, P. 2007. "Social Attitudes and Macroeconomic Performance: An Epidemiological Approach." Mimeo, Paris School of Economics.

[2] Anderson, J. E. 1979. "A Theoretical Foundation for the Gravity Equation." The American Economic Review, 69(1), 106-116.

[3] Anderson, J. E. and Marcouiller, D. 2002. "Insecurity and the Pattern of Trade: An Empirical Investigation." The Review of Economics and Statistics, 84 (2), 342–352.

[4] Anderson, J. E. and van Wincoop, E. 2003. “Gravity with Gravitas: A Solution to the Border Puzzle.” The American Economic Review, 93 (1), 170–192.

[5] Anderson, J. E. and van Wincoop, E. 2004. "Trade Costs." Journal of Economic Literature, Vol. XLII, 691-751.

[6] Anderson, J. E. 2011. "The Gravity Model." Annual Review of Economics, Vol. 3, 133-160.

[7] Baldwin, R. and Taglioni, D. 2007. "Trade Effects of the Euro: A Comparison of Estimators." Journal of Economic Integration, 22 (4), 780-818.

[8] Baltagi, B. H. and Khanti-Akom, S. 1990. "On Efficient Estimation with Panel Data: An Empirical Comparison of Instrumental Variables." Journal of Applied Econometrics, 5, 401-406.

[9] Banfield, E. C. 1958. "The Moral Basis of a Backward Society." New York: Free Press.

[10] Barbieri, K. 2002. "The Liberal Illusion: Does Trade Promote Peace?" Ann Arbor: University of Michigan Press.

[11] Barbieri, K., Keshk, O. and Pollins, B. 2005. "Correlates of War Project Trade Data Set Codebook, Version 1.0."

[12] Barbieri, K., Keshk, O. and Pollins, B. 2008. "Correlates of War Project Trade Data Set Codebook, Version 2.01."

[13] Barbieri, K., Keshk, O. and Pollins, B. 2009. “TRADING DATA: Evaluating our Assumptions and Coding Rules.” Conflict Management and Peace Science, Forthcoming.

[14] Barro, R. J. and McCleary, R. M. 2003. “Religion and Economic Growth.” American Sociological Review, 68, 760–781.

[15] Bergstrand, J. H. 1985. "The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence." Review of Economics and Statistics, 67(3), 474-481.

[16] Bergstrand, J. H. 1989. "The Generalized Gravity Equation, Monopolistic Competition, and the Factor- Proportions Theory in International Trade." Review of Economics and Statistics, 71(1), 143-153.

[17] Bergstrand, J. H. 1990. "The Heckscher-Ohlin-Samuelson Model, the Linder Hypothesis and the Determinants of Bilateral Intra-Industry Trade." Economic Journal, 100(403), 1216-1229.

[18] Berkowitz, D., Moenius, J. and Pistor, K. 2006. "Trade, Law, and Product Complexity." The Review of Economics and Statistics, 88(2), 363-373.

[19] Blomberg, S. B. and Hess, G. D. 2006. "How Much Does Violence Tax Trade?" The

Tesi di dottorato ""Essays in Political and Institutional Economics""
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Review of Economics and Statistics, 88(4), 599-612.

[20] Botticini, M. and Eckstein, Z. 2005. "Jewish Occupational Selection: Education, Restrictions, or Minorities?" Journal of Economic History, 65, 922–48.

[21] Cavalli-Sforza, L. L. and Feldman, M. W. 1981. "Cultural Transmission and Evolution." Princeton: Princeton University Press.

[22] Cavalli-Sforza, L. L., Menozzi, P. and Piazza, A. 1994. "The History and Geography of Human Genes." Princeton, New Jersey: Princeton University Press.

[23] Chiozza, G. 2002. "Is There a Clash of Civilizations? Evidence from Patterns of International Conflict Involvement, 1946–97." Journal of Peace Research 39: 711–34.

[24] Correlates of War Project. 2007. "Direct Contiguity Data, 1816-2006. Version 3.1."

[25] Correlates of War Project. 2008. "Trade Data Set, 1870-2006. Version 2.01."

[26] de Groot, H. L. F., Linders, G., Rietveld, P. and Subramanian, U. 2004. "The Institutional Determinants of Bilateral Trade Patterns." Kyklos, 57, 103–123.

[27] Ellingsen, T. 2000. "Colorful Community or Ethnic Witches' Brew? Multiethnicity and Domestic Conflict during and after the Cold War." Journal of Conflict Resolution, 44(2), 228-249.

[28] Feenstra, R. C. 2002. "Border Effects and the Gravity Equation: Consistent Methods for Estimation." Scottish Journal of Political Economy, Vol. 49, No.5, 491-506.

[29] Felbermayr, G. J. and Toubal, F. 2010. "Cultural Proximity and Trade." European Economic Review, Vol. 54, 279-293.

[30] Fernandez, R. 2007. "Culture and Economics." In:Durlauf, S., N., Blume,L., E., (Eds.), New Palgrave Dictionary of Economics, second ed. Palgrave McMillan, New York.

[31] Fernandez, R and Fogli, A. 2007."Culture: An Empirical Investigation of Beliefs, Work, and Fertility." NBER Working Paper #W11268.

[32] Gartzke, E. and Gleditsch, K. S. 2006. "Identity and Conflict: Ties that Bind and Differences that Divide." European Journal of International Relations, 12(1): 53-87.

[33] Giuliano, P. 2007. "Living Arrangements in Western Europe: Does Cultural Origin Matter?" Journal of the European Economic Association, 5, 927–952.

[34] Giuliano, P., Spilimbergo, A. and Tonon, G. 2006. "Genetic, Cultural and Geographical Distances." IZA Discussion Paper No. 2229.

[35] Glick, R. and Rose, A. K. 2002. "Does a Currency Union Affect Trade? The Time Series Evidence." European Economic Review, 46 (June):1125–51.

[36] Glick, R. and Taylor, A. 2005. "Collateral Damage: Trade Disruption and the Economic Impact of War." The Review of Economics and Statistics, 92(1), 102-127.

[37] Gochman, C. S. 1991. "Interstate Metrics: Conceptualizing, Operationalizing, and Measuring the Geographic Proximity of States since the Congress of Vienna." International Interactions 17 (1): 93-112.

[38] Gokmen, G. 2011. "Clash of Civilizations: Impact of Culture on Militarized Interstate Dispute." Bocconi University, Mimeo.

[39] Guiso, L., Sapienza, P. and Zingales, L. 2003. "People's Opium? Religion and Economic Attitudes." Journal of Monetary Economics, 50, 225–282.

Tesi di dottorato ""Essays in Political and Institutional Economics""
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Sono comunque fatti salvi i diritti dell'università Commerciale Luigi Bocconi di riproduzione per scopi di ricerca e didattici, con citazione della fonte.

[40] Guiso, L., Sapienza, P. and Zingales, L. 2004. “The Role of Social Capital in Financial Development.” American Economic Review, 94, 526–556.

[41] Guiso, L., Sapienza, P. and Zingales, L. 2006. “Does Culture Affect Economic Outcomes?” Journal of Economic Perspectives, 20, 23–48.

[42] Guiso, L., Sapienza, P. and Zingales, L. 2008a. “Long Term Persistence.” University of Chicago, Working Paper.

[43] Guiso, L., Sapienza, P. and Zingales, L. 2008b. “Social Capital as Good Culture.” Journal of the European Economic Association, 6, 295–320.

[44] Guiso, L., Sapienza, P. and Zingales, L. 2009. "Cultural Biases in Economic Exchange." The Quarterly Journal of Economics, 124 (3): 1095-1131.

[45] Head, K. and Mayer, T. 2002. "Illusory Border Effects: Distance Mismeasurement Inflates Estimates of Home Bias in Trade." CEPII, Working Paper No 2002-01.

[46] Henderson, E., A. 1997. "Culture or Contiguity? Ethnic Conflict, the Similarity of States, and the Onset of War, 1820–1989." Journal of Conflict Resolution 41(5): 649–68.

[47] Henderson, E., A. 1998. "The Democratic Peace through the Lens of Culture, 1820–1989." International Studies Quarterly 42(3): 461–84.

[48] Henderson, E., A. and Tucker, R., M. 2001. "Clear and Present Strangers: The Clash of Civilizations and International Conflict." International Studies Quarterly 45: 317–38.

[49] Huntington, S. P. 1993a. "The Clash of Civilizations?." Foreign Affairs 72(3): 22-49.

[50] Huntington, S. P. 1993b. "If Not Civilizations, What? Paradigms of the Post-Cold War World." Foreign Affairs 72(5): 186–94.

[51] Huntington, S. P. 1998. "The Clash of Civilizations and the Remaking of the World Order." Simon & Schuster Ltd. West Garden Place Kendal Street London W2 2AQ.

[52] Huntington, S. P. 2000. "Try Again: A Reply to Russett, Oneal and Cox." Journal of Peace Research 37(5): 609–10.

[53] Ichino, A. and Maggi, G. 2000. “Work Environment and Individual Background: Explaining Regional Shirking Differentials in a Large Italian Firm.” The Quarterly Journal of Economics, 15(3), 1057–1090.

[54] Knack, S. and Keefer, P. 1997. “Does Social Capital Have an Economic Pay-Off? A Cross Country Investigation.” The Quarterly Journal of Economics, 112(4), 1251–1288.

[55] La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R. 1999. "The Quality of Government." Journal of Law, Economics and Organization 15(1), 222-279.

[56] Linders, G. M. and de Groot, H. L. F. 2006. “Estimation of the Gravity Equation in the Presence of Zero Flows,” Tinbergen Institute Discussion Paper.

[57] Martin, P., Mayer, T. and Thoenig, M. 2008. "Make Trade Not War?" Review of Economic Studies, 75, 865-900.

[58] McCallum, J. 1995. "National Borders Matter: Canada-US Regional Trade Patterns. " American Economic Review, 85 (3), 615-623.

[59] Melitz, J. 2008. "Language and Foreign Trade." European Economic Review, 52, 667-699.

[60] Nunn, N. 2007. “Relationship-Specificity, Incomplete Contract, and the Pattern of Trade.”

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Quarterly Journal of Economics, 122, 569–600.

[61] Nunn, N. and Puga, D. 2011. "Ruggedness: The Blessing of Bad Geography in Africa." Review of Economics and Statistics (forthcoming)

[62] Putnam, R. D. 1993. "Making Democracy Work." Princeton, NJ: Princeton University Press.

[63] Rauch, J. and Trindade, V. 2002. “Ethnic Chinese Networks in International Trade.” Review of Economics and Statistics, 84, 116–130.

[64] Riley, S. J., DeGloria, S., D. and Elliot, R. 1999. "A Terrain Ruggedness Index that Quantifies Topographic Heterogeneity." Intermountain Journal of Sciences, 5(1–4), 23–27.

[65] Rohner, D., Thoenig, M. and Zilibotti, F. 2011. "War Signals: A Theory of Trade, Trust and Conflict." CEPR Discussion Paper Series, No. 8352.

[66] Rose, A. K. 2000. "One Money, One Market: The Effect of Common Currencies on Trade." Economic Policy, 15 (April):7–33.

[67] Rose, A. K. 2004. "Do We Really Know That the WTO Increases Trade?" The American Economic Review, 94(1): 98-114.

[68] Rose, A. K. and van Wincoop, E. 2001. "National Money as a Barrier to International Trade: The Real Case for Currency Union." The American Economic Review, Vol. 91, No. 2, 386-390.

[69] Russett, B., M., Oneal, J., R. and Cox, M. 2000. "Clash of Civilizations, or Realism and Liberalism D‘ej´a Vu?" Journal of Peace Research, 37(5): 583–608.

[70] Silva, J. M. C. S. and Tenreyro, S. 2006. "The Log of Gravity." The Review of Economics and Statistics, 88(4): 641–658.

[71] Spolaore, E. and Wacziarg, R. 2009a. “The Diffusion of Development.” The Quarterly Journal of Economics, 124 (2): 469-529.

[72] Spolaore, E. and Wacziarg, R. 2009b. "War and Relatedness." NBER Working Paper Series, Working Paper 15095.

[73] Stinnett, D. M., Tir, J., Schafer, P., Diehl, P. F. and Gochman, C. 2002. "The Correlates of War Project Direct Contiguity Data, Version 3." Conflict Management and Peace Science 19 (2):58-66.

[74] Tabellini, G. 2007. "Culture and Institutions: Economic Development in the Regions of Europe.” IGIER Working Paper No. 292.

[75] Tabellini, G. 2008a. “The Scope of Cooperation.” The Quarterly Journal of Economics, 123, 905–950.

[76] Tabellini, G. 2008b. "Institutions and Culture." Journal of the European Economic Association, 6 (2–3), 255–294.

[77] Weber, M. 1958. "The Protestant Ethic and the Spirit of Capitalism." Translated by T. Parsons, (New York: Scribner’s Library).

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3 Effects of Capital Markets Shocks on Nonparticipants, Social Mobility and Inequality

Abstract

Whenever crises hit an economy issues of who is affected and how are hotly debated. In that respect, this paper is a stylized study of the effects of a shock in capital markets on nonparticipants, social mobility and inequality. To that end, we first present a theoretical model in which individuals endogenously determine whether to participate in capital markets and become an entrepreneur or just deposit their earnings with a bank. Once the theoretical model is set up, quantitative analyses follow. Our findings from simulations suggest that, contrary to the popular public opinion, inequality decreases on impact after a negative shock in capital markets. Therefore, this study suggests that the effects of a shock on inequality are not always straightforward. As a consequence, much more heed should be paid to short-term and long-term consequences of adverse shocks and further research is required.

JEL Classification: D31, D53, D63, E22, G01, J24.

Keywords: inequality, crisis, entrepreneurs, capital markets, depositors.

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Introduction

Analyzing the distributional impacts of economic crises is important and, unfortunately, an ever more pressing need. If policy makers are to intervene to help those most adversely affected, then they need to identify those who have been most harmed. To shed some light on this problem this paper presents a stylized study of the effects of a capital markets shock on nonparticipants, on social mobility and, more importantly, on inequality.

We start off with a theoretical model with a continuum of individuals. Every individual works and faces the decision of how to carry her earnings to the next period. Individuals differ in their entrepreneurial abilities and they endogenously determine whether to become an entrepreneur, borrow from the banks and take on an investment project; or become a depositor and deposit their earnings with banks. These are the two alternatives to carry over wealth to the next period. Once the investment decision is taken, population is split into two groups: entrepreneurs and depositors. In the next period, entrepreneurial productivities are realized and capital is produced, after which entrepreneurs sell their capital to firms for them to use it in production, and, in return, receive the price of capital, pay their debt back to the banks and consume. Depositors, on the other hand, receive the returns on deposits together with the interest that is tied to the productivity of entrepreneurs and consume.

Once the theoretical framework is set up and the equilibrium conditions are set out we run quantitative analyses to see the evolution of some of our variables of interest and look into the effects of a negative capital markets shock. Our findings suggest that inequality decreases on impact. Our findings are not necessarily in line with common public opinion; therefore they highlight the importance of a better understanding of the distributional issues during crises. Questions on short-run and long-run effects naturally arise and call for further, more in depth research before reaching any policy conclusions.

There have been numerous studies on the distributional effects of financial crises. For instance, Galbraith and Jiaqing (1999) ask what the consequences of financial crisis for inequality in manufacturing earnings are and show that crises typically generate increases in inequality, but more so in less developed countries, and more so in regions that are more liberal in their labor market policies. Friedman and Levinsohn (2001) analyze the impact of economic crisis on household welfare in Indonesia following the 1997 Asian currency crisis. For that purpose, they calculate simple measures of compensating variation and find that virtually every household was severely impacted, although it

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was the urban poor that fared the worst. Baldacci et al. (2002) study the impact of financial crises on the incidence of poverty and income distribution and empirically show that financial crises are associated with an increase in poverty and, in some cases, income inequality. Halac and Schmukler (2003, 2004) explore the channels through which financial crises affect income distribution. More specifically, they investigate the transfers from non-participants of the financial sector to those that are participants of the financial sector and suggest that financial transfers during crises are large and expected to increase income inequality. Naude and MacGee (2009) argues that the recent financial crisis, having sharply reduced the value of financial and housing assets, especially in the advanced economies, might be expected to lead to a reduction in global wealth inequality; however, they conclude that while the current crisis is likely to reduce global wealth inequality today, the long-term effects are less clear. Habib et al. (2010) conduct a microsimulation approach to assess the poverty and distributional effects of the crisis. They find increases in both the level and the depth of aggregate poverty and that income shocks are relatively large in the middle and bottom parts of the income distribution; however, they observe no significant impact of the crisis on aggregate inequality indexes. Some authors also asked the opposite question and questioned whether income inequality itself may have an impact on financial markets asking whether such inequality can lead to financial crises (see Brescia, 2010).

This study is also partly related to the literature on entrepreneurial abilities[60] and occupational choice.[61] Another strand of literature this paper relates to is on wealth distribution and distributional dynamics.[62]

The paper proceeds as follows. In order to have a better understanding of the model and the workings of our stylized economy we start off in Section 2 with the basic form of the model. In Section 3 we extend the basic model and diverge from the deterministic set up. What follows in Section 4 is an exercise to understand the implications of the model. To that end, we run simulations and see how our variables of interest evolve after a negative shock in capital markets. Finally, the last section provides some concluding remarks.

[60] See, for instance, Lucas (1978), Acemoglu (2001), Chari et al. (2005) and Martin and Taddei (2010).
[61] See, for instance, Quadrini (2000), Ghatak et al. (2001) and Clemens and Heinemann (2010).
[62] See, for instance, Stiglitz (1969), Banerjee and Newman (1993), Galor and Zeira (1993), Perotti (1993), Aghion and Bolton (1997), Piketty (1997) and De Nardi (2004).

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The Basic Model

As a starting point, we first introduce a simplified deterministic version of the model in order to better understand the workings of the economy.

We consider a heterogenous-agents overlapping generations model.[63] Heterogeneity of agents stems from differential entrepreneurial abilities. Time is discrete and goes from 0 to $+\infty$. Every generation consists of a continuum of households and the size of each generation is normalized to one.[64] Agents live for two periods, youth and old age. The objective of every generation is to maximize their old-age utility, which is nothing but their expected consumption when old. Formally, $U_t = E_t(c_{t+1})$, where U_t and c_{t+1} are utility and the old-age consumption of time t cohorts, respectively.

In a setup similar to that of Martin and Taddei (2010), we model the population as composed of two endogenously determined groups, entrepreneurs and depositors. In youth every individual inelastically provides unit labor input for the production process. In return, they receive a wage income. Once wages are received, agents need to decide on how to carry their wealth over to the next period. There are two alternatives available: use the storage technology of the banks to deposit wages or invest in capital. Individuals have the option to undertake an investment project and become an entrepreneur or decide otherwise and be a depositor. Entrepreneurs have access to credit market so that they can borrow and invest in capital.

Agents' decision whether to be an entrepreneur or a depositor takes place in the following fashion. Agents are indexed by j accordingly with their entrepreneurial abilities. The decision as to be an entrepreneur or not hinges on ex-ante heterogeneity of abilities. Individuals differ in their entrepreneurial skills and these skills translate directly into how successful the investment project they undertake is going to be. At the beginning of any period there is a random draw of productivity that assigns each individual a level of productivity and agents' skills are represented by the productivity, z, of their capital investment. Productivity levels are distributed uniformly across the interval $[\underline{z}, \overline{z}]$, with $\underline{z} > 1$ and $(\overline{z} - \underline{z}) = 1$. Entrepreneurial abilities are ranked in such a way that whenever individual j is more able than individual i the productivity of individual j is higher than the productivity of individual i, $z_j > z_i$.[65] Skill levels of agents play a decisive role in

[63] The basic over-lapping generations model is due to Samuelson (1958) whereas the version with capital accumulation is due to Diamond (1965).

[64] Throughout the text, households and agents are referred to interchangeably, meaning the same set of individuals in the economy.

[65] There is no investment in human capital. Abilities are given and cannot be improved upon. Akyol and Athreya (2003) show, for example, that increased investment in human capital lowers the long-run inequality.

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their entrepreneurial choice. That is to say that agents with high enough entrepreneurial skills will end up as an entrepreneur. Otherwise, if an individual is not skilled enough she would rather choose to deposit the wage income with a bank than invest it in capital.

As such, each and every entrepreneur in period t is endowed with an investment project of fixed size I.[66] Any entrepreneur j borrows from the bank the difference, B_t, between the size of the investment project, I, and the wage income, w_t, given $I > w_t$. Should the project be undertaken, $z_j \cdot I$ units of new capital are produced in period $t+1$ for every entrepreneur j. To state it differently, one unit of investment by entrepreneur j yields z_j units of new capital.[67] In turn, newly produced capital from every entrepreneur j is hired by firms in order to employ in production processes. Hence, firms combine the new capital from entrepreneurs together with the labor of the young of the new generation and produce output, after which a rental price of r_{t+1} on capital is paid to every entrepreneur. As a consequence, entrepreneurs who have invested in capital at time t collect returns on their capital at time $t+1$, pay their debt back to the bank and consume what is left.

Individuals who have opted to be a depositor, on the other hand, get a wage income in the first period of their lives and save it all through a bank. Their savings are lent to entrepreneurs via banks, for which they receive a gross deposit interest , r^D_{t+1}, in period $t+1$ and consume in the second period of their lives.

Figure 1 summarizes the workings of this economy.

Firms

The treatment of firms is very standard. There are many firms that combine capital, K, and labor, L, in a standard concave production function that exhibits constant-returns-to-scale technology and produce good Y.[68] Thus results the functional form $Y_t = F(K_t, L_t)$, which is also assumed to satisfy Inada conditions.

Firms' problem is a usual one. They maximize profit: $F(K_t, L_t) - w_t \cdot L_t - r_t \cdot K_t$. In competitive markets this process leads to the well-known first order conditions suggesting capital and labor earn their marginal products, $w_t = F_L(K_t, L_t)$ and $r_t =$

[66] Having a fixed investment size per agent is for simplicity; this assumption does not render total investment fixed as it varies with the number of entrepreneurs in the economy.

[67] Notice that the realization of time $t+1$ capital per unit of investment depends on the individual specific productivities that are randomly assigned; and issues of effort, moral hazard and such are assumed away.

[68] The initial positive level of capital is taken as given and is equally owned by all old individuals. Moreover, we also assume that capital investment is a sunk cost; that is, depreciation of capital is one-to-one.

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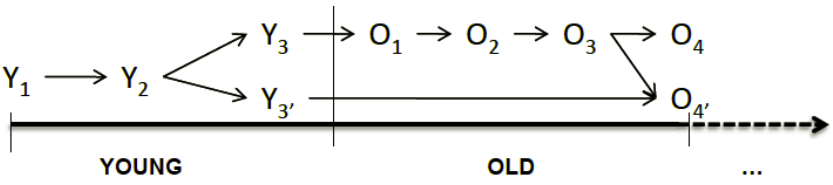
$F_K(K_t, L_t)$.



Y_1: Every individual provides labor inelastically. Firms combine labor, *L*, and capital, *K*, in production. In turn, wages, *w*, and price of capital, *r*, are paid out.
Y_2: Once the agents received wages, they are to decide how to carry their wealth over to the next period and to choose one of the two ways.
Y_3 : Become an entrepreneur, take a loan, *B*, on top of the wage income and undertake an investment project, *I*, to gain returns next period.
$Y_{3'}$: Deposit your wage with a bank in order to receive interest, r^D, on it next period.
O_1: Given the total investment, *I*, made at time *t* and the fraction of entrepreneurs, productivity of investment is determined and new capital, $z \cdot I$, is produced.
O_2 : Newly produced capital and the labor of the young are hired by firms and production takes place.
O_3: Entrepreneurs are paid the price of capital, *r*.
O_4: Entrepreneurs pay back their debt with interest, $r^B \cdot B$, to the banks and consume the net of their returns, $r \cdot z \cdot I - r^B \cdot B$.
$O_{4'}$: Banks receive the loan payments from the entrepreneurs and pay their depositors who, in turn, consume the deposit returns, $r^D \cdot w$.

Figure 1: The Evolution of the Economy

More concretely, if we exploit the following Cobb-Douglas functional form $Y_t = K_t^{\alpha} \cdot L_t^{1-\alpha}$ with $\alpha \in (0,1)$, together with the inelasticity of unit labor supply assumption, that is $L_t = 1$, we can describe the wage and the rental price of capital as a function of capital and the parameter α :

$$w_t = (1-\alpha) \cdot K_t^{\alpha} \text{ and } r_t = \alpha \cdot K_t^{\alpha-1} \tag{3.1}$$

Intermediaries

Banks have a very limited role in this economy.[69] They collect wages from depositors in period t in return of a promise to pay back an interest factor of r_{t+1}^D on their deposits next period.

With the deposits collected banks sign loan contracts with entrepreneurs. They loan B_t

[69] See Diamond and Dybvig (1983), Diamond (1984), Bhattacharya and Thakor (1993), Diamond (1996) and Freixas and Rochet (2008), among others, for a discussion on the rationale for the existence and the role of banks.

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to each agent that has decided to be an entrepreneur and collect a gross return, r^B_{t+1}, on that loan next period, provided that the size of the investment project is greater than the wage income, $I > w_t$ such that $B_t = I - w_t$.

Following Rothschild and Stiglitz (1976) we assume perfect competition among banks in that there is free entry. Moreover, competition in the credit market is designed as a two-stage screening. First, banks offer a menu of loan contracts that are tied to each level of productivity. Second, agents who opt to be an entrepreneur apply for the loan contract that fits them best. Banks are identical in the sense that they all get the same share of the deposits and the same share of loan contracts. Free entry and perfect competition will ensure that contracts signed in competitive equilibrium will make zero profits.

Households

Households are indexed by $j \in J_t$ and they are heterogeneous across their entrepreneurial skills. Agent specific entrepreneurial abilities are represented as a continuum of productivity levels uniformly distributed across the support $[\underline{z}, \overline{z}]$ that allow us to rank individuals accordingly with their abilities. More specifically, for every individual $j \in J_t$ there exists an assigned productivity z_j over the interval $[\underline{z}, \overline{z}]$ and agents' abilities can be ranked with more able individuals having a higher productivity. As such, if agent j is more able than agent i, then agent j has a higher productivity than agent i; $z_j > z_i$.

All individuals provide labor in the first period of their lives in return for a wage, w_t. Additionally, taking her productivity into account an agent considers whether to take an investment project. Hence, the problem of an agent comes down to weigh the benefits of becoming an entrepreneur against the gains from being a depositor. Accordingly, in period t, each agent j that decides to be an entrepreneur receives an investment project of fixed size I financed by the bank loans B_t, given that $I > w_t$, which implies $I = B_t + w_t$. Then, in the next period, in accordance with entrepreneur j's productivity, $z_j \cdot I$ units of capital are to be produced, upon which she receives a rental price r_{t+1}, subsequently pays back the debt with interest, $r^B_{t+1}(j) \cdot B_t$, and consumes.

More formally, the profit from being an entrepreneur for individual j would be

$$\pi_{j,t}(z_j, B_t, r^B_{t+1}(j)) = r_{t+1} \cdot z_j \cdot I - r^B_{t+1}(j) \cdot B_t \tag{3.2}$$

Net return of an entrepreneur j depends on her ability, z_j, returns on capital next period, r_{t+1}, and the cost of loans received from banks.

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In case an individual decides to be a depositor, on the other hand, she would deposit her wage of w_t with a bank this period and get a net of $r^D_{t+1} \cdot w_t$ next period to consume.

The above agents' decision problem can be summarized by the following:

$$\max \left\{ r_{t+1} \cdot z_j \cdot I - r^B_{t+1}(j) \cdot B_t ; r^D_{t+1} \cdot w_t \right\}$$

Equilibrium

As aforementioned, labor is provided by all young of a generation whereas the capital stock is accumulated through the investment entrepreneurs have made in the previous period. Let us call λ^E_t the size of the entrepreneurs in the population in period t and λ^D_t the fraction of depositors, such that $\sum_i \lambda^i_t = 1, i = D, E$. Therefore, given the size of entrepreneurs and the investment endowment per entrepreneur, I, the total investment will be $\lambda^E_t \cdot I$.

In addition, production of capital in period $t+1$ not only depends on the total investment in capital but also on the productivity of all that investment in that the fraction of output that is devoted to investment will result in future capital stock only to the extent of the total productivity of such investment. Together with the equilibrium conditions that are yet to be determined, the total amount of new capital produced by the entire range of entrepreneurs will be equal to:

$$K_{t+1} = \int_{\widehat{z}_t}^{\overline{z}} z_j \cdot I \cdot dz_j \tag{3.3}$$

where $\widehat{z}_t$ is the critical level of productivity above which individuals opt to be an entrepreneur.[70]

This equation will allow us to see how the economy evolves once the critical level of productivity is determined.

In order to decide between being an entrepreneur or a depositor agents need to weigh the

[70] Equation (3.3), that determines the evolution of capital, combined with the equilibrium threshold productivity given by equation (3.10) can be shown to be also equal to a function of investment per entrepreneur, the size of entrepreneurs and the mean productivity of total investment, which can be formally expressed as:

$$K_{t+1} = E(z_t \mid \widehat{z}) \cdot \lambda^E_t \cdot I$$

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benefits of becoming an entrepreneur against the gains from depositing their earnings. Therefore, self-selection criterion for an individual to become an entrepreneur must be such that she makes at least as much gains as she would by depositing her earnings.[71] This can be formulated as follows:

$$\pi_{j,t}(z_j, B_t, r^B_{t+1}(j)) = r_{t+1} \cdot z_j \cdot I - r^B_{t+1}(j) \cdot B_t \geq r^D_{t+1} \cdot w_t \tag{3.4}$$

The above self-selection criterion[72] must hold with equality for the marginal individual that is indifferent between being an entrepreneur and a depositor. This allows us to determine a threshold level of productivity above which all individuals undertake their respective investment projects. We call this critical level of productivity in period t $\widehat{z}_t$.

In addition, equilibrium in a competitive banking sector is defined as a set of contracts such that no contract in the equilibrium set makes negative expected profits and there is no contract outside the equilibrium set that will make nonnegative profits. Furthermore, we assume that although individuals cannot observe each others' characteristics, banks are able to observe the characteristics of each borrower in that there is no asymmetric information.[73] The condition that every entrepreneur must have a return at least as big as the returns on deposits assures us that capital returns of entrepreneurs should be greater than their debt so that every entrepreneur is able to pay back her loan with interest. Additionally, perfect competition will prevent banks from making profits and this will drive the loan rate down to the deposit rate. Hence, banks charge a common factor of r^B_{t+1} on every loan B_t that is equal to banks' marginal cost, so that interest factors charged on loans are not individual specific anymore. As such, banks' return per loan from an entrepreneur j must be equal to the interest factor they pay on deposits:[74]

$$r^B_{t+1} = r^D_{t+1} \tag{3.5}$$

In order to determine the threshold ability for the marginal individual that is indifferent between investing in capital and depositing, self-selection criterion should hold with equality. Individuals above the threshold ability will opt for being an entrepreneur and

[71] Self-selection criterion allows us to make saving endogeneous and potentially time-varying.
[72] Self-selection criterion could alternatively be called incentive compatibility criterion of an entrepreneur.
[73] For examples on asymmetric information in the credit market see, among others, Townsend (1979), Stiglitz and Weiss (1981), Besanko and Thakor (1987) and De Meza and Webb (1987). See also Bernanke and Gertler (1990) for an illustration of the relevance of asymmetric information in financial markets to the macroeconomy.
[74] Since we assumed investment to be a sunk cost, repayment could have been 0 should the investment project fail, but with non-zero productivity levels default risk is ruled out. Note also that there is no strategic defult, i.e. entrepreneurs do not willingly default on their loan.

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the ones below the threshold ability will be depositors. Accordingly, banks' zero-profit condition combined with the self-selection criterion will allow us to have the threshold productivity as:

$$\widehat{z}_t = \frac{r^D_{t+1}}{r_{t+1}} \tag{3.6}$$

Intuitively, this is nothing but a statement of the optimality condition saying that marginal return from investment should equal marginal return from deposits.

For every threshold productivity we can determine a marginal individual who is indifferent between being an entrepreneur and a depositor, formally $\widehat{j_t} = \min\{j \in J_t : z_j \geq \widehat{z}_t\}$, above whose productivity level every agent is an entrepreneur; and from which we can determine the shares of the entrepreneurs and depositors in the population, which are λ^D_t and λ^E_t, respectively. We can relate depositors size to the threshold productivity as follows:

$$\lambda^D_t = \frac{\widehat{z}_t - \underline{z}}{\overline{z} - \underline{z}} = \widehat{z}_t - \underline{z} \tag{3.7}$$

given $(\overline{z} - \underline{z}) = 1$.

This tells us that the higher the threshold ability for being an entrepreneur is, the smaller number of entrepreneurs there will be, hence, a higher share of depositors in the population will result.

As described in the preceding discussion, banks collect deposits from depositors and distribute an equal share of total deposits to each entrepreneur taking loans; then, in equilibrium, supply of funds should equal demand for funds, which gives us the credit market clearance:

$$\lambda^D_t \cdot w_t = \lambda^E_t \cdot B_t \tag{3.8}$$

This also gives us the equilibrium condition that total savings should be equal to total investment in a closed economy.

Consequently, from equation (3.8) we can write down the depositors' share of total population as:

$$\lambda^D_t = 1 - \frac{w_t}{I} \tag{3.9}$$

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This will, in turn, allow us to derive the threshold productivity when combined with equation (3.7):

$$\widehat{z}_t = \overline{z} - \frac{w_t}{I} \tag{3.10}$$

If we combine the credit market equilibrium condition with the self-selection criterion we can write the deposit factor as:

$$r^D_{t+1} = r_{t+1} \cdot \left(\overline{z} - \frac{w_t}{I}\right) \tag{3.11}$$

Finally, the evolution of this economy will be determined by the following law of motion of capital:[75]

$$K_{t+1} = \left[\overline{z} - \frac{(1-\alpha)\cdot K_t^{\alpha}}{2\cdot I}\right] \cdot (1-\alpha)\cdot K_t^{\alpha} \tag{3.12}$$

which can be shown to be increasing and to be concave as long as wages do not exceed the size of the investment project I.[76]

The Model with Productivity Distributions

Next, we introduce heterogeneity across agents in a non-deterministic way and we randomly assign each individual a distribution of productivity levels. As in the basic model, we have a continuum of agents indexed by $j \in J_t$. Individuals' differential entrepreneurial skills are translated through uniform distribution functions that directly affect how successful the investment project they undertake is going to be. Therefore, the decision whether to be an entrepreneur hinges on ex-ante heterogeneity of productivity distributions.

---

[75] It is straightforward to see from the market clearing equation that total investment $\lambda^E_t \cdot I$ will be equal to the wage.

[76] A sufficient condition for wages to stay below I is:

$$I > \left(\overline{z} - \frac{1}{2}\right)^{\frac{\alpha}{1-\alpha}} \cdot (1-\alpha)^{\frac{1}{1-\alpha}}$$

This result follows from considering the fact that the maximum steady-state level of capital cannot be greater than:

$$\left[\left(\overline{z} - \frac{1}{2}\right)\cdot(1-\alpha)\right]^{\frac{1}{1-\alpha}}$$

We assume this holds throughout and wages never exceed the size of the investment.

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In each and every period there is random draw of distributions that are assigned to the agents; hence, each agent j corresponds to a uniform distribution of productivity with pdf $f(z_j)$ and mean $\widetilde{z_j}$. Moreover, there exists a support $\left[\underline{z_j}, \overline{z_j}\right]$ for each pdf $f(z_j)$, that is $z_j \sim U\left[\underline{z_j}, \overline{z_j}\right]$. A constant spread of size σ for each agent j is assumed, i.e. $\forall j \in J_t, \left(\overline{z_j} - \underline{z_j}\right) = \sigma$.

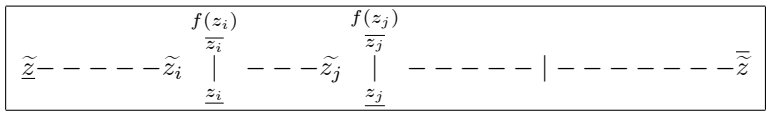

Figure 2**:** Productivity Distributions of Individuals with Horizontal Axis Reflecting Mean Productivities

Agents base their investment decisions on their mean productivity when they take their decisions. Agents' mean productivity levels are distributed uniformly across the interval $\left[\underline{\widetilde{z}}, \overline{\widetilde{z}}\right]$, and their respective standings are such that whenever individual j is said to be more able than individual i the mean productivity of individual j is higher than the mean productivity of individual i, that is $\widetilde{z_j} > \widetilde{z_i}$. Figure 2 above displays a visual exposition of the productivity distributions of the individuals and their ranking accordingly with their mean productivities; where $\overline{\widetilde{z}}$ and $\underline{\widetilde{z}}$ correspond to the maximum and the minimum mean productivities of the agents (the most and the least skilled agents), respectively; and where every agent j's uniform pdf $f(z_j)$ is distributed over $\left[\underline{z_j}, \overline{z_j}\right]$ with mean $\widetilde{z_j}$.

In sequence, once an agent takes an investment decision she is endowed with an investment project of fixed size I. Should a project be undertaken $\widetilde{z_j} \cdot I$ units of capital are expected to be produced in period $t+1$ for every entrepreneur j. In other words, one unit of output devoted to investment yields on average $\widetilde{z_j}$ units of new capital. Ultimately, the entrepreneur rents the newly produced capital to firms in return for rental price.

Firms

The treatment of firms is just as in the previous section of the basic model, consequently, the results carry on. As such, $w_t = (1-\alpha) \cdot K_t^{\alpha}$ and $r_t = \alpha \cdot K_t^{\alpha-1}$ hold.

Intermediaries

Same treatment of perfectly competitive banking sector as in the basic model is main-

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tained with a difference that in the current stochastic case free entry and perfect competition will ensure that contracts signed in competitive equilibrium will make zero "expected" profits in that they break even on average. More explicitly, when the realized productivity of entrepreneur j is high enough, the bank can get paid back the entire sum of the loan together with the interest. Otherwise, if the productivity is not high enough, bank seizes all that the entrepreneur has.[77] Hence, the gains of the bank from entrepreneur j can be formally summarized as follows:

$$\pi_{t+1}^{Bank}(j) = \min\left\{r_{t+1} \cdot z_{j,t+1} \cdot I; r_{t+1}^{B}(j) \cdot B_t\right\}$$

Households

All youth supplies labor inelastically in return for wage, w_t. Taking her average productivity into account an agent has to decide whether to take an investment project. The agent has to weigh the benefits of investing in capital against the gains from depositing her earnings. In period t, each entrepreneur j receives an investment project of fixed size I, and correspondingly, takes a loan of size B_t on top of her wage income in order to finance the project, given $I > w_t$. Then, in the next period, in accordance with her average productivity, $\widetilde{z}_j \cdot I$ units of capital are expected to be produced. She hires the new capital to the firms in return for the rental price r_{t+1}, pays back the loan with interest, $r_{t+1}^{B}(j) \cdot B_t$, and consumes. Hence, expected net gain of individual j from undertaking an investment project depends on her ability, z_j, returns on capital next period, r_{t+1}, and the cost of bank loans.

In case the agent opted for depositing her earnings, on the other hand, she would deposit wage w_t with a bank this period and receive a net of $r_{t+1}^{D} \cdot w_t$ next period to consume.

The above agent's decision problem can be formally summarized as choosing the maximum expected net return:

$$\max\left\{\widetilde{\pi}_{t+1}^{Entrepreneur}; r_{t+1}^{D} \cdot w_t\right\}$$

Equilibrium Analysis

The realization of entrepreneur's productivity determines what she ends up with in the

[77] This property can be thought of as entrepreneurs having limited liability.

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next period. If her productivity is high enough, entrepreneur can pay the loan back to the bank and consume the remaining. On the other hand, if the productivity is not high enough, the bank seizes all the returns leaving the entrepreneur with nothing. In either of the two cases just described the net returns to an entrepreneur j can be summarized by the following functional form:

$$\pi_{t+1}^{Entrepreneur}(j) = \max\left\{r_{t+1} \cdot z_{j,t+1} \cdot I - r_{t+1}^{B}(j) \cdot B_t; 0\right\}$$

To put it more clearly we consult Figure 3. As is depicted in Figure 3, entrepreneur's returns are wholly seized by the bank up to a critical point of productivity below which entrepreneur's revenues are not sufficient enough to pay the loan back, in which case no matter what the return to the entrepreneur is it goes directly to the bank as payment. We denote this level of break-even productivity as z^{BE}. Clearly, for the productivity levels above the break-even productivity, z^{BE}, banks solely receive the actual debt with interest from the entrepreneurs and the entrepreneur keeps the remaining of the returns as profit.

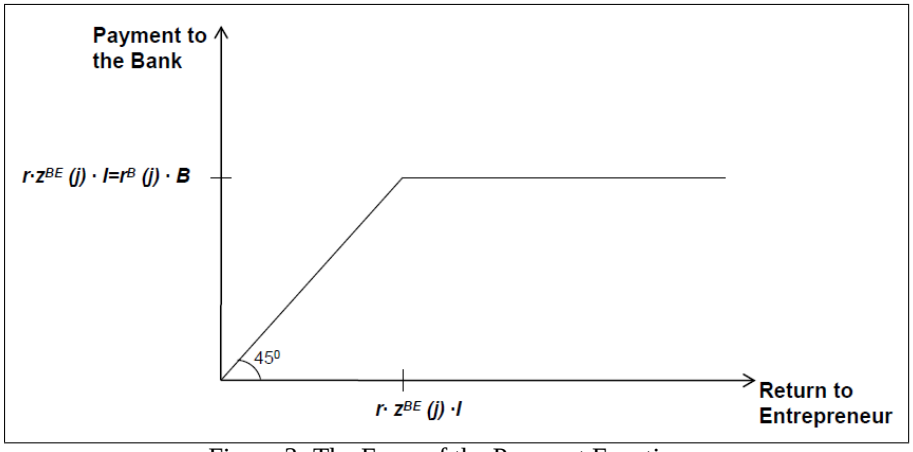

Figure 3: The Form of the Payment Function

Proposition 3.1 *For any given borrowing interest factor r^B, there is a critical value z^{BE} such that any individual j borrows from the bank if and only if $\widetilde{z}_j > z^{BE}$.*

Proof. This follows immediately from borrowers expected net return, that is:

$\max\left\{r_{t+1} \cdot \widetilde{z}_{j,t+1} \cdot I - r_{t+1}^{B}(j) \cdot B_t; 0\right\}$. ■

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As discussed earlier, equilibrium in a competitive banking sector is defined as a set of contracts such that no contract in the equilibrium set makes negative expected profits and there is no contract outside the equilibrium set that will make nonnegative profits. Banks are able to observe the characteristics of each borrower and they try to break-even on average. As such, banks' expected profits from any entrepreneur j must be equal to zero. On one hand, as long as the productivity of the entrepreneur is not high enough to honor her debt the bank will seize whatever returns she has. On the other hand, if entrepreneur's productivity is high enough, she will be able to pay the debt back to the bank. Therefore, bank's zero-expected-profit condition will be as follows:

$$\widetilde{\pi}_{t+1}^{Bank}(j) = r_{t+1} \cdot I \cdot \int_{\underline{z}_j}^{z_j^{BE}} z_j \cdot f(z_j) dz_j + \int_{z_j^{BE}}^{\overline{z}_j} r_{t+1}^{B}(j) \cdot B_t \cdot f(z_j) dz_j - r_{t+1}^{D} \cdot B_t = 0 \quad (3.13)$$

which can be more simply expressed as:

$$\widetilde{\pi}_{t+1}^{Bank}(j) = \left(\frac{z_j^{BE} - \underline{z}_j}{\sigma} \right) \cdot r_{t+1} \cdot I \cdot \left(\frac{z_j^{BE} + \underline{z}_j}{2} \right) + \left(\frac{\overline{z}_j - z_j^{BE}}{\sigma} \right) \cdot r_{t+1}^{B}(j) \cdot B_t - r_{t+1}^{D} \cdot B_t = 0 \quad (3.14)$$

given $\overline{z}_j - \underline{z}_j = \sigma$.

Furthermore, self-selection criterion suggests that expected gains from entrepreneurship must be at least as big as the returns on deposits:

$$\widetilde{\pi}_{t+1}^{Entrepreneur}(j) \geq r_{t+1}^{D} \cdot w_t \quad (3.15)$$

Given Proposition 1 an entrepreneur will expect to earn a positive average net return as long as the productivity is above the break-even productivity z^{BE}; in that respect, agent's problem will take the following formal summary form:

$$\widetilde{\pi}_{t+1}^{Entrepreneur}(j) = \max \left\{ r_{t+1} \cdot \widetilde{z}_{j|z_j \geq z_j^{BE}} \cdot I - r_{t+1}^{B}(j) \cdot B_t; 0 \right\} \quad (3.16)$$

Then the expected net profit to any entrepreneur j will be:

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$$\widetilde{\pi}_{t+1}^{Entrepreneur}(j) = \int_{z_j^{BE}}^{\overline{z}_j} \left(r_{t+1} \cdot z_j \cdot I - r_{t+1}^{B}(j) \cdot B_t\right) \cdot f(z_j) dz_j \tag{3.17}$$

which is nothing but a statement of positive net returns for the productivity levels above break-even productivity plus zero net returns to entrepreneur for the productivity levels below break-even productivity.

The expression above in equation (3.17) can be simplified as:

$$\widetilde{\pi}_{t+1}^{Entrepreneur}(j) = \left(\frac{\overline{z}_j - z_j^{BE}}{\sigma}\right) \cdot \left[r_{t+1} \cdot \left(\frac{\overline{z}_j + z_j^{BE}}{2}\right) \cdot I - r_{t+1}^{B}(j) \cdot B_t\right] \tag{3.18}$$

Combined with the bank's zero-expected-profit condition entrepreneur's expected profit takes the following form:

$$\begin{aligned} \widetilde{\pi}_{t+1}^{Entrepreneur}(j) \quad = \quad & \left(\frac{\overline{z}_j - z_j^{BE}}{\sigma}\right) \cdot r_{t+1} \cdot \left(\frac{\overline{z}_j + z_j^{BE}}{2}\right) \cdot I - r_{t+1}^{D} \cdot B_t \\ & + r_{t+1} \cdot \left(\frac{\left(z_j^{BE}\right)^2 - \underline{z}_j^2}{2 \cdot \sigma}\right) \cdot I \end{aligned}$$

$$= \frac{r_{t+1} \cdot I}{2 \cdot \sigma} \cdot \left(\overline{z}_j^2 - \left(z_j^{BE}\right)^2 + \left(z_j^{BE}\right)^2 - \underline{z}_j^2\right) - r_{t+1}^{D} \cdot B_t = r_{t+1} \cdot I \cdot \widetilde{z_j} - r_{t+1}^{D} \cdot B_t \tag{3.19}$$

Moreover, we know that self-selection criterion of equation (3.15) holds with equality for the marginal individual; which is to say that equation (3.19) above is equal to $r_{t+1}^{D} \cdot w_t$ for the marginal individual. Formally:

$$r_{t+1} \cdot I \cdot \widehat{\widetilde{z}}_t - r_{t+1}^{D} \cdot B_t = r_{t+1}^{D} \cdot w_t \tag{3.20}$$

where $\widehat{\widetilde{z}}$ defines the threshold level of mean productivity. From the above equation we can write the mean threshold productivity as:

$$\widehat{\widetilde{z}}_t = \frac{r_{t+1}^{D}}{r_{t+1}} \tag{3.21}$$

which is nothing but the optimality condition for the marginal individual saying that average marginal return from investment should equal marginal return from deposits.

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For every threshold productivity we can determine the marginal individual as $\widehat{j}_t = \min\left\{j \in J_t : \widetilde{z}_j \geq \widehat{\widetilde{z}}_t\right\}$. Hence, the size of the depositors, λ_t^D, can be related to the threshold productivity as:

$$\lambda_t^D = \frac{\widehat{\widetilde{z}}_t - \underline{\widetilde{z}}}{\overline{\widetilde{z}} - \underline{\widetilde{z}}} = \widehat{\widetilde{z}}_t - \underline{\widetilde{z}} \tag{3.22}$$

with $\left(\overline{\widetilde{z}} - \underline{\widetilde{z}}\right) = 1$.

This tells us that the higher the threshold ability for being an entrepreneur is, the smaller number of entrepreneurs there will be, hence, a higher share of workers in the population will result.

Market clearing condition dictates that credit market should clear in equilibrium; and therefore, supply of funds should be equal to the demand for funds:

$$\lambda_t^D \cdot w_t = \lambda_t^E \cdot B_t \Longrightarrow \lambda_t^D = 1 - \frac{w_t}{I} \tag{3.23}$$

which gives us the size of depositors as the ratio of loan to investment. The size of the depositors is positively related to this ratio; which means that the bigger the amount entrepreneurs need to borrow in order to invest the smaller is the fraction of entrepreneurs; hence, the bigger is the fraction of depositors.

If, in turn, we use depositors' size to pin down $\widehat{\widetilde{z}}_t$, we will have the mean threshold productivity as:

$$\widehat{\widetilde{z}}_t = \overline{\widetilde{z}} - \frac{w_t}{I} \tag{3.24}$$

We combine the credit market equilibrium condition with the self-selection criterion and write the deposit factor as:

$$r_{t+1}^D = r_{t+1} \cdot \left(\overline{\widetilde{z}} - \frac{w_t}{I}\right) \tag{3.25}$$

Lastly, absent any disturbances the evolution of this economy can be described by the following law of motion:

$$K_{t+1} = \int_{\widehat{\widetilde{z}}}^{\overline{\widetilde{z}}} \widetilde{z}_j \cdot I \cdot d\widetilde{z}_j \tag{3.26}$$

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The above equation for total investment combined with equation (3.25) will yield the evolution of this economy in the following way:

$$K_{t+1} = \left[\bar{\bar{z}} - \frac{(1-\alpha)\cdot K_t^{\alpha}}{2\cdot I}\right]\cdot(1-\alpha)\cdot K_t^{\alpha} \tag{3.27}$$

which can be shown to be increasing and concave.[78]

Moreover, it is important to notice that what we have here is the capital at the aggregate level; as such, though capital production is stochastic at the individual level, idiosyncratic shocks cancel out at the aggregate level since we have a continuum of agents.

An Aggregate Shock

In this section we look at the implications of our theoretical model by means of numerical simulations. To that end, we decompose the uncertainty in productivity levels into an aggregate and an idiosyncratic component while preserving all the properties discussed earlier regarding the probability distributions and the ranking of abilities according to mean productivities.[79]

When we want to pin down the total capital at the aggregate level in this economy as in equation (3.26), absent any aggregate shocks idiosyncratic disturbances cancel out at the aggregate level since we have a continuum of agents and the resulting law of motion for capital is given in equation (3.27). Let us now decompose the disturbance term to the productivity into an aggregate component A_{t+1} and an idiosyncratic component $\phi_{j,t+1}$, preserving all the previous properties with respect to distributions. We apply the decomposition of the disturbance term to equation (3.26) combined with equation (3.24) in order to acquire the total capital; and, in turn, idiosyncratic components of the disturbances to the productivity cancel out for we have a continuum of agents and the resulting evolution of capital takes the following form that includes the aggregate

[78] As in footnote 76, we assume I to be always greater than the wage. A sufficient condition is:

$$I > \left(\bar{\bar{z}} - \frac{1}{2}\right)^{\frac{\alpha}{1-\alpha}}\cdot(1-\alpha)^{\frac{1}{1-\alpha}}$$

This result follows from considering the fact that the maximum steady-state level of capital cannot be greater than:

$$\left[\left(\bar{\bar{z}} - \frac{1}{2}\right)\cdot(1-\alpha)\right]^{\frac{1}{1-\alpha}}$$

[79] For an example on stochastic capital see, for instance, Acemoglu and Zilibotti (1997) and Azariadis (2001).

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component of the disturbance term:

$$K_{t+1} = \left[A_{t+1} + \bar{\tilde{z}} - \frac{(1-\alpha) \cdot K_t^{\alpha}}{2 \cdot I} \right] \cdot (1-\alpha) \cdot K_t^{\alpha} \tag{3.28}$$

Therefore, the equilibrium conditions are pinned down by equations (3.1), (3.23), (3.24), (3.25) and (3.28). Once the equilibrium is determined we can run analyses on the evolution of some of the variables in this economy when there is a shock in the capital market.

Next, before going further and scrutinizing our variables of interest we look at the effects of a negative shock in the capital markets on this economy as a whole. For this purpose we take baseline parameter values as in Table 1 and assume that aggregate shock follows an AR(1) process: $A_{t+1} = \rho \cdot A_t + e_{t+1}$, where e is a white noise disturbance and ρ is a persistence term.

Table 1. Baseline Parameterization

$\boldsymbol{Parameter}$	$\boldsymbol{Description}$	$\boldsymbol{Value}$
α	Capital's share in production	0.33
$\bar{\tilde{z}}$	Average productivity of the most able individual	2
I	Fixed investment endowment	1
ρ	Persistence of the aggregate shock	0.95

Figure 4 shows us how this economy evolves after a negative capital markets shock. As expected by the neoclassical theory, a decrease in capital corresponds to an increase in the price of capital and a decrease in the price of labor. What is interesting to notice here is that even though there is a reduction in wages, the increase in interest factor is big enough to render depositing attractive relative to entrepreneurship, even more so than before the shock occurs. We see this through the increase in the productivity of the marginal investor after the shock. This is because of the reduction in the wage to investment ratio which implies that the amount entrepreneurs need to borrow in order to invest is higher now, and therefore, only the agents with a greater productivity can afford to bear higher borrowing risks. Also because returns to depositing are higher now for an individual to opt for entrepreneurship she must have better entrepreneurial skills.

Now we look at the evolution of two of our variables of interest, deposit earnings and social mobility.

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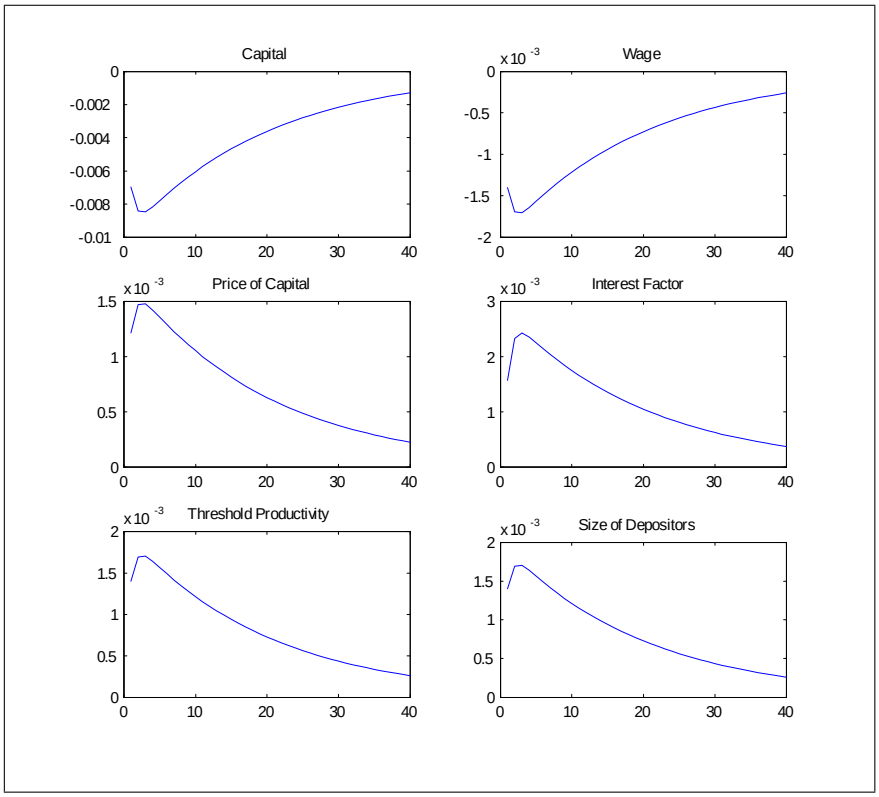

Figure 4: Evolution of the Economy after a Negative Shock in Capital Markets

Deposit earnings are defined as the wage deposited with the bank together with the interest it returns after the end of the deposit period, which is formally defined as:

$$depositearnings = r^D_{t+1} \cdot w_t$$

Let us also define social mobility as the ratio of the fraction of depositors in the population to the fraction of entrepreneurs in the population, which can be formally written as below:

$$\frac{\lambda^D_t}{\lambda^E_t} = \frac{I}{w_t} - 1$$

As discussed above the reduction in wages should be compensated by the increase in the interest factor for the productivity of the marginal investor to be higher after the shock; as such, we see down below in the upper panel of Figure 5 an increase in deposit

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earnings after the shock, which confirms what was hypothesized previously

As depicted in the bottom panel of Figure 5 the relative size of the depositors with respect to entrepreneurs increases after the negative capital markets shock. The increase in the relative size of depositors is due to the reduction in wages. As wages are lower after the shock, the amount required to be borrowed in order to take on an investment project is much higher; therefore, there are less and less individuals with high enough entrepreneurial skills to compensate with a high enough return on the investment.

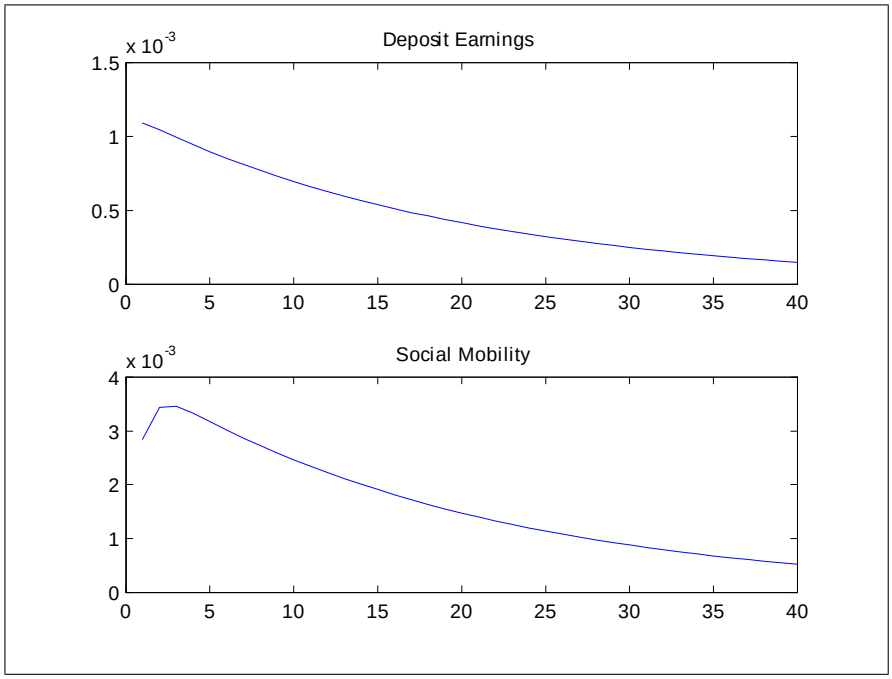

Figure 5: Evolution of the Deposit Earnings and Social Mobility after a Negative Shock in Capital Markets

Lastly, we define inequality as the ratio of the total earnings of entrepreneurs to that of depositors:

$$inequality = \frac{r_{t+1} \cdot K_{t+1} - r^D_{t+1} \cdot w_t \cdot \lambda^D_t}{r^D_{t+1} \cdot w_t \cdot \lambda^D_t}$$

We see in Figure 6 below that, contrary to the popular view, inequality decreases on impact after a negative shock in capital markets. This is due, firstly, to the reduction in capital and ,secondly, to the increase in interest factor. Depositors earn more now with

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respect to entrepreneurs as the increase in interest factor is big enough to make up for the reduction in wages. On the other hand, the increase in the price of capital is not big enough to make up for the reduction in capital.

This is not to say that inequality decreases also in the long run. What we only say is that inequality goes down at least on impact; however, long-term effects remain ambiguous. The way long-term effects are shaped requires further research together with the channels through which authorities intervene and perturb the long-run consequences.

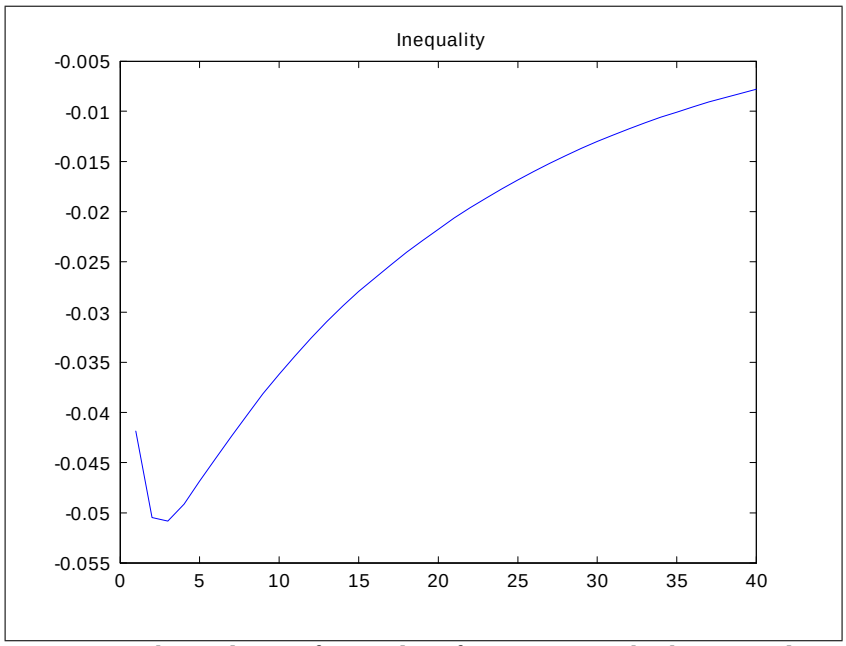

Figure 6: The Evolution of Inequality after a Negative Shock in Capital Markets

Conclusion

We presented a stylized model in order to understand the effects of a negative shock in capital markets on nonparticipants and on inequality in particular. We, first, presented our theoretical model and then looked at the effects of a negative shock via simulations. We find that, contrary to the common public opinion, a negative capital markets shock decreases inequality. This might, of course, reflect only the short term effects, but we, at least, suggest that a priori popular public opinion as regards to the issues of inequality

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might be misleading and further scrutiny is necessary. The long-term effects are also far from clear and more research is needed. As Naude and MacGee (2009) argues the recent financial crisis, having sharply reduced the value of financial and housing assets, especially in the advanced economies, might be expected to lead to a reduction in global wealth inequality; however, while the current crisis is likely to reduce global wealth inequality today, the long-term effects are less clear.

This also leaves another open question. Some authors provide evidence for the negative long-term effects on inequality of capital market shocks (see, for instance, Galbraith and Jiaqing,1999; Friedman and Levinsohn, 2001; Baldacci et. al., 2002). Therefore, the interesting question to ask here is whether the long-term effects are created by interventionist policies. For example, Halac and Schmukler (2003, 2004) argue that financial transfers from nonparticipants to participants during crises are large and expected to increase income inequality.

As was exemplified by the recent crisis authorities may intervene in the markets after unfavorable shocks, but they might do so without having fully understood the long-term consequences. The choice regarding the issue of short or long term effects of policies obviously becomes a question of political economy and is not in the scope of this paper; nevertheless, we raise attention and a warning to the fact that the effects should be clearly understood when it comes to a trade off between short and long term.

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References

[1] Acemoglu, Daron. 2001. "Credit Market Imperfections and Persistent Unemployment." European Economic Review 45:665-679.

[2] Acemoglu, Daron and Zilibotti, Fabrizio. 1997. "Was Prometheus Unbound by Chance? Risk, Diversification and Growth." The Journal of Political Economy, Vol. 105, No. 4, pp. 709-751.

[3] Aghion, Philippe and Bolton, Patrick. 1997. "A Theory of Trickle-Down Growth and Development." The Review of Economic Studies 64 (April):151-172.

[4] Akyol, Ahmet and Athreya, Kartik. 2003. "Risky Higher Education and Subsidies." Federal Reserve Bank of Richmond Working Paper 03-02.

[5] Azariadis, Costas. 2001. "The Theory of Poverty Traps: What Have We Learned?" The Workshop on Poverty Traps, Santa Fe Institute, July 20-22, 2001.

[6] Baldacci, Emanuele., de Mello, Luiz and Inchauste, Gabriela. 2002. "Financial Crises, Poverty and Income Distribution." IMF Working Paper Series, No. WP/02/4.

[7] Banerjee, Abhijit V. and Newman, Andrew F. 1993. "Occupational Choice and the Process of Development." The Journal of Political Economy 101 (April):274-298.

[8] Bernanke, Ben and Gertler, Mark. 1990. "Financial Fragility and Economic Performance." The Quarterly Journal of Economics, Vol. 105, No. 1, pp. 87-114.

[9] Besanko, David and Thakor, Anjan V. 1987. "Competitive Equilibrium in the Credit Market under Asymmetric Information." The Journal of Economic Theory 42 (1):167-182.

[10] Bhattacharya, Sudipto and Thakor, Anjan V. 1993. "Contemporary Banking Theory." Journal of Financial Intermediation 3 (October):2-50.

[11] Brescia, Ray. 2010. "The Cost of Inequality: Social Distance, Predatory Conduct and the Financial Crisis." NYU Annual Survey of American Law, Vol. 66.

[12] Chari, V. V., Golosov, Mikhail and Tsyvinski, Aleh. 2005. "Business Start-ups, The Lock-in Effect, and Capital Gains Taxation." UCLA Department of Economics Working Paper.

[13] Clemens, Christiane and Heinemann, Maik. 2010. "On Entrepreneurial Risk-Taking and the Macroeconomic Effects of Financial Constraints." Journal of Economic Dynamics and Control, Vol. 34, Issue 9, pp. 1610-1626.

[14] De Meza, David and Webb, David. 1987. "Too Much Investment: A Problem of Asymmetric Information." The Quarterly Journal of Economics 102 (May):281-292.

[15] De Nardi, Mariacristina. 2004. "Wealth Inequality and Intergenerational Links." The Review of Economic Studies, Vol. 71, pp. 743-768.

[16] Diamond, Douglas W. 1984. "Financial Intermediation and Delegated Monitoring." The Review of Economic Studies 51 (July):393-414.

[17] Diamond, Douglas W. 1996. "Financial Intermediation as Delegated Monitoring: A Simple Example." Federal Reserve Bank of Richmond Economic Quarterly 82 (Summer):51-66.

[18] Diamond, Douglas W. and Dybvig, Philip H. 1983. "Bank Runs, Deposit Insurance and

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Liquidity." The Journal of Political Economy 91 (June):401-419.

[19] Diamond, Peter A. 1965. "National Debt in a Neoclassical Growth Model." The American Economic Review 55 (December): 1125-50.

[20] Freixas, Xavier and Rochet, Jean-Charles. 2008. "Microeconomics of Banking, 2nd Edition." The MIT Press, Cambridge, MA.

[21] Friedman, Jed and Levinsohn, James. 2001. "The Distributional Impacts of Indonesia's Financial Crisis on Household Welfare: A "Rapid Response" Methodology." NBER Working Paper Series, No. 8564.

[22] Galbraith, James K. and Jiaqing, Lu. 1999. "Inequality and Financial Crises: Some Early Findings." UTIP Working Papers, No. 9.

[23] Galor, Oded and Zeira, Joseph. 1993. "Income Distribution and Macroeconomics." The Review of Economic Studies 60 (January):35-52.

[24] Ghatak, Maitreesh., Morelli, Massimo and Sjostrom, Tomas. 2001. "Occupational Choice and Dynamic Incentives." Review of Economic Studies, Vol. 68, No. 4, pp. 781-810.

[25] Habib, Bilal., Narayan, Ambar., Olivieri, Sergio and Sanchez, Carolina. 2010. "The Impact of Financial Crisis on Poverty and Income Distribution: Insights from Simulations from Selected Countries." The World Bank Poverty Reduction and Economic Management Network (PREM) The Economic Premise Note Series, No. 7.

[26] Halac, Marina and Schmukler, Sergio L. 2003. "Distributional Effects of Crises: The Role of Financial Transfers." World Bank Working Paper Series, No. WPS3173.

[27] Halac, Marina and Schmukler, Sergio L. 2004. "Distributional Effects of Crises: The Financial Channel." Economia, Vol. 5, No. 1.

[28] Lucas, Robert E. Jr. 1978. "On the Size Distribution of Business Firms." The Bell Journal of Economics 9 (Autumn):508-523.

[29] Martin, Alberto and Taddei, Filippo. 2010. "International Capital Flows and Credit Market Imperfections: A Tale of Two Frictions." Mimeo

[30] Naude, Wim and MacGee, James C. 2009. "Wealth Distribution, the Financial Crisis and Entrepreneurship." WIDER Angle Newsletter, March.

[31] Perotti, Roberto. 1993. "Political Equilibrium, Income Distribution and Growth." The Review of Economic Studies 60 (October):755-776.

[32] Piketty, Thomas. 1997. "The Dynamics of the Wealth Distribution and the Interest Rate with Credit Rationing." Review of Economic Studies 64:173-189.

[33] Quadrini, Vincenzo. 2000. "Entrepreneurship, Saving and Social Mobility." The Review of Economic Studies, Vol. 3, pp. 1-40.

[34] Rothschild, Michael and Stiglitz, Joseph E. 1970. "Increasing Risk:I, A Definition." Journal of Economic Theory 2 (September):225-43.

[35] Rothschild, Michael and Stiglitz, Joseph E. 1976. "Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information." The Quarterly Journal of Economics 90 (November):629-649.

[36] Samuelson, Paul A. 1958. "An Exact Consumption-Loan Model of Interest with or without the Social Contrivance of Money." Journal of Political Economy 66 (December): 467-82.

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[37] Stiglitz, Joseph E. 1969. "Distribution of Income and Wealth Among Individuals." Econometrica 37 (July):382-397.

[38] Stiglitz, Joseph E. and Weiss, Andrew. 1981. "Credit Rationing in Markets with Imperfect Information." The American Economic Review 71 (June):393-410.

[39] Townsend, Robert M. 1979. "Optimal Contracts and Competitive Markets with Costly State Verification." Journal of Economic Theory 21(October):265-293.

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