The Church's Ban on Consanguineous Marriages, Extended Kin-groups and Democracy

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Abstract – *This paper highlights the role of extended kin-groups for the functioning of modern societies: in countries with strong extended families, characterized by a high level of cousin marriages, the rule of law is weak and they are more likely autocratic. To assess causality, I use a historic event as a source of exogenous variation. In the early medieval ages the Church started to prohibit kin-marriages. Using the variation in the duration and extent of the Eastern and Western Churches' ban on consanguineous marriages as an instrument, reveals a large effect of the percentage of cousin marriage on an index of democracy. An additional novel instrument, kin-terms, strengthens this point: the effects are very similar and do not rest on the European experience alone. Within country evidence based on individual survey responses supports these results. These findings point to a causal effect of marriage patterns on the proper functioning of formal institutions and democracy. The Church's marriage rules most likely impacted social closure, gave rise to an individualist western culture and paved the way for well-functioning formal institutions and the unique economic success of Europe.*

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1. Introduction

The role of the family as one of the most fundamental institution for human society is unquestionable. The family has traditionally been seen as individually beneficial. It provides emotional and material security. However, strong kinship ties can have a perverse negative effect for the society as a whole. It can foster an in-group mentality and prevent a generalized morality to develop that goes beyond the confines of the family. As a key consequence, nepotism and a focus on the narrow self-interest of the family may undermine the essence of democracy – playing by the rules set by the whole society. Family structures vary considerably between countries. In many countries the extended family, strengthened by kin-marriages, plays an important role. In parts of the world, cousin marriages account for between 20 and 50 percent of all marriages (Bittles and Black, 2010). The social closure implied by kin-marriage creates much tighter family networks compared to the less fractionalized societies where the nuclear family dominates. In this paper I demonstrate that extended kin-groups (as proxied by cousin marriage) are most likely at the core of the large developmental differences in institutional quality and democracy across countries: excessive reliance, loyalty, nepotism, conflict and other contingencies of extended families impede the proper functioning of formal institutions. This study suggests that a specific historic event – the Church ban on consanguineous marriage (marriage of the same blood) – constituted a critical juncture leading Europe to a special path in its economic and institutional development. Western democracy did not start with the political thoughts of Hobbes and Locke, Montesquieu and Rousseau, but it is in continuation of societal changes that already started in the early medieval ages.

The idea that the extended kin-networks play a decisive role in institutional and economic outcomes is very old. The early Christian theologian St. Augustine (354 - 430) propagated a ban on consanguineous marriages by pointing out that it enlarges the range of social relations and "should thereby bind social life more effectively by involving a greater number of people in them" (Augustine, 1998, p. 665). For Weber (1958), the disappearance of the extended family in Europe is one of the central preconditions for the development of public law and the political state (see also MacFarlane, 1992; Goody, 1990 on Weber's view). Todd (1987) argues that family systems can explain the acceptance and diffusion of societal changes like Protestantism or political ideologies like communism, while Alesina and Giuliano (2014) argue that the extreme reliance on the family prevents the development of institutions and public organizations. Greif (2005) traces the origins of western corporations to the decline of kinship groups. Greif sees the reason for this decline in the Church's marriage laws and practices that undermined kinship groups. He views corporations and the nuclear family as a distinguishing feature of the European institutional foundations of markets, polities and knowledge.

This paper builds on the idea that extended kin-groups are detrimental for institutional development. Best to my knowledge it is the first paper that provides causal evidence on the effect of marriage patterns on the functioning of democracies and formal institutions. Apart

from being of historical interest, it directly relates to the current debate on the role of culture for economic outcomes and highlights the importance of societies' network structures for morality and the proper functioning of formal institutions. This is in contrast to modernization theory which argues that, as societies become wealthier and more educated they also become more democratic (Lipset, 1959). Most likely kin-network structures, which are rooted in a country's long term history, are a decisive developmental factor. In line with Acemoglu et al. (2008, 2005)'s idea of critical junctures (that is, that historical factors have shaped the divergent political and economic paths of various societies), I argue that the Church's ban on consanguineous marriages constituted such a juncture leading Europe on its special developmental path.

To assess causality, I follow three approaches. Firstly, I make use of a quasi-natural historical experiment – the duration of the Church's ban on consanguineous marriages. Secondly, I use a linguistic rule – cousin terms – in instrumental variables (IV) estimation and thirdly I exploit within country variation of the duration of the Churches' ban in country fixed effects regression.

Starting in the early medieval ages the Western Church imposed several marriage regulations that weakened the extended family: most prominently the banning of consanguineous marriages. This ban was very comprehensive – the Catholic Church at times prohibited marriages up to seventh degree of relatedness (that is, marriage between two people sharing one of their 64 great-great-great-great-grandfather). The Eastern Church also banned cousin marriage but never to the same extent.

I use the duration of the Church's ban and the different regulations in the Eastern and Western Church as IVs for marriage patterns. Crucially for causal identification, the ban was imposed exogenously top-down on the inhabitants. Letters to Popes give evidence that there was initial opposition to these regulations. Moreover, the (often random) outcome of wars shifted the reign of rulers (and with it the "state religion"). Methodologically this approach – using a quasi-natural experiment – is similar to Acemoglu et al. (2011), who use the occupation of some parts of Germany by Napoleon (following the French Revolution) as a source of exogenous variation to study the effect of institutions on economic prosperity.

Reduced-form country fixed-effects regressions (exploiting the panel structure of historic data) reveals that the Church's rule has had an early impact on institutional and economic conditions. A longer duration of the ban is positively associated with population density and state formation (already up to the year 1500). As expected, this relation is stronger for the Western Church with its more encompassing ban. Using the duration of the Eastern and Western Church's ban as IVs in two stage least squares regression reveals a strong effect of the percentage of cousin marriage on the quality of present-day formal institutions and the level of democracy.

The drawback of this IV is that the Church's ban coincides with the introduction of Christianity in many countries. The concern that other innovations the Church introduced drive the results is mitigated by the different extend of the ban in the Eastern and Western Church (both in the Roman tradition) as a source of variation independent from the introduction of Christianity. Further, the results also hold when controlling for today's fraction of Christians in a country. Thus, it is unlikely that there is estimation bias due to a factor inherent in the Christian belief that simultaneously affects marriage patterns and institutional quality. To address this concern I demonstrate that the (causal) identification is robust to an alternative identification strategy (that does not rest on the European experience alone). I employ a second instrument: cousin-terms.

In Anthropological research it has been long established that kin-terms reflect family structures (Morgan, 1870). This second IV captures whether the terms for cousin are differentiated (e.g. between the mother's side and the father's side). Differentiated cousin terms are strongly associated with a preference for cousin marriage. Using a linguistic rule as an IV follows Licht et al. (2007) and Tabellini (2008). Language only changes very slowly over time. As such, it reflects distant (and only very decisive) factors that shaped marriage patterns. More immediate conditions (like political uncertainty, war, or famines) that may impact on kin-network structures are not reflected in kinship terms. This IV therefore rules out the influence of more recent factors. This approach likewise reveals a strong and robust effect of marriage patterns on the proper functioning of institutions. The relationship also holds and is quantitatively very similar when countries in which a sizable fraction of ancestors experienced the Church's kin-marriage ban are excluded. This demonstrates that the relationship between family systems and institutional outcomes holds more general and is not only driven by European countries or countries with a large population of European descent.

Lastly, I turn to within-country analysis. Other than the cross-country regression this allows to capture unobserved country fixed effects. Italy has long been used as an example where there are large differences in institutional quality within the country. I demonstrate that differences in kin-networks is a likely explanation. Data on cousin marriage rates at the provincial level in Italy, reveals a strong and highly significant positive association with criminal activity by the mafia. Both are higher in the South, where the duration of the Western Church's kin-marriage ban was shorter. To further investigate the impact of family systems on institutional outcomes within countries, I rely on survey responses based on the World Value Survey (WVS) and the European Values Study (EVS) – in addition to country fixed effects this approach allows to control for individual factors like education and religious affiliation. Individuals holding a conception of marriage that emphasizes societal pressures (e.g. same religious affiliation or socio-economic status as opposed to love and affection) are more likely to prefer an undemocratic government, and score higher on limited morality (as opposed to a more generalized morality). IV estimations exploiting within country variation in the duration of the

Western Church's ban likewise points to a causal effect of societal marriage pressures on attitudes to democracy and generalized morality.

The paper is structured as follows. Firstly, I give a brief literature overview on the relation between kin-marriage and its effect on institutional quality (section 2). Section 3 demonstrates a robust association between cousin-marriage and democracy in OLS regressions controlling for a wide range of covariates, which have been shown to be important determinants for the proper functioning of institutions. In section 4 I describe the historical context of the Church's ban on consanguineous marriages and present the results of estimation with the Church's kin-marriage ban as IVs. Section 5 presents the estimations with kin-terms as IV. Section 6 reports the within-country results. Section 7 concludes.

2. Literature review

In economics Greif (2005) and Greif and Tabellini (2015) have made the point that strong kin-groups impact economic development. Greif (2005) argues that the Church's marriage regulations caused the nuclear family to dominate Europe by the late medieval period, while extended kinship groups lost power. This allowed the establishment and growth of corporations in Europe, which substituted for kinship groups and provided a safety net. Greif and Tabellini (2015) make a similar point by comparing China and Europe: in China the clan was the fundamental institution providing safety nets and public goods, while in Europe where the nuclear family prevailed individuals organized in corporations. They show how this let to differential social and institutional developments.

However, there is yet not much empirical research investigating the effect of family structures on cross-country differences in institutional and economic outcomes. Buonanno and Vanin (2015) investigate the effect of social closure on crime and tax compliance in Italian municipalities. Their measure of closure is based on the diversity of surnames, which reflects the history of migration and inbreeding. They find that while communities with a history of social closure have lower crime rates, they also have higher tax evasion rates. This is consistent with the idea that social closure leads to more control in local interactions, but reduces cooperation on a larger scale. Woodley and Bell (2012) show that cousin marriage is a predictor of democracy. Other than in this paper they do not provide causal estimates or link it to historical factors.

Culture and its associated norms and values have received increasing attention to explain societal differences in the quality of institution and economic prosperity (see e.g. Guiso et al., 2006 and Knack and Keefer, 1997). Closely related are Alesina and Giuliano (2014, 2011, 2010). They focus on family ties (as measured by attitudes towards the nuclear family) and demonstrate how this affects a wide array of economic outcomes and attitudes. Strong family ties are correlated with larger amount of home production, lower labor force participation

(Alesina and Giuliano, 2010) and a lower level of generalized trust and political participation (Alesina and Giuliano, 2011). Alesina and Giuliano (2014) find that countries with stronger family ties have a lower quality of institutions and GDP per capita.

An emerging field studies deep historic determinants of economic and institutional development (for an overview see Spolaore and Wacziarg, 2013). The idea is that deep historic factors and present day outcomes are linked by the slow changing nature of culture defined as those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation (see Guiso et al., 2006 for this definition of culture and the theoretical work by Bisin and Verdier, 2001 on cultural transmission). Licht et al. (2007), Tabellini (2008) and Gorodnichenko and Roland, (2015, 2013) emphasize the role of cultural values (which stress loyalty to a cohesive group) for the functioning of institutions.[1] To identify causality, the studies use 'deep variables' like linguistic rules and genetic distance as IVs, which are not influenced by recent events and therefore rule out reverse causality and (contemporary) omitted variables.

Licht et al. (2007) present evidence that the cultural dimension of autonomy vs. embeddedness (in a group) has a causal effect on the rule of law and governance, such that the more embedded a person is in their group, the weaker is the rule of law. To identify a causal effect, they make use of a linguistic rule regarding pronoun dropping. Their argument is that cultures which emphasize the individual do not allow pronoun dropping. Since language evolves slowly it thus should not be influenced by more recent (omitted) factors. Similarly, Tabellini (2008) investigates the effect of generalized morality (as opposed to a morality limited to the in-group) on institutional quality using the same IV. The results suggest that limited morality has a detrimental impact on bureaucratic quality.

In a series of papers, Gorodnichenko and Roland (2015, 2013, 2011b) demonstrate that Hofstede's measure for individualism (preference for loosely knit networks as opposed to a tightly knit framework in society) has a positive impact on long-term growth, institutions and democratization. They use genetic distance (based on neutral markers so that there cannot be a direct genetic impact) as their main IV to provide causal evidence. The idea is that migratory patterns reflect both genetic and cultural differences; to the extent that culture is mainly transmitted from parents to children so are genes. Thus genetic distance can be seen as marker for cultural transmission.

While these papers highlight the slow pace of cultural change, they are not able to reveal, however, what events gave rise to the observed differences in the first place. A wide array of distant historical events (e.g. wars, agricultural techniques, religion, etc.), or genetic, and

[1] Among values those which measure "loyalty to one's extended in-group" may be the most important ones for institutional outcomes. Gorodnichenko and Roland (2011b) show that out of all of Hofstede's cultural dimensions individualism (closely related to loyalty to one's in-group) matters most for long-run economic growth.

geographical factors can give rise to differences in current cultural values.[2] This paper highlights a specific event in the more distant past: the Church's introduction of marriage policies that weakened the extended family and thereby changed kin network structures. As such, it relates to the expanding literature that puts emphasis on deep historic factors shaping economic outcomes.

However, this study goes beyond values and highlights kin-network structures. Network structures are a key element to understand the cross-societal differences in development (see also Collier, 2016, emphasizing network structure to understand the cultural foundations of economic failure).[3] Network structures are linked to values: people in closely-knit family networks interact less often with outsiders, learn less about others' behavior and therefore may trust others less. This argument – that intense group ties prevent trust from developing beyond the confines of the family – is made by Yamagishi et al. (1998), Fukuyama (1995), and Alesina and Giuliano (2013) among others.[4] However, kin-networks also have a direct effect on economic incentives. Supporting one's extended family benefits the prospective spouses of one's own children and therefore indirectly one's future grandchildren. The biological implication of kin-marriage is an increased coefficient of relatedness between kin. As a consequence, heuristics favoring kin (ultimately shaped by kin-selection, Hamilton, 1964) may be more often invoked.[5]

Further, in the absence of some other strong supra-level institutions (like a nation-state with functioning rule of law), the extended family provides protection and insurance while demanding loyalty. That is, the network structure implied by the family system creates constraints for the people therein. These pressures may be quite strong given the easier monitoring in closely-knit networks and the potentially extreme cost of ostracism in a society with no well-functioning institutions providing protection. Thus, an individual has to take into account the demands of the extended family, which may manifest itself by having to hire relatives (leading to nepotism), accepting bribes, or other activity which benefits the family at the expense of the larger society. As such, individuals find themselves stuck in an equilibrium where it is beneficial to support the extended family while at the same time hindering more efficient large-scale institutions that provide insurance and protection to develop.

[2] Ashraf and Galor (2013) attribute differences in economic development to human genetic diversity. They find a hump-shaped effect and argue that this reflects a trade-off: low diversity leads to less conflict but also less innovation while high diversity leads to more conflict and more innovation.

[3] Biological research likewise highlights the importance of network structures and information flows for the emergence of human cooperation (among non-kin). See e.g. (Rand et al., 2014, 2011). Analytically, the focus on networks (and the constraints they create) has the appealing feature that it allows to investigate behaviour in a optimization framework rather than evoking cultural in a more unspecific way.

[4] See also Talhelm et al. (2014). They demonstrate how differences in agriculture (one requiring more functional interdependence among individuals) leads to psychological differences.

[5] In the absence of in-breeding the genetic relatedness between cousins is 1/16. The relatedness coefficient increases with inbreeding – particularly if there is a long prior history of in-breeding. However, it is not clear how and to what extent this increase in relatedness translates into behavior via social heuristics that are shaped by evolution. It is likely to be relatively less important compared to sociological factors given the increase in the coefficient of relatedness is rather moderate.

A society fractionalized along the lines of extended families is also likely more conflict prone — an argument akin to the literature on ethnical fractionalization (see Alesina et al., 2003; Alesina and Ferrara, 2005; Alesina and Zhuravskaya, 2008; Easterly and Levine, 1997), though family is a smaller unity than ethnicity. Further, as Hillman et al. (2015) point out group identity is inconsistent with democracy. There is no point in voting according to group identity (as opposed to voting on policies, or personal preferences) as the results depend on the strength of the group (e.g. the linage or ethnicity) and therefore leads to a repetition of the same electoral outcome. Similarly, there is no point in being an opposition that (loyal to the constitution) awaits a turn in government when, because of group voting, such a turn will never come.

For all of these reasons, closely-knit families may reinforce behavior that is in line with a limited morality and prevents large-scale cooperation and coordination essential for democracy. Thus, like Bowles (2011) argues this suggest that more market integrated, liberal societies do not lead to a decline in personal trust (beyond the in-group), but rather are characterized by a more general morality. Evidence from cross-societal behavioral studies find evidence consistent with this argument. People from societies that are Western, Educated, Industrialized, Rich, and Democratic (WEIRD) in many instances are behaviorally distinct from most populations around the world (Henrich et al., 2010). Herrmann et al. (2008) conducted a public goods game with and without punishment among anonymous student participants. Consistent with the idea that interactions in collectivistic societies are confined to the in-group, they observed more anti-social punishment (the punishment of those that cooperated more than the punisher) in collectivistic societies. Similarly, Gächter and Schulz (2016) find that student samples from collectivistic societies, are less honest. Relatedly, Henrich et al. (2001) finds evidence that market integration – presumably a consequence of declining extended families and a proxy for the frequency of interaction with unrelated others – leads to more cooperation. Finally, Barr et al. (2014) present evidence that cooperation in experimental games is associated with political participation.

Taken together, as Weber argues, the dissolution of strong extended kinship ties is likely an essential precondition for the proper functioning of formal institutions in modern large-scale societies. Prohibition of kin-marriage has a direct effect on financial incentives (and biological heuristics shaped by kin-selection): biological relatedness among the extended family decreases and incentives to indirectly benefit one's own offspring by benefitting extended nieces and nephews also do not exist anymore. More importantly, the increased interaction with individuals outside the extended family may change values towards a more general morality, while losing the protection of (and loyalty demands by) the extended family may create a demand for a rule of law governing non-lineage-related interactions.[6] This may have led to a transition from a code of honor to a code of law (Pinker, 2012).

[6] E.g. the Salian Franks legal code (around 500) rendered relatives mutually liable for debts, legal penalties, and legal compensation. This was no longer the case in the 10th century (see Greif and Tabellini, 2015).

3. Kin-Marriage and democracy: OLS Estimate

Figure 1 reveals a strong negative association between cousin marriage and democracy (cousin marriage is based on Bittles, 2001, and democracy on the Polity IV data, see appendix C for details). Spearman's rho is -0.73 and highly significant. The linear fit reveals that a 10 percentage point increase in cousin marriages is associated with an about 3 points lower democracy score.

The OLS regression in Table 1 corroborates this finding when a long list of covariates is included that previous research has identified as important determinants for democracy. Modernization theory (see Lipset, 1959) has emphasized the role of education and economic growth in promoting political development. Glaeser et al. (2007) show that education and democracy are highly correlated. They make the point that schooling teaches people to interact with others and increases the benefits of civic participation. As such, they emphasize a similar mechanism (interaction with others fosters civic engagement and thus supports democracy), but attribute it to schooling. Column (2) controls for education (the UN education index for the year 2005), and in column (3) GDP per capita is added as another proxy for "modernization".

Countries' legal origins are included in column (4). La Porta et al. (2008) and La Porta et al. (1999) stress its importance for countries' formal institutions. A further control in column (4) is ethnolinguistic fractionalization. La Porta et al. (1999) and Alesina et al. (2003) demonstrate a negative effect of ethnic fractionalization on the quality of government. The mechanisms underlying this relation are likely to be similar to the ones outlined for family systems: both ethnic fractionalization and fractionalization along extended families (even within an ethnicity) may decrease public goods provision and trust and foster tensions and conflict. Thus, even an ethnically homogeneous country may experience conflict due to strong kinship groups.

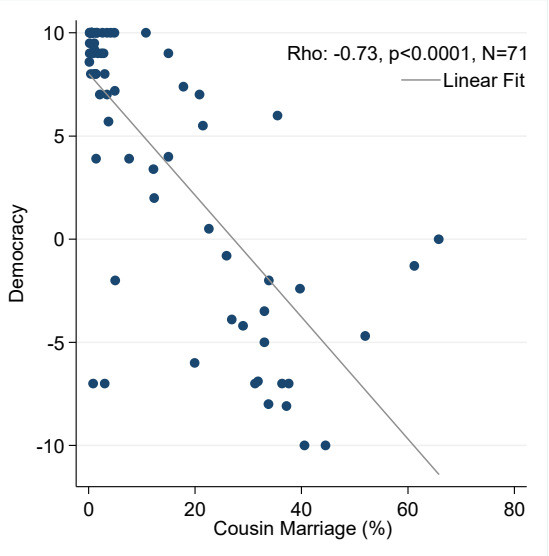


Figure 1: Cousin marriages (first and second degree) and democracy

	(1) Democracy OLS	(2) Democracy OLS	(3) Democracy OLS	(4) Democracy OLS	(5) Democracy OLS	(6) Democracy OLS	(7) Democracy OLS
%-Cousin Marriage	-0.295***	-0.281***	-0.295***	-0.295***	-0.287***	-0.209***	-0.204**
	(0.047)	(0.052)	(0.049)	(0.052)	(0.057)	(0.069)	(0.089)
Education 2005		2.353					2.571
		(4.125)					(7.085)
GDP per capita 2000			-0.002				-0.161*
			(0.059)				(0.089)
UK legal origin				2.306			4.704*
				(2.264)			(2.738)
French legal origin				1.827			3.194
				(2.009)			(2.301)
Ethnolinguistic fractionalization				-2.541			-0.921
				(2.626)			(2.885)
Neolithic transformation					-0.000		-0.000
					(0.000)		(0.001)
Absolute latitude					0.904		0.520
					(0.649)		(0.816)
Continent Dummies						Yes	Yes
Constant	8.025***	6.330**	8.051***	7.399***	5.673***	9.890***	8.636
	(0.688)	(3.106)	(1.208)	(1.698)	(1.903)	(0.146)	(5.346)
N	68	68	68	68	68	68	68
F-stat	39.87	18.77	19.81	10.03	15.66	33.99	12.51

Table 1: Cousin marriage rates and democracy. Dependent variable is an index of democracy based on the Polity IV data set (varying from -10 to 10). Explanatory variable is the percentage of cousin marriage (based on Bittles, 2001). Covariates include the UN index of education in 2005, GDP per capita in 2000 (taken from Ashraf and Galor, 2013), UK and French legal origin (according to La Porta et al. 2008), the timing of the Neolithic transformation (Putterman, 2008), absolute latitude (taken from Acemoglu et al., 2001), and continent dummy variables (excluded is Europe and Oceania since there is only one observation, Australia). Robust standard errors are reported in parenthesis. *p < 0.10, **p < 0.05, ***p < 0.01.

Column (5) includes controls for historically-distant events (Neolithic transformation) and geography (latitude). Diamond (1997) emphasizes that initial geographical and biogeographical conditions gave rise to the adoption of agricultural practices (the timing of the Neolithic transformation could thus be seen as a proxy for geographical and biogeographical starting conditions). In line with this reasoning, Putterman, (2008) finds that the effects of the Neolithic revolution are still impacting incomes across the world today. In column (6) dummy variables for the continents are added. In column (7) all coefficients are used simultaneously. This may be problematic due to multicollinearity (particularly having the highly correlated GDP, cousin-marriage and education in the regression simultaneously since like I argue, Economic development (and with it education) may be ultimately driven by marriage patterns). The possibility of multicolinearity is somehow mitigated as in Middle Eastern countries, while there are high cousin marriage rates, a non-negligible fraction of their GDP stems from natural resources. Nevertheless, some caution applies when interpreting these estimates.

The regression results in Table 1 reveal a highly-significant and quantitatively-large association between the percentages of cousin marriages and democracy: a 10 percentage point higher cousin marriage rate is associated with an approximately 3 points lower sore on the democracy index. This association holds when controlling for a wide range of covariates (column 2 to 6). Interestingly no other covariates exhibit coefficients that are significantly different from zero in column 1 to 6. This is also the case for education and GDP per capita, which capture 'modernization'. This suggest that cousin marriage is a very important factor for democracy. Similarly, the R^2 does not increase much when the other covariates are added with the exception

of adding continent dummies (column 6 and 7). Using continent dummies, the coefficient of '%-Cousin Marriage' decreases but is still highly significant (column 6) and significant when all covariates are used simultaneously (column 7). This decrease is not surprising given that the Church's ban on consanguineous marriages has its origins in Europe.

As a robustness check I rely on a second indicator from a different source. It is a dummy variable capturing whether cousin marriage is predominantly preferred in a given country. It is based on Rijpma and Carmichael (2013) and work by Jutta Bolt. Albeit a courser measure it increases the sample to 132 countries (see figure B.3 in the appendix for the world distribution).

Table A2, column (1) and (2) in appendix A likewise reveals a significant association between 'cousin marriage preferred' and democracy controlling for many covariates. Alternative measures for the proper functioning of institutions likewise paint a very similar picture (Table A1 and A3 in the appendix A). Intriguingly, the results hold when using the indicator 'Constraints on the executive between 1901 and 1910 (Table A3, column 5 and 6). This is further evidence that deep, historic factors shape institutional outcomes.

Religion - Can some inherent property of the Christian belief explain the findings? Disentangling the effect of Christianity from marriage patterns is complicated by the fact that in most countries with a sizable proportion of Christians cousin-marriage is avoided due to the history of the Church kin-marriage ban. In the within country analysis of section 6 I employ individual responses of the World and the European value surveys and show that the association between marriage and attitudes to democracy is robust to the inclusion of religious affiliation at the individual level. Nevertheless, even in cross-section data there is variation due to Atheists and African countries with a sizable Christian population but no medieval history of the ban on consanguineous marriages. Table 2 reports OLS regressions with the share of Christians included. Further controls are dummy variables for the different Christian denominations (the baseline is Catholic).[7]

Column (2) to (4) contains controls for further major religions. Huntington (1991) and Fish (2002) have suggested that Islam is detrimental to democracy. Indeed, Fish (2002) finds that the proportion of Muslims is negatively correlated with democracy. However, it may not be Islam, but rather the underlying marriage patterns in a society that is detrimental to the proper functioning of institutions. Countries North Africa and the Middle East show a high level of cousin marriage. Further, parallel-cousin marriage (father's brother's daughter) is preferred (Korotayev, 2000). In fact, often times a man even has the right to marry his *bint 'amm* (father's

[7] Weber (1958) has emphasized the role of a Protestant ethic in the development of formal institutions, democracy and economic prosperity. The Church's kin-marriage offers an alternative or complementary interpretation: often the Reformation successfully took hold in areas that had a long history of the cousin marriage ban. As such, these areas may have exhibited higher economic prosperity, not (only) because of a particular Protestant work ethic but also due to a longer history of marrying outside the family, which fostered individualistic values and the development of well-functioning institutions (see also Todd, 1987, p. 59-60, making the point that family systems were decisive for mass literacy and diffusion and resistance to Protestantism).

	(1) Democracy OLS	(2) Democracy OLS	(3) Democracy OLS	(4) Democracy OLS
%-Cousin Marriage	-0.166**		-0.118*	-0.114***
	(0.072)		(0.066)	(0.039)
Parallel				-5.733**
				(2.591)
Fraction Christian	6.463**	3.767	2.292	1.493
	(2.676)	(5.452)	(5.518)	(8.060)
Fraction Protestant	3.887**	4.774*	4.748*	4.345*
	(1.668)	(2.617)	(2.745)	(2.597)
Fraction Orthodox	-0.088	2.887	9.107	15.760
	(23.506)	(15.682)	(20.773)	(12.619)
Fraction Other Christian	2.515	3.098	2.225	2.102
	(2.381)	(3.493)	(3.572)	(3.592)
Fraction Muslims		-10.455*	-7.957	-3.982
		(5.891)	(5.812)	(9.409)
Fraction Hindu		-10.413	-13.204	-13.675
		(10.134)	(10.451)	(13.006)
Fraction Buddhist		4.796	4.157	2.252
		(5.706)	(5.658)	(8.014)
Fraction No religion		2.422	2.202	0.737
		(7.174)	(6.635)	(9.637)
Constant	2.567	5.374	7.157	7.830
	(2.613)	(5.352)	(5.472)	(8.090)
N	68	68	68	68
R^2	28.22	17.87	17.51	31.67

Table 2: OLS regression of '%-Cousin Marriage' on democracy controlling for Religion. Data on religion is taken from Barro and McCleary (2003) Robust standard errors are in parenthesis. *p < 0.10, **p < 0.05, ***p < 0.01.

brother's daughter). However, parallel cousin marriage is not rooted in Islam. Mitterauer (2015) among others has suggested that the (rough and conflict lading) environment of camel herding gives rise to parallel cousin marriage; the geographic extension of parallel cousin marriage coincides with the range of camels' habitat. Outside the camel's habitat – e.g. in the predominantly Islamic countries in South-East Asian, as well as in countries like Turkey, Uzbekistan and Kyrgyzstan - parallel cousin marriage is not preferred.

In the patrilineal societies of North Africa and the Middle East this type of marriage leads to lineage endogamy – the prospective spouse is from one's own decent group. This is in contrast to cross-cousin marriage where the prospective partner is from a different lineage. As a consequence, extended kin-groups are stronger and the society is even more fractionalized. Regressions that ignore this underlying family structure may find a negative effect of Islam on democracy because they suffer from an omitted variable bias.

From table 2, column (1) it is apparent that the association between the percentage of cousin marriage and democracy is robust when controlling for the fraction of Christians. Due to the high overlap between the fractions of Christians and marriage patterns, it is not surprising that the coefficients for cousin marriages is lower than the ones of table 1. Still, a 10 percentage point increase in cousin marriage is associated with a 1.7 units lower democracy score. In line with Weber (1958)'s argument about Protestant ethics, the proportion of Protestants exhibits a significant larger effect on democracy than the other Christian denominations. However, this could also be driven by a longer duration of the ban in these areas.

Along the lines of Huntington (1991), column (2) reveals a weakly significant (but large) negative coefficient of the share of Muslims, when the regression does not control for marriage patterns. Controlling for the percentage of cousin marriage (column 3) decreases the coefficient for the fraction of Muslims. Controlling for whether parallel cousin marriage is preferred, leads to a further substantive decline in the coefficient for the fraction of Muslims. The percentage of cousin marriage exhibits a weakly significant coefficient (column 3) and highly significant coefficient (column 4) when controlling for parallel cousin marriage. Parallel cousin marriage is likewise significant and quantitatively large. This is evidence that it is not the Islamic religion that impacts democracy negatively. Rather it may be the preference for parallel-cousin marriage in Arabic societies that impacts the norms, values and proper functioning of democracy.[8]

4. The Church's ban on consanguineous marriages and institutional development

The OLS results show a robust association between cousin marriages and democracy controlling for a wide range of covariates. However, unobserved omitted variables and reverse causality may bias these estimates. In this section I make use of the exogenous nature of the Church's ban on consanguineous marriages to assess causality.

4.1 Historical background

Starting in the early medieval ages, the Church imposed several marriage practices that weakened the extended family. For example, the Church insisted that the groom and the bride consented freely; only then would the Church acknowledge a marriage. It also discouraged polygamy, divorce, adoption and remarriage. Most importantly the Church prohibited consanguineous marriages (marriage of the same blood). This ban also encompassed affinal relatedness, people related to one's sexual partners, and baptismal sponsors. The ban on consanguinity gained momentum starting in the 8th century. Pope Zacharias stated in 743 that Christians are not allowed to marry if they were in any way related to each other. The incest legislation and enforcement tightened and probably in the middle of the 9th century the ban on consanguinity extended to the 7th degree (or to anyone where some relationship was known) in all of the Western Church's sphere.[9] In 1215 pope Innocent restricted consanguinity to the 4th

[8] Norms related to gender discrimination and veiling may also be closely related to marriage patterns. In most societies parallel-cousin marriage falls under incest taboos. Brothers (often residing at the same loci in patrilineal societies) may have sexual relations with the wife of the other, making apparent parallel-cousins half-siblings. An incest taboo on parallel-cousin marriage thus rules out the possibility that apparent parallel-cousins that share a father marry (see Smith, 1978) . In societies that prefer parallel cousin marriage shielding women from interaction with men (other than the husband) reduces this possibility and may thus lead to norms like veiling. For cross-cousin the possibility to share a father (absent full sibling incest) is much less likely.

[9] It is not clear when this increase occurred. Pope Gregory III wrote in 732 that marriage was forbidden to the 7th degree. However, there was disagreement in the Western Church as to the modes of counting: Both the Germanic or the Roman one existed in parallel. The Roman system counted up to the common ancestor and then down to the prospective partner. Thus, a prohibition of the 7th degree meant that one was allowed to marry one's third cousin (that is, someone who one shares great-grandparents with). The Germanic (used by the Franks) system only counted up to the common ancestor. A prohibition to the 7th degree thus meant that one was not allowed to marry any decedents of one's 64 great-great-great-great grandparents. Further disagreement was about exemption of newly converted pagans. Bouchard (1981) and de Jong (1989) locate the (decisive) switch from the Roman to the Germanic counting in the first half of the 9th century.

degree as an impediment. In 1917 it was further decreased to the 3rd degree (banning first and second cousins from marrying), and in 1983 to the 1st degree. The Orthodox Church imposed the ban later and never to the same extent, always allowing third cousins to marry.[10]

The virtual absence and even stigmatization of cousin marriage today in countries that experienced this ban is evidence that eventually the Church (and secular rulers) succeeded in enforcing this rule. A good indication of how seriously the ban was taken is that the nobility in the 10th and 11th century were not marrying (distant) relatives even though it became increasingly hard to find a noble marriage partner (Bouchard, 1981). Studying this time period, the historian de Jong (1998) concludes that avoidance of kin-marriage had become one of the defining criteria of Christianity. Around the time of the reduction of the ban from the 6th to the 3rd degree in 1215, enforcement become less strict. This becomes apparent by a subsequent increase in cousin marriage by the nobility and granting of dispensations (see Donahue, 2008, on the latter).

Transgressions of the ban had serious consequences. Consanguineous marriages were annulled, and willful transgressors were faced with severe punishment like excommunication. Often Church rules were given legal sanctions by secular rules. For example, in Anglo-Saxon England punishment for consanguineous marriage was slavery (Goody, 1983), while in the Visigoth kingdom punishment was perpetual penance and entry into a monastery (Archibald, 2001). Furthermore, in writings and preachings the danger of 'pollution of the blood" was emphasized. This can be considered to be strategically aimed at influencing attitudes as it seems to have been clear to the clergy that the idea of 'pollution' could not be traced from the bible (Rolker, 2012). This likely contributed to a shift in norms (and also increased social pressure and reporting of transgressions). According to the historian Mitterauer (2010) "We find it difficult to comprehend today just how preoccupied the era was with the fear of incest …".

As a consequence of these policies and their enforcement, extended families lost control over the marriages of their members destroying the lineage structure in society (de Jong , Mitterauer, 2010; Greif, 2005, Brundage, p. 225).[11] With the extensive ban up to the 7th degree in the Western Church it is unlikely that a marriage partner could be found in close proximity, which forced individuals to relocate to marry. The ban only up to third cousins in the Eastern Church might still have allowed people to stay within the same village or move to a closer place (the number of prohibited marriage partners increases exponentially in the prohibited degrees). According to Mitterauer (2010), the enforcement was also generally stronger in the Western

[10] At the council of Trullo in 692 the Greek Church condemned cousin marriage (probably up to second cousin). The Isaurian emperors, Leo (685-741) and Constantinus (718–775), forbade marriage in the 6th degree and not long afterwards it was extended to the 7th degree (Roman counting). Thus, third cousins were always allowed to marry. This restriction is in place up to today in the Greek Orthodox Church (Addis, 1961).

[11] See also Korotayev (2003). Based on the Ethnographic Atlas, he finds a negative relationship between lineages and Christianity

Church compared to the Eastern Church.[12] Thus, patrilineal kinship structures were less affected in the sphere of the Orthodox compared to the Western Church (Mitterauer, 2010).

Historians have discussed several reasons why the Church implemented this extensive ban on consanguinity. The Bible does not put restrictions on cousin marriage; incest is dealt with in Leviticus 18 and 20 but cousin marriage is not forbidden. Mitterauer (2010) and Goody (1983) emphasize that the Church had financial motives for enforcing this ban. Weakening the extended family increased the likelihood that an individual's bequest would fall to the Church. Similarly, the Church and political leaders most likely had a good understanding that weak extended families would aid them in manifesting and consolidating their power over clans, lineages and pagan traditions (see Ausenda 1999, p. 148). This may have also been the reason why Christian kings endorsed the ban and incorporated it into secular law or pagan rulers adopted Christianity. An understanding of the social implications, already in the early medieval times, is highlighted by the writings of St. Augustine (354-430). He emphasized the increase in social cohesion that is brought about by not marrying kin:

> "Who would doubt, however, that the state of things at the present time is more virtuous, now that marriage between cousins is prohibited? And this is not only because of the multiplication of kinship bonds just discussed: it is not merely because, if one person cannot stand in a dual relationship when this can be divided between two persons, the number of family ties is thereby increased." (Augustine, 1998, p. 665-667).

Western democracy did not start with the writings and ideas of Hobbes and Locke, Montesquieu and Rousseau, or the emergence of formal constitutions and parlaments in the 17th and 18th century. In line with historians like Michael Mitterauer I argue that democratic ideas and the formalizations of constitutions are in continuation of societal changes that take its root in the early medieval times. Councils, often called 'parlamentum', where decisions were implemented by majority votes are already known from the medieval times. The loosening kin-networks lead to other social arrangements like vassalage. Vassalage entailed duties like mandatory military service but also rights, e.g. giving advice to the overlord at councils like the Holy Roman's Empire's Hoftag. This arrangement is in contrast to other societies with strong extended kin-groups. A natural question than arises how the Arabic expansion in the 7th and 8th century and the Ottoman empire (14th to 19th century) could be sustained over several centuries in societies with strong extended kin-groups. One likely answer is that these empires relayed heavily on male slaves that were bought (in thousands) as children (in mostly non-Muslim countries) and subsequently trained as warriors or administrative elites (mamelukes "*slaves on horse*" in the case of the Arabic expansion and

[12] For example, marriage within the forbidden degrees was in line with Patriarch Alexius Studites' (1025-43) ruling that consanguineous marriages may be valid if there was genuine ignorance of the relationship. It thus became practice to claim ignorance. In 1166 the Synode of Constantinople decided that ignorance was not a sufficient excuse and the marriages had to be dissolved (Angold, 1995).

Janissaries in the Ottoman empire). Thus, the ruling elite could rely on people that were cut off their family ties (and also had no political participation – except through military revolt).[13]

4.2 Data on duration of church ban and identification

Identification - Importantly for this identification strategy, the duration and extent of the Church's marriage rules were exogenous to the inhabitants. In many instances Christianization in the medieval ages was imposed top down. For example, the conversion to Christianity of the Saxons in Northern Germany was enforced following their defeat in 782 to Charles the Great – people who refused to convert were executed. Similarly, historical sources suggest that the decisive shift to Christianity occurred in England in 655 when the (pagan) King Penda was slain in battle.[14] Crusades were launched against the Baltic States, Finland and pagan Prussia (between 1193 and 1316) to convert the inhabitants to Christianity. In Poland and what is now the Czech Republic, Christianization was accompanied by uprisings. Evidence for top-down Christianization are also found in historical sources describing the mass baptism of Kiev in the Dnieper River in 988, as ordered by Vladimir.[15] Also the decision for either the Western or the Eastern Church was hardly foreseeable. For example, Tsar Boris in Bulgaria was leaning to the Western Church. However, after a successful attack the Byzantine Empire demanded conversion to Eastern Christianity. Clearly, ordinary inhabitants also had no direct way to influence or stop the introduction of the Church's marriage legislation. Letters between the Pope and his bishops demonstrate initial opposition to the ban by newly-Christianized English (see e.g. de Jong, 1989). This is evidence against an already existing negative attitude (independent of the Church) against cousin marriage.

Another source of variation comes from the conquest of areas previously under the Church's marriage rules by rulers with other religions. Examples are the conquest of the Hispanic Peninsula by the Islamic Umayyad from the Christian Visigoths in 711, the Arab conquest of Sicily around the year 900, or the campaigns of the Ottoman Empire beginning in the 14th century which resulted in large parts of the Balkans falling under its rule. Certainly the Mongol invasion of the Kievan Rus' between 1223 and 1480 in what is now Russia, Belarus and Ukraine also led to a disruption in the Eastern Church's enforcement of its marriage laws. Even though the Christian religion was not forbidden, it is clear that the Church could not enforce the ban on consanguineous marriages in the same way. A non-negligible fraction converted to Islam. Clearly the outcomes of wars in the medieval ages were somewhat random – often hinging on the decision of a single person or weather conditions. For example, bad weather

[13] An exception is the Mameluke rule in Egypt, where they elected the Sultan.
[14] See also the law codes of Ine King of Wessex (688-726). For failing to baptize a child within 30 days of birth, people had to pay 30 Shillings as a penalty.
[15] According to anecdotes Vladimir was looking for a religion and considered Islam, as well as the Western Church. However, he did not like the idea of alcohol prohibition in Islam and found no beauty in the gloomy churches of the Germans, so he decided for the Orthodox Church. While it is not clear how much truth there is in this it nevertheless demonstrates that having the decision rest on one person probably introduced a considerable degree of randomness, as the decision may have been dependent on short term considerations.

conditions caused the Ottoman forces to leave their heavy canons in Hungary when besieging Vienna in 1529 (they ultimately retreated unsuccessfully). Similarly, some historians attribute the (then pagan) Hungarians' loss against Otto in 955 to the bad weather conditions (which caused the Hungarians to remove their bows to protect them from rain).

Taken together, it is reasonable to assume that the Church's marriage legislation in a given area and its duration were exogenous to the inhabitants. They could not influence the introduction of this law, and a religion was often imposed on them in a top-down manner as a consequence of lost wars. As such, the extent of the ban and the duration an area was governed by the ban exhibit exogenous variation. The IV does not exclude the possibility that the Church brought other innovations with it; controlling for the proportion of Christians makes a religious factor that is inherent to Christian beliefs and its moral teaching as an alternative explanation unlikely. Further, the possibility for some other institutional innovation driving the results is mitigated by the different extent of the ban of the Eastern and Western Church, which both share essentially the same religion and are both in the Roman tradition. In section 5, I use kin-terms as a second IV and also exclude European countries from the sample.

Data - I constructed the variable 'duration of the Church's ban on consanguineous marriages' that captures the duration for which a present-day country experienced the Church's ban up to the year 1500. I created two separate indicators: one for the Western Church and one for the Eastern Church. The Western Church's ban was more encompassing and started earlier (I use the year 506 as the starting value, when the council of Agde forbade cousin marriage). In the Eastern Church the cousin marriage ban was only imposed later (at the council of Trullo in 692) and was not as encompassing.[16] The duration is based on widely accepted dates of Christianization. Thus, the source of exogenous variation comes not only from the duration of the cousin marriage ban but also from the differing extent and enforcement of the ban in the Eastern and Western Churches.

[16] Using the duration of up to the year 1500 allows to straightforwardly construct an ancestor-adjusted measure for the Church's cousin marriage ban based on Putterman and Weil (2010)'s migration matrix. Apart from this practical implication, the cut-off is justified for several reasons. Importantly, the peak in the enforcement and the extent of the ban was before the year 1500. After 1500 no non-Christian ruler (favouring cousin marriage) took power in Western Europe. Nevertheless, the Reformation occurred in 1517, formally lifting the ban on cousin marriage in Protestant areas. By this time all the areas affected by the Reformation already had a long history with the cousin marriage ban (about 300 years in Finland, 500 in Sweden, 650 in the Czech Republic, and around 730 in Germany). After such a long duration and propagation of the ban, it is likely that cousin marriage was stigmatized and avoided even in the absence of a ban. Moreover, in Sweden (and with it the area of today's Finland) the Lutheran Church prohibited first cousin marriage until 1829. The trend in Protestant Germany and Switzerland was likewise a return to the Catholic canonical standards (Harrington, 1995). Some imprecisions arise due to the Christianization of indigenous people in the Americas and Philippines after the 1500s (other than that there are no other areas with considerable Christianization by the Catholic Church before the 19th century). In these countries, the Catholic Church exempted the newly Christianised people from the full extent of the ban and, apart from the Philippines, the native population makes up only a very small fraction of today's population. Constructing a separate measure for the Orthodox Church not only captures that the ban was not as encompassing in the East but also that the Church's influence was not as powerful due to the Mongol invasion and Ottoman rule starting in the 1500s. While Christians were not persecuted, they experienced repercussions, e.g. Jizya, a tax on non-Muslims which made a switch of religion worthwhile. Thus, while the approach does not allow to disentangle these two factors, all these factors lead to a less severe ban and enforcement thereof by the Eastern Church. Nevertheless, this measure is an approximation of the duration of the average ancestor's duration under the ban.

The discovery of the New World witnessed large migration flows. A large proportion of the inhabitants of the Americas and other ex-colonies are descendants from Europe, and they brought their family systems with them. To account for this migration, I constructed an ancestor-adjusted index using the migration matrix from Putterman and Weil (2010). The adjusted measure captures the average duration a person's ancestor lived under the Church's cousin marriage ban (up to the year 1500) in a given country today (see figure B.2 and B.3 in the appendix for the world distribution).

4.3 Reduced-form estimates: The Church's ban and medieval development

In this section I establish a link between the duration of the Church's ban and institutional and economic indicators. This reduced-form relationship is particularly interesting in the historical context (where data on marriage patterns is not available). If indeed the large transformation in societies' network structures under the Church ban started in the 5th century and gained momentum in the 8th century, then there should be early indications of this effect in the 15th century. The left panel of Figure 2 reveals a clear relation between the duration of the Church's marriage ban and population density.

I do not argue that marriage patterns are the only factors that matter today, particularly in rich Western societies - many decisive developments in Europe have occurred subsequently. However, it may have constituted a critical juncture, changing the network structure, values or even the psychology of individuals which subsequently made institutional developments and other innovations possible. Thus, while marriage patterns likely have a direct impact on institutions, the duration (and timing) of the Church's ban most likely also impacted values and the development of formal institutions in the long run. The relation between the duration of the ban and Hofstede's measure for individualism is apparent in the right hand panel of Figure 2;

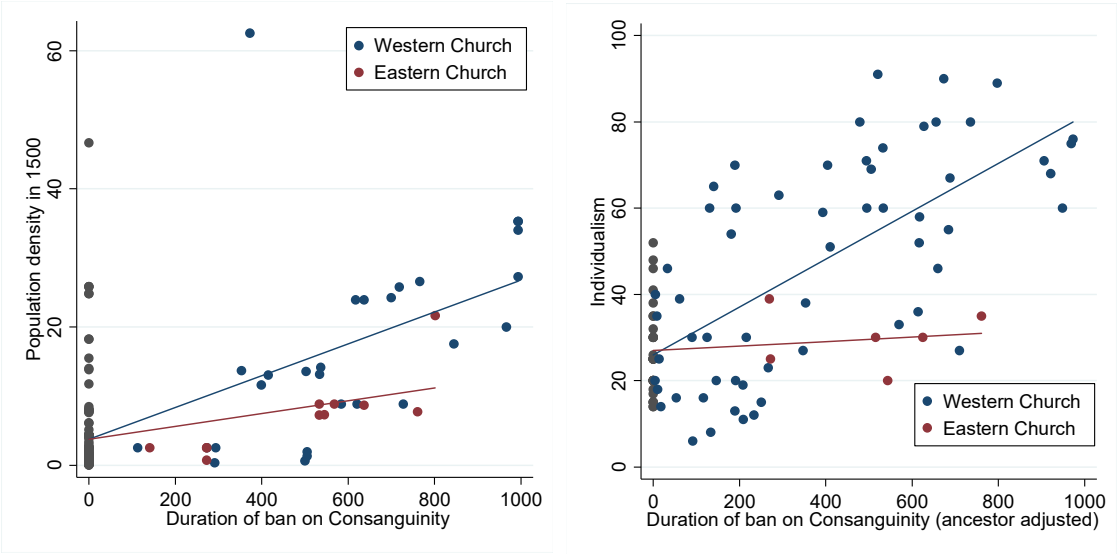


Figure 2: Relation of the duration of the ban on consanguineous marriages and population density (left hand side) and Individualism (right hand side).

a longer duration of the ban is associated with more individualism. Again the relation is more pronounced for the Western Church with its more extensive ban (and no history of rulers following a non-Christian religion like in the Ottoman Empire after 1500). I leave an in depth analysis of the impact of family systems on values for future research.

I use two indicators for historic economic and institutional development. One is population density. The rationale for this indicator is that in the precolonial Malthusian era, economic gains led to a larger but not richer population. I use the data on worldwide population density in 1000 CE and 1500 CE based on McEvedy and Jones (1978), as used by Ashraf and Galor (2013). Having two data points allows me to include country fixed effects. My second measure is the state antiquity index (see Bockstette et al., 2002; and Borcan et al., 2014). The index gives scores from 0 to 50 for the presence of a supra-tribal polity. It measures the degree to which each of the present-day countries was the site of nation states, kingdoms, or empires. Data is compiled for each half century from the years 1 to 1950 AD. I use the data from 450 to 1500. Exploiting the panel structure allows to captures changes in this time period while ruling out estimation biases due to any time-invariant omitted variables like geography, already-existing differences in cultural values and genetic factors at the country level.

Explanatory variables are the duration of the ban under both the Eastern and the Western Churches (up to the year 1500). For the Western Church I expect to find a larger effect, as the ban was more encompassing and enforcement stronger compared to the Eastern Church.

Table 3 reports regressions linking the Church's ban and economic indicators of the Middle Ages. Column (1) and (4) reports country fixed-effects regression with population density in 1000 and 1500 and the State Antiquity Index as dependent variables respectively. Further, I run cross-country regressions with population density (columns 2 and 3) and the state antiquity index (columns 5 and 6) in the year 1500 as dependent variables to investigate the influence of geographical and other historical factors prior to Christianization. In column (3) and (6) I control for genetic heterogeneity according to Ashraf and Galor (2013). They propose genetic heterogeneity as an explanation for differences in economic prosperity. is favorable for innovation while at the same time a high level of heterogeneity leads to more conflicts. Genetic heterogeneity in Europe is around the optimal level. I also control for initial geographical and biogeographical factors by including the timing of the Neolithic transition (column 2 and 5).

The regression results in table 3 reveal that there is a significant relationship between the duration of the Church's ban and population density (column 1 to 3). As hypothesized this relationship is more pronounced for the regions under the influence of the Western Church as the ban encompassed more degrees of kinship. The country fixed-effects regressions in column (1) reveal that an additional 100 years of exposure to the Church's ban is associated with a 17 percent increase in population density in the West and a 12 percent increase in the East. The difference between the two coefficients is highly significant ($F(2,123) = 71.77$, $p<0.0001$). In

	(1) Log Pop. Density FE	(2) Log Pop. density 1500	(3) Log Pop. density 1500	(4) State Antiquity FE	(5) State Antiquity 1500	(6) State Antiquity 1500
Dur. Western Church Ban	0.0017***	0.0024***	0.0024***	0.0205***	0.0136***	0.0160***
	(0.0001)	(0.0002)	(0.0003)	(0.0069)	(0.0039)	(0.0039)
Dur. Eastern Church Ban	0.0012***	0.0011***	0.0016***	0.0118**	-0.0070	0.0047
	(0.0004)	(0.0004)	(0.0004)	(0.0047)	(0.0077)	(0.0074)
Neolithic transition		0.0002***			0.0034***	
		(0.0000)			(0.0006)	
Genetic Heterogen.			211.9307***			2943.2582***
			(69.6372)			(990.7010)
Genetic Heterogen. Sqrd			-151.6157***			-2102.9489***
			(51.8109)			(736.7530)
Log Land suitable for agricult.						
Log Percentage arable land						
Log Absolute latitude						
Constant	0.7142***	-0.0767	-72.9455***	18.4246***	8.9446***	-1000.8429***
	(0.0130)	(0.2169)	(23.1670)	(0.2768)	(2.9211)	(330.2426)
Country fixed effects	Yes			Yes		
N	248	138	138	2660	133	133
R^2	0.337	0.345	0.361	0.036	0.254	0.236

Table 3: OLS regression of the duration of the Church's ban on population density and State formation (up to 1500). Column (1) and (3) report country fixed effects regression. Controls in the cross-country regressions are genetic heterogeneity (and genetic heterogeneity squared) in column (3) and (6); and the timing of the Neolithic Transformation in column (4) and (6). Robust standard errors are in parenthesis. *p < 0.10, **p < 0.05, ***p < 0.01.

line with Diamond (1997) and Putterman (2008), column (2) reveals that the timing of the Neolithic transformation has a significant positive impact on population density in 1500. Occurrence of the Neolithic transformation 100 years earlier is associated with a 2 percent higher population density. Ashraf and Galor (2013)'s finding of a hump-shaped relationship is robust to the inclusion of the duration of the Church's ban (column 3).

The state antiquity index as dependent variable reveals very similar patterns (column 4 to 6). In all columns the duration of the Western Church's ban is a significant predictor of state formation. Again the fixed effects regression in column (4) reveals a significant lower (albeit significant) impact of the Eastern Church's ban ($F(2, 132) = 7.57$, p=0.0008), while the coefficients are not significant in the cross-country regressions (column 5 and 6).

These reduced from regressions establish a link between the Church's rule and economic and institutional outcomes. Given that Christianization was mostly top-down (and often introduced after battles where outcomes carried a random component) and country fixed effects are controlled for, it is likely that the duration of the Church's rule impacted economic and institutional outcomes already in the medieval ages. Of course, the Church brought with it not only marriage regulations. So other Church-related factors may drive the results. In the subsequent analysis I show that policies impacting marriage patterns are most likely the decisive factor.

4.4 IV-estimates: Cousin marriage instrumented by the Church's ban

To investigate the causal impact of marriage patterns on today's institutional quality I turn to IV estimation. Table 4 reports two stage IV regressions with democracy as the dependent variable and the percentage of cousin marriage as the explanatory variable. The percentage of cousin marriage is instrumented with the duration of the ban on consanguineous marriages under the Eastern and Western Churches. I include several contemporary covariates: Education (column 2) GDP per capita column (3), ethnolinguistic fractionalization and legal origins column (4), and the fraction of Christians (column 6). Column (5) contains controls for the timing of the Neolithic transformation and latitude – variables describing geographical or even "deeper" historical events than the Church's cousin marriage ban.

Table 4, column 1, reveals a highly significant and large coefficient for the percentage of cousin marriage. A 10 percentage point higher cousin marriage rate decreases the Polity IV democracy score by about 4.1 units. Controlling for several covariates leads to similar estimates. Using the alternative (but coarser) measure 'cousin marriage preferred' as explanatory variable reveals similarly strong and significant results in this enlarged sample (see tables A.1 in the appendix). The same is true when using alternative indicators for formal institutions (see table A.2 and A.3 in the appendix). Again the results also hold when using a historic measure for institutional quality: constraints on executive between 1901 and 1910 (see table A3, column 11 and 12).

	(1) Democracy IV: Church's ban	(2) Democracy IV: Church's ban	(3) Democracy IV: Church's ban	(4) Democracy IV: Church's ban	(5) Democracy IV: Church's ban	(6) Democracy IV: Church's ban
%-Cousin Marriage	**-0.410*****	**-0.562*****	**-0.443*****	**-0.457*****	**-0.412*****	**-0.542*****
	(0.042)	**(0.146)**	**(0.041)**	**(0.062)**	**(0.055)**	**(0.116)**
Education		-15.010				
		(14.032)				
GDP per capita			-0.064			
			(0.063)			
UK legal origin				3.894		
				(2.466)		
French legal origin				3.242		
				(2.258)		
Ethnolinguistic Fractionalization				1.240		
				(3.451)		
Neolithic Transformation					0.000	
					(0.000)	
Absolute Latitude					0.347	
					(0.804)	
Fraction Christians						-4.293
						(3.382)
Cons	9.599***	21.300*	10.853***	6.913***	7.104***	13.570***
	(0.320)	(11.008)	(1.341)	(1.817)	(2.539)	(2.984)
N	68	68	68	68	68	68
Wald-test chi2	93.02	72.21	122.5	82.49	91.65	64.23
F-stat 1st stage excl. instr.	26.00***	5.654***	20.78***	24.84***	22.39***	10.36***

Table 4: Dependent variable is democracy (ranges between -10 and 10) from the polity IV data set. Explanatory variable is '% of cousin marriage'. '%-Cousin Marriage' is instrumented by the duration of the Western and Eastern Church's ban on consanguineous marriages up to 1500 (bold). Additional covariates are Education from the UN education index in the year 2005, the GDP per capita in 2000, dummy variables indicating whether a country has UK or French legal origins (La Porta et al., 2008), ethnolinguistic fractionalization as used by Ashraf and Galor (2013), the years since the Neolithic transformation (Putterman, 2008), absolute latitude as used by Acemoglu et al. (2001) and the fraction of Christians in a country (Barro and McCleary, 2003). Robust standard errors are reported in parenthesis. *p < 0.10, **p < 0.05, ***p < 0.01.

5. IV estimates: Kinship terminology, marriage patterns and institutional development

To strengthen the argument that family structures impact institutional outcomes, I make use of an additional IV: cousin-terms. The association between kin-terminology and marriage patterns has long been recognized and is well-established in Anthropology (see. e.g. Morgan, 1870). In many societies differentiated cousin-terms are prescriptive of the people one can/should or is forbidden to marry. For example, in the Iroquois kinship system parallel cousins (e.g. father's brother's daughter) are likewise called brother and sister – a clear indication of an incest taboo against parallel cousin marriage. Cross-cousins (e.g. father's sister's daughter) are termed differently and often times are preferred marriage partners.

The Ethnographic Atlas classifies cousin-terms into 6 categories, which are common in Anthropological literature (Descriptive/Sudanese, Iroquois, Omaha, Crow, Hawaiian, Eskimo). The Eskimo and Hawaiian kin terminologies do not distinguish cousins, while the others do.[17] The Ethnographic Atlas has data for both cousin terminology and cousin marriage patterns for more than 845 ethnicities. It reveals a strong association between cousin-terms and marriage patterns on the ethnicity level. While cousin marriage is preferred in about 40% percent of the ethnicities which bilaterally differentiate cousin terms, this is the case for only 7% percent of those that do not differentiate cousin terms.

Transitory recent events like wars, or regime and institutional change (e.g. inheritance laws) may have an immediate effect both on marriage patterns and democracy. Underlying this identification strategy is the idea that kin-terms do not have a direct effect on institutional outcomes other than through family systems. Clearly, language only evolves very slowly, and thus kin-terms do not reflect recent societal changes. Following Tabellini (2008) and Licht et al. (2007) I use language as an IV to rule out that contemporary, possibly-omitted factors bias the estimates. At the same time language is not fixed but changes as a result of historical events, migration, agricultural techniques, cultural exchanges, and new ideas. Further, due to the sluggish adjustment of kin-terms the factors that gave rise to the change may not exist anymore - Tabellini (2008) refers to the randomness of history. Thus, in line with the literature on deep factors it can demonstrate that historically distant events shape institutional and economic development. An obvious advantage of this IV is its close association with family systems; compared to other IVs like genetic distance (which can only instrument culture more generally) or pronoun dropping the link with marriage patterns is well-established in the anthropological literature.

Intriguingly, there is a clear indication that the Church's ban on consanguineous marriages had an impact on kin-terms. According to Mitterauer (2010), initially all the Indo-European languages in Europe distinguished between paternal and maternal relatives and only later did

[17] In contrast to Hawaiian kin-terminology, where all cousins are called brother or sister, Eskimo kin-terminology (e.g. English, German, or Spanish) puts more emphasis on the nuclear family by distinguishing siblings from cousins.

this distinction disappear. According to him the decisive factor in the transformation of kinship terminology for Germanic and Slavic languages was Christianity, in particular the Church's ban on kin-marriages. This change in kin-terms reveals an astonishing chronological pattern reflecting the start of the Church's ban in a given area. The first Germanic language to undergo this change was English (beginning with the Norman conquest), followed by German, then Swedish (where some differentiation still exists). In the Slavic language the process took place first in Czech and Polish and relatively late in Russian. The Slavic languages in the Balkans have retained the differentiating terminology for paternal and maternal uncle and aunt, while there is no differentiation in cousin terms anymore.

Using kin-terminology as a IV has the feature that the source of variation does not only stem from Europe. Thus, as a robustness check, I restrict the IV analysis to countries where the inhabitant's ancestors were not exposed to the Church's ban on consanguineous marriages. This makes it unlikely for an omitted uniquely-European factor to coincidently drive the results that marriage patterns impact institutional development.

Based on the aggregated Ethnographic Atlas data, I use a variable that captures the proportion of people in a country that distinguish cousin terms. As Europe is underrepresented in the Ethnographic Atlas, I amended missing values for European countries (and also some other countries where data was available - see figure A4 in the appendix for the world distribution). This variable exhibits a high correlation with the percentage of cousin marriages (Spearman's Rho: 0.73, $p<0.0001$, N=72).

Table 5 reports two stage least square regression with '%-Cousin Marriage' instrumented by cousin-terms in column (1) to (4). Additional controls are GDP per capita, ethnolinguistic fractionalization and legal origins (in column 2), the timing of the Neolithic transformation and latitude (column 3), and the fraction of Christians (column 4). To test for overidenfication restrictions all IVs (the duration of the Western and Eastern Churches' ban as well as cousin-terms) are used in columns (5) to (8) simultaneously. It is apparent that the estimates for '%-Cousin Marriage' are highly significant and comparable in size when instead of cousin-terms the duration of the Churches' bans were used as IVs (see table 4) or all IVs were used simultaneously (column 4 to 8, table 5). The tests for overidentification suggest that the IVs were correctly excluded (column 4 to 8, table 5).

	(1) Democracy IV: cousin Term	(2) Democracy IV: cousin term	(3) Democracy IV: cousin Term	(4) Democracy IV: cousin term	(5) Democracy IV: c. term + ban	(6) Democracy IV: c. term + ban	(7) Democracy IV: c. term + ban	(8) Democracy IV: c. term + ban
%-Cousin Marriage	**-0.395*****	**-0.435*****	**-0.416*****	**-0.358*****	**-0.402*****	**-0.446*****	**-0.418*****	**-0.392*****
	(0.045)	**(0.053)**	**(0.058)**	**(0.126)**	**(0.042)**	**(0.051)**	**(0.054)**	**(0.117)**
GDP per capita		-0.050				-0.053		
		(0.059)				(0.061)		
UK legal origin		3.650				3.778		
		(2.451)				(2.460)		
French legal origin		2.996				3.089		
		(2.220)				(2.240)		
Ethnolinguistic Fractionalization		0.088				0.302		
		(3.206)				(3.243)		
Neolithic transformation			0.000				0.000	
			(0.000)				(0.000)	
Absolute Latitude Fractionalization			0.373				0.360	
			(0.770)				(0.778)	
Fraction Christian				1.612				0.575
				(4.304)				(4.048)
Constant	9.339***	7.862***	7.157***	8.018**	9.434***	7.892***	7.190***	9.004**
	(0.649)	(2.210)	(2.409)	(4.054)	(0.570)	(2.218)	(2.448)	(3.782)
N	66	66	66	66	66	66	66	66
chi2	78.78	148.1	81.07	121.0	91.60	160.1	90.27	116.0
F-stat 1st stage	119.3***	89.91***	50.65***	14.88***	45.81***	44.25***	25.62***	13.16***
p-values Test for over-id					0.2403	0.1889	0.1557	0.2638

Table 5: Two-stage least square regressions of '%-Cousin Marriage' on democracy (ranges between -10 and 10) according to the Polity IV data set. In column 1 to 4 '%-Cousin Marriage' is instrumented by whether cousin terms are differentiated. In column 5 to 8 it is instrument by cousin-terms and the duration of the Western and Eastern Church's ban on consanguineous marriages up to 1500. Additional covariates are GDP per capita in 2000, dummy variables indicating whether a country has UK or French legal origins (La Porta et al., 2008), ethnolinguistic fractionalization as used by Ashraf and Galor (2013), the years since the Neolithic transformation (Putterman, 2008), absolute latitude and the fraction of Christians in a country (Barro and McCleary, 2003). Reported are also the Wald Chi 2 for joint significance, the F-stat of the excluded instruments in the 1st stage regression, the p-values of the test for overidentification. Robust standard errors in parenthesis. *p < 0.10, **p < 0.05, ***p < 0.01.

Excluding countries affected by the Church's ban - So far I have focused on the world sample. Identification via the duration of the Church's ban largely rests on the share of people with ancestors who experienced the ban. Could it be that some other omitted European variable or other institutional innovation by the Church that impacts institutional quality through a different channel than extended kin-network structures? The variation in the duration and extent of the ban (between the Eastern and Western Church) within Europe mitigates this possibility somewhat. Historical differences in family structures reflected in cousin-terms do not (solely) rest on the European experience of the ban. This allows to exclude all countries that have a sizeable population with European descent and still do IV estimation. Thus, the estimates are not based on the European experience (most likely kin-terms rest on biogeographical conditions). If the estimation from this regression leads to qualitatively similar estimates this is a good indication that extended kin-groups have a causal impact on institutional quality.

Table 6, column (1) reports the regression of democracy on the percentage of cousin marriages using cousin-terms as IV. Column (2) excludes all European countries. In column (3) all countries where the average person's ancestors have a history of experiencing the Church's ban for more than 4 generations (120 years) are excluded. This includes all European countries, most countries in the Americas, and countries like South Africa, New Zealand, Australia and

	(1) Democracy IV: cousin-term	(2) Democracy IV: cousin-term	(3) Democracy IV: cousin-term	(4) Democracy IV: cousin-term	(5) Democracy IV: cousin-term	(6) Democracy IV: cousin-term
%-Cousin Marriage	**-0.395*****	**-0.378*****	**-0.438*****	**-0.503*****	**-0.503*****	**-0.474*****
	(0.045)	**(0.053)**	**(0.131)**	**(0.154)**	**(0.154)**	**(0.181)**
Asia				3.766	3.760	1.016
				(4.496)	(4.494)	(5.139)
Africa				5.350	5.343	2.947
				(4.896)	(4.894)	(5.982)
Oceania				2.014**	2.014**	
				(1.010)	(1.010)	
Europe				1.807*		
				(1.021)		
_cons	9.339***	8.800***	10.657***	8.305***	8.304***	10.114***
	(0.649)	(1.101)	(3.961)	(1.036)	(1.036)	(0.426)
N	66	50	31	66	50	31
Wald-stat chi2	78.78	50.12	11.14	119.4	116.9	98.52
F-stat (1st – stage)	119.3***	91.38***	11.17***	10.98***	10.87***	6.442**

Table 6: Two stage least squares estimates of the percentage of cousin marriages on democracy in sub-samples. The percentage of cousin marriages is instrumented with cousin-terms. In column (2) and (4) European countries are excluded and in column (3) and (6) countries with a considerable fraction of ancestors with a European background. Robust standard errors are in parenthesis. *p < 0.10, **p < 0.05, ***p < 0.01.

Israel. Excluding these countries is an important robustness check as it allows to demonstrate that the effect of marriage patterns on institutional development does *not only* rest on the

European experience, but holds more generally. Column (4) to (6) includes continent dummies. The estimations in the restricted sample reveal highly significant coefficients for the 5- of cousin marriage. Strikingly, they are quantitatively very similar in all the sub-samples. Due to the low sample size the IV estimations may become biased. Appendix A.2 (column 7 to 10) reports the results of the larger sample with the coarser measure (the dummy variable for whether cousin marriage is predominantly preferred in a present-day country or not). Again the coefficients are highly significant and quantitatively similar compared to the whole sample. This evidence makes a genuinely-European omitted trait (other than through family systems) as an alternative explanation unlikely.

6. Within-country results

The cross-country analysis may fail to fully control for unobserved factors at the country level. The within-country analysis allows me to demonstrate the relation between family systems and the proper functioning of institutions while controlling for country fixed effect. Family systems and marriage patterns can vary considerably within a country. Italy has long been used as an example highlighting regional differences in institutional quality. For example, Putnam (1993) pointed out that local government is much less efficient in the South than the North, even though the formal institutions at the national level are the same. To explain the differences, he suggested historical reasons.

Guiso et al. (2005) suggest that the North-South gap is due to the lack of a free city-state experience in the South. Following Greif (2005) an important factor for the advancement of

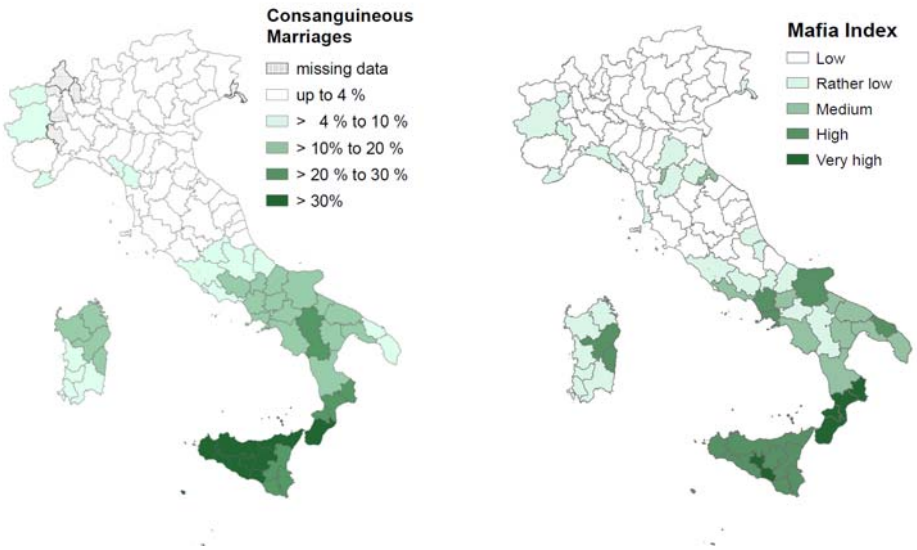


Figure 3: Cousin marriages (between 1960 to 1964, left hand side) and the Mafia Index (between 2000 and 2004, right hand side).

free city-states in the North and the backwardness in the South may be attributable to family structures. Figures 3 (left panel) displays the percentage of cousin marriage in Italy at around 1960 (data from Cavalli-Sforza et al., 2004). The South of Italy exhibits a large percentage of cousin marriages. Figure 3b (right panel) displays the Mafia Index – an index capturing activity such as 'pizzo' (extortion), attempted and successful mafia murders, kidnapping, arson, bomb or fire attacks, (see Calderoni, 2011). It thus reflects the failure of institutions to curb mafia activity. The strong association is apparent (Spearman rho: 0.79, $p < 0.0001$, N=87). This finding is consistent with the idea that the Church marriage regulations changed social cohesion affecting moral behavior and the functioning of formal institutions; the north of Italy experienced a considerably longer duration of the Western Church's ban. Sicily was under Arab rule until around the beginning of the 11th century, while mainland South Italy and Sardinia were under the influence of the Byzantine Empire and the Orthodox Church. Of course, the north and the south of Italy not only differ in their different past experience of marriage legislation: e. g. the South is more mountainous, differs also in agriculture and belonged to different political entities also after the beginning of the 11th century. Nevertheless, the highly significant association is robust to controlling with dummy variables for the North/South difference or the different southern political entities in OLS regressions (see appendix A.4). This demonstrates that even within the North and South of Italy consanguinity is predictive of mafia activity. The data is therefore consistent with the idea that stronger extended families impede the proper functioning of institutions.

Apart from Italy I do not have regional data on consanguinity for whole countries. To strengthen the point that family structures and the Church marriage regulations impact on institutions and democracy I turn to the World Values Survey and the European Value Study. These surveys have a large amount of respondents within a country – allowing to exploit within

country variation. The survey data also allows to control for covariates like religion and education at the individual level. Again I use IV-estimation to assess causality exploiting within country variation in the duration of the ban in three countries. Like Italy, Spain and Portugal also experienced within country variation in the duration of the Western Church marriage ban. The South of the Hispanic peninsula was ruled by Islamic leaders and was taken back gradually by the Reconquista creating variation in the duration of the Church rule (other than Italy the North and South subsequently did not belong to different political entities). Today's administrative units cannot be precisely mapped onto the duration of the Church's ban (e.g. at a given point in time the Reconquista in Spain gained only part of the territory that makes up a region in Spain today). As such the regional duration of the ban is an approximation (where I approximated region averages).

I created an indicator of 'societal marriage pressure' (SMP). This indicator captures the degree an individual believes a successful marriage is determined by societal pressures and not by individual's love and affection for each other. To construct the indicator, I used peoples rating on how important the same social background (4: very important; 1: not important), religious beliefs (4: very important; 1: not important), children (4: very important; 1: not important), being apart from in-laws (-4: very important; -1: not important), happy sexual relationship (-4: very important; -1: not important) and sharing household chores (-4: very important; -1: not important) are for a successful marriage. The first three questions relate to factors that are to a larger degree determined by societal or family pressures outside the realm of love and affection, while the last three focuses on the nuclear couple. The latter three questions thus enter with a negative sign. At the country level SMP exhibits a highly significant correlation with the '%-Cousin Marriage' (Spearman's rho: 0.57, p=0.0014, N=28).

I use two dependent variables: Firstly, the preference for undemocratic rule. It is the principal component based on ratings of two statements: "Having a strong leader who does not have to bother with parliament and elections" and "Having the army rule" on a 4-point scale (with 1 being very bad and 4 being very good). On a country level preference for an undemocratic rule exhibits a significant correlation with both '%-Cousin Marriage' (Spearman rho: 0.58, p<0.0001, N=57) as well as the SMP (Spearman's rho: 0.53, p<0.0001, N=56). Secondly, I use a measure of generalized morality based on Tabellini (2008). It is the principal component of the WVS-trust question and people's valuation of "tolerance and respect for other people" as a value to transmit to children. On the country level it likewise exhibits a (weak) negative correlation with '%-Cousin Marriage' (Spearman's rho: -0.22, p=0.0970, N=60) and SMP (Spearman's rho: -0.64, p<0.0001, N=56).

Table 7 uses within country variation and reports the regression estimates of SMP on the preference for an undemocratic leader and limited morality. Column (1, 2, 4, and 5) are country fixed effects OLS estimates, while column (3) and (6) are two stage least square country fixed effects estimates where the SMP is instrumented with the duration of the Western Church's

ban. Column (1) and (3) contain the whole sample of 46 countries, while the other columns are restricted to the sub-sample (Italy, Spain, Portugal). Covariates are age, age squared, gender, marriage status, dummies for education, religious affiliation, countries and the wave of the survey.

The OLS regression demonstrate that the SMP is a significant predictor for the preference for an undemocratic rule and generalized morality when country fixed effects are controlled for. The effect is stronger in the sub-sample (column 2 and 5) compared to the whole sample containing 46 countries. Similarly, the IV-estimations reveal a weakly significant but quantitatively large effect of SMP on the preference for undemocratic rule (column 3) and a significant negative effect on generalized morality (column 6).[18] Thus, country fixed effects regressions with controls for individual factors like religion and education and using IV-estimations suggest that there is a causal effect of societal marriage pressures on democracy and generalized morality.

	(1)	(2)	(3)	(4)	(5)	(6)
	Undemocratic Rule OLS	Undemocratic Rule OLS	Undemocratic Rule IV: W. Ch. ban	Generalized Morality OLS	Generalized Morality OLS	Generalized Morality IV: W. Ch. ban
Societal Marriage Pressure	0.043***	0.064***	**0.394***	-0.011***	-0.038***	**-0.565****
(SMP)	(0.005)	(0.007)	**(0.212)**	(0.004)	(0.008)	**(0.244)**
Age	-0.006***	-0.011**	-0.010*	0.004***	-0.002	-0.004
	(0.002)	(0.005)	(0.005)	(0.002)	(0.005)	(0.007)
Age squared	0.000**	0.000	-0.000	-0.000*	0.000	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Female	0.018	-0.024	-0.046	0.039***	0.031	0.069*
	(0.012)	(0.025)	(0.032)	(0.012)	(0.027)	(0.041)
Married	-0.041***	0.035	-0.058	0.019	0.022	0.173**
	(0.012)	(0.029)	(0.069)	(0.010)	(0.028)	(0.112)
Constant	0.001	-0.185	0.204	-0.098	1.071***	-0.675**
	(0.188)	(0.137)	(0.235)	(0.168)	(0.150)	(0.277)
Religion Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Education Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Wave dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	63314	5357	5357	58579	5225	5225
F-stat	30.11	91.23		14.39	274.0	
Wald Chi			5188.6			6871.9
F-stat 1st stage for excl. instr.			7.956***			9.149***

Table 7: Societal marriage pressures and undemocratic rule (column 1 to 3) as well as generalized morality (column 4 to 6). Explanatory variable is the indicator of societal marriage pressure (SMP). Covariates are age, age squared, dummy variables for female, married, religious affiliation, education, country and the wave. Column (1, 2, 4, and 5) are country fixed effects OLS regressions, while column (3) and (6) are two stage least square regressions with SMP instrumented by the duration of the Western Church's ban on consanguineous marriages. Instrumented variables are in bold. The sample in column (2,3, 5, 6) contains respondents from Italy, Spain and Portugal. Robust standard errors (clustered on 46 countries in column (1) and (4)) are reported in parenthesis. *p < 0.10, **p < 0.05, ***p < 0.01.

[18] Interestingly, support for Adolf Hitler's party, the NSDAP, was considerably stronger in the Eastern part of the Weimar Republic – an area that experienced a considerable shorter duration of the ban on consanguinity.

7. Discussion and Conclusion

The Church started banning consanguineous marriages in the early medieval ages. This ban – at times extending up to the 7th degree including affinal and spiritual kin in the Western Church – imposed a severe restriction on whom to marry. Introduced exogenously, it constitutes a rare opportunity to study the impact of family structures on economic outcomes.

I demonstrate a strong association between the duration of the Church's ban and institutional development up to the 15th century: a longer duration of the Church's ban on consanguinity is associated with higher population density, and state formation. This reduced-form relationship holds when controlling for country fixed effects making geographical and genetic factors or already existing time invariant cultural differences as alternative explanations unlikely. Using the duration of the ban, both in regions under the spheres of the Western and Eastern Churches, as an IV for cousin marriage and controlling for many contemporary and distant factors like GDP, education and geography points to marriage patterns as an explanation for development of formal institutions and the functioning of democracies today. Using this temporal distant IV is evidence against modernization theory: in line with Acemoglu et al. (2008, 2005) it is more likely that deep historic factors impact democracy.

The Church's ban on consanguineous marriages and Christianization are closely linked. Thus, the question arises whether some other feature of Christianization (apart from the effect through marriage patterns and the dissolution of extended kinship groups) can explain these findings. For several reasons this is unlikely.

Firstly, the country fixed-effects regression of the ban's duration on economic and institutional outcomes in the 1500s, reveals a significantly-stronger effect for the Western Church. This is consistent with the stronger enforcement and larger extent of the ban in the Western Church. An alternative factor would likewise have needed to be stronger in the Western Church. However, the preaching itself rests on the Bible both in the Eastern and Western Churches, and both Rome and the Byzantine Empire were in the Roman tradition.

More importantly though, congruent evidence comes from an additional IV – kin-terms. Kin-terms have long been recognized in anthropological research as reflecting marriage patterns. Kin-terms only change very slowly reflecting distant rather than contemporary events. It is thus unlikely that there is a direct influence on kin-terms other than through its association with family structure and values. Clearly it rules out reverse causation and estimation bias due to contemporary (unobserved) factors like famine, social unrest. The estimation results suggest that marriage patterns causally impact the proper functioning of societies. This IV allows to exclude all European countries in the analysis and, as an even stronger test, all countries that have a sizable proportion of people with ancestors who experienced the Church's ban on kin-marriage. The results paint the same picture: the percentage of cousin marriage has a significantly negative and quantitative very similar impact on institutions and democracy that

does not rest on the European experience alone. This suggests that marriage patterns are a crucial factor explaining democracy.

Further evidence comes from within-country analysis. A prominent example of within country variation is Italy where institutions function less well in the south. Consistent with the cross-country evidence cousin marriage rates (around 1960) were considerably higher in the South of Italy, where also the duration of the Western Church's cousin marriage ban was shorter. Based on the World Value and European Social survey I constructed an indicator of 'Societal Marriage Pressures' (SMP). This approach not only allows to control for unobserved country effects (e.g. unobserved country differences in formal institutions), but also for individual factors like education and religious affiliation. The regressions demonstrate that SMP are associated with a preference for undemocratic rule and a limited morality. To assess causality, I exploit the fact that in three countries (Italy, Spain and Portugal), there is within variation in the duration of the kin-marriage ban and use it as an IV. Again I find an effect of SMP on the preference for an undemocratic rule and limited morality. This is also the case when controlling for religion. It is thus unlikely that the findings are driven by some moral teachings of the Christian religions.

Taken together, the ban on consanguineous marriages – largely imposed exogenously on the population – most likely constitutes a critical juncture that reduced the power of extended kin-groups, changed values, and gave rise to the development of formal institutions. As such, it may be an important prerequisite for Europe's special path that ultimately led to the development of democracy and economic prosperity. However, the relation between strong extended families and the functioning of institutions holds more generally, that is, also when excluding the European experience. I also demonstrate that other than Huntington, (1991) argues it is most likely the specific from of parallel-cousin marriage in Arabic societies that is detrimental to democracy and not Islam per se.

This has important policy implications: to curb rule violations, foster democracy, and build strong functioning formal institutions the potentially deleterious effect of dense family network structures on the societal level has to be taken into account. Simply exporting western institutions like democracy without taken societal preconditions seriously are likely to fail.

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Appendix A – robustness checks

A.1 Alternative indicators for institutional quality and prevalence of rule violation

	(1) Const. on Executive 2001-2010 OLS	(2) Const. on Executive 2001-2010 OLS	(3) Const. on Executive 2001-2010 IV	(4) Const. on Executive 2001-2010 IV	(5) Political Rights 2003-2000	(6) Political Rights 2003-2000	(7) Political Rights 2003-2000	(8) Political Rights 2003-2000	(9) P. of Rule Violation 2003 OLS	(10) P. of Rule Violation 2003 OLS	(11) P. of Rule Violation 2003 IV	(12) P. of Rule Violation 2003 IV
%-Cousin Marriage	-0.09***	-0.10***	**-0.12***	**-0.15***	-0.57***	-0.56***	**-0.80***	**-0.97***	-0.04***	-0.03**	**-0.06***	**-0.04***
	(0.01)	(0.02)	**(0.01)**	**(0.02)**	(0.08)	(0.14)	**(0.08)**	**(0.15)**	(0.01)	(0.01)	**(0.01)**	**(0.01)**
Timing Neolithic tr.		0.06		0.20		-0.12		1.05		0.04		0.07
		(0.11)		(0.13)		(0.78)		(0.87)		(0.05)		(0.05)
Absolute Latitude		0.58***		0.68***		3.52***		4.34***		0.28***		0.30***
		(0.22)		(0.22)		(1.29)		(1.38)		(0.10)		(0.09)
UK legal origins		0.88		1.51*		5.70		10.75*		0.23		0.33
		(0.66)		(0.82)		(4.48)		(5.74)		(0.32)		(0.29)
France legal origins		0.61		1.08*		5.72		9.37**		-0.02		0.13
		(0.58)		(0.65)		(4.04)		(4.47)		(0.27)		(0.25)
Ethnic Linguistic Frac.		0.25		1.54		0.50		11.00*		-0.59		-0.24
		(0.84)		(0.99)		(4.82)		(6.09)		(0.47)		(0.45)
GDP per Capita		-0.01		-0.03		0.24*		0.08		0.08***		0.08***
		(0.02)		(0.02)		(0.12)		(0.14)		(0.01)		(0.01)
Constant	6.35***	3.81***	6.67***	2.74**	32.95***	14.62**	36.21***	6.08	1.03***	-1.11*	1.31***	-1.38***
	(0.20)	(0.98)	(0.19)	(1.19)	(1.49)	(6.57)	(1.30)	(8.26)	(0.21)	(0.57)	(0.22)	(0.50)
N	68	68	66	66	70	70	68	68	66	66	64	64
F	57.33	10.01			49.94	12.94			28.62	26.88		
Wald -chi2			102.4	152.7			107.3	124.6			32.36	238.7
1st stage F-stat of excl. I.			45.81	31.18			46.73	30.14			41.44	38.90

Table A.1: Percent of cousin marriage and institutional indicators. Dependent variables are constraint on the executive from the Polity IV data set (average of 2001 to 2010, column 1 to 4; average of 1901 to 1910, column 5 to 8), Government Effectivity in 2010 of the world banks worldwide governance indicator (column 9 to 12; see Kaufmann et al., 2011), and the Prevalence of Rule Violations in 2003 (column 13 to 16, see Gächter and Schulz, 2016). The table both reports OLS and IV estimation. Estimates for '%-Cousin Marriage' instrumented with the duration of the Eastern and Western church kin-marriage ban and cousin-terms are displayed in bold. Additional controls are the Timing of the Neolithic Transformation (Putterman, 2008), Absolute Latitude (as used by Acemoglu et al., 2001), UK and French legal origins (La Porta et al., 2008), ethnolinguistic fractionalisation and GDP per capita as used by Ashraf and Galor (2013). Robust standard errors are reported in parenthesis. *p < 0.10, **p < 0.05, ***p < 0.01.

A.2 Alternative indicator for explanatory variable: dummy variable whether a majority 'Prefers cousin marriage'

	(1) Democracy OLS	(2) Democracy OLS	(3) Democracy IV: ban c.	(4) Democracy IV: ban c.	(5) Democracy IV: c.-term	(6) Democracy IV: c.-term	(7) Democracy IV: c -term	(8) Democracy IV: c -term	(9) Democracy IV: c -term	(10) Democracy IV: c -term	(11) Democracy IV: ban + c.-term	(12) Democracy IV: ban + c.-term
Cousin marriage Pref.	-5.501***	-5.232***	**-18.035*****	**-17.282*****	**-12.734*****	**-13.587*****	**-10.427*****	**-11.883*****	**-7.995*****	**-11.007****	**-12.857*****	**-14.355*****
	(1.147)	(1.323)	**(2.324)**	**(2.273)**	**(1.837)**	**(2.380)**	**(2.204)**	**(2.802)**	**(2.630)**	**(4.423)**	**(1.815)**	**(2.181)**
Timing Neolithic tr.		-0.428*		0.201		-0.017		-0.095		-0.161		0.025
		(0.241)		(0.332)		(0.300)		(0.359)		(0.455)		(0.299)
Absolute Latitude		1.751***		3.297***		2.737***		2.514***		2.159		2.822***
		(0.627)		(0.769)		(0.799)		(0.804)		(1.378)		(0.804)
UK legal origins		2.179		8.563***		5.885***		9.580***		8.048**		6.282***
		(1.731)		(2.297)		(1.837)		(2.544)		(3.660)		(1.882)
France legal origins		1.937		7.576***		5.311***		8.572***		7.366**		5.662***
		(1.347)		(1.789)		(1.534)		(2.345)		(3.736)		(1.539)
Ethnic Linguistic Frac.		-3.728		-2.101		-1.198		-2.144		-1.836		-1.030
		(2.694)		(3.496)		(3.369)		(3.779)		(4.166)		(3.434)
GDP per Capita		0.052		-0.120**		-0.061		-0.151**		-0.186**		-0.072
		(0.061)		(0.053)		(0.051)		(0.069)		(0.085)		(0.049)
Constant	5.209***	1.530	8.964***	-5.746	7.611***	-3.295	6.088***	-5.327	4.386***	-3.470	7.663***	-3.728
	(0.596)	(2.996)	(0.308)	(4.178)	(0.593)	(4.067)	(1.081)	(4.552)	(1.520)	(5.917)	(0.580)	(4.087)
N	132	132	130	130	118	118	83	83	68	68	117	117
F	23.02	8.839										
Wald -chi2			60.20	146.4	48.05	93.60	22.38	57.52	9.241	33.29	50.21	116.1
1st stage F-stat of excl. I.			30.81	38.04	108.6	54.32	77.47	33.62	43.44	13.65	41.13	38.79

Table A.2: Predominant preference for cousin marriage and democracy. Explanatory variable is the dummy variable whether cousin marriage is predominantly preferred in a country (according to Rijpma and Carmichael, 2013). Column (1) and (2) report OLS regressions. Column (3) and (4) report two stage least square results with 'cousin marriage preferred' instrumented by the duration of the Eastern and Western Churches kin-marriage ban (bold). In column (5) to (10) the instrument is cousin terms (bold). While column (5) and (6) report estimates for the whole sample, column (7) and (8) excludes European countries, and column (9) and (10) excludes all countries with a sizable fraction of individuals with European descent (on average more than 120 years). Column (11) and (12) reports two stage least square estimates with 'Cousin marriage preferred' instrumented by the duration of the Eastern and Western Churches ban on kin-marriage *and* cousin-terms. Additional controls are the Timing of the Neolithic Transformation (Putterman, 2008), Absolute Latitude (as used by Acemoglu et al., 2001), UK and French legal origins (La Porta et al., 2008), ethnolinguistic fractionalisation and GDP per capita as used by Ashraf and Galor (2013). The F-statistic for the OLS and the Wald-statistic for the IV estimations, the 1st stage F-statistic of the excluded instruments are reported. Robust standard errors are reported in parenthesis. *p < 0.10, **p < 0.05, ***p < 0.01.

A.3 Alternative indicator for explanatory variable 'Cousin marriage preferred' and alternative indicators for institutional quality and prevalence of rule violations

	(1) Const. on Executive 2001-2010 OLS	(2) Const. on Executive 2001-2010 OLS	(3) Const. on Executive 2001-2010 IV	(4) Const. on Executive 2001-2010 IV	(5) Const. on Executive 1901-1910 OLS	(6) Const. on Executive 1901-1910 OLS	(7) Const. on Executive 1901-1910 IV	(8) Const. on Executive 1901-1910 IV	(9) Political Rights 2003-2000 OLS	(10) Political Rights 2003-2000 OLS	(11) Political Rights 2003-2000 IV	(12) Political Rights 2003-2000 IV	(13) P. of Rule Violation 2003 OLS	(14) P. of Rule Violation 2003 OLS	(15) P. of Rule Violation 2003 IV	(16) P. of Rule Violation 2003 IV
Cousin marriage Pref.	-1.63***	-1.50***	**-3.94***	**-4.10***	-3.21***	-3.19***	**-3.27***	**-3.17***	-10.38***	-8.99***	**-25.75***	**-24.56***	-0.68***	-0.20	**-2.42***	**-1.13***
	(0.35)	(0.41)	**(0.57)**	**(0.65)**	(0.43)	(0.69)	**(0.96)**	**(0.86)**	(2.04)	(2.33)	**(3.45)**	**(3.76)**	(0.22)	(0.20)	**(0.46)**	**(0.35)**
Timing Neolithic tr.		-0.08		0.03		-0.17		-0.15		-0.89**		-0.13		-0.03		0.01
		(0.07)		(0.09)		(0.16)		(0.16)		(0.43)		(0.52)		(0.04)		(0.05)
Absolute Latitude		0.58***		0.92***		2.14***		2.40***		4.59***		5.90***		0.32***		0.38***
		(0.21)		(0.25)		(0.75)		(0.90)		(1.02)		(1.22)		(0.09)		(0.08)
UK legal origins		0.62		1.79***		1.66		1.99*		5.30*		11.73***		0.29		0.63**
		(0.51)		(0.55)		(1.12)		(1.08)		(3.06)		(3.24)		(0.27)		(0.27)
France legal origins		0.43		1.54***		1.75**		1.88**		4.65*		10.47***		0.09		0.38
		(0.40)		(0.45)		(0.81)		(0.77)		(2.52)		(2.68)		(0.23)		(0.28)
Ethnic Linguistic Frac.		-1.38*		-0.52						-4.90		1.02		-0.69		-0.32
		(0.80)		(0.99)						(4.63)		(5.65)		(0.44)		(0.45)
GDP per Capita		0.02		-0.01						0.35***		0.17*		0.10***		0.09***
		(0.02)		(0.01)						(0.11)		(0.09)		(0.01)		(0.01)
Constant	5.42***	4.06***	6.23***	2.47**	4.41***	-3.42	4.51***	-4.53	26.25***	11.37**	31.96***	3.78	0.24	-1.49***	0.91***	-1.87***
	(0.19)	(0.92)	(0.18)	(1.21)	(0.39)	(2.74)	(0.40)	(3.20)	(1.30)	(4.86)	(1.33)	(6.36)	(0.17)	(0.41)	(0.19)	(0.44)
N	132	132	117	117	45	45	43	43	136	136	120	120	131	131	115	115
F	21.80	11.68			55.03	15.63			25.95	18.57			9.852	56.02		
Wald -chi2			47.88	120.1			11.72	45.49			55.72	165.5			27.16	365.2
1st stage F-stat of excl. I.			41.13	38.79			13.09	9.983			42.14	40.63			35.41	38.60

Table A.3: Predominant preference for cousin marriage and institutional indicators. Dependent variables are constraint on the executive (average of 2001 to 2010, column 1 to 4; average of 1901 to 1910, column 5 to 8), Government Effectivity in 2010 (column 9 to 12), and the Prevalence of Rule Violations in 2003 (column 13 to 16). The table both reports OLS and IV estimation. Estimates for '%-Cousin Marriage' instrumented with the duration of the Eastern and Western church kin-marriage ban and cousin-terms are displayed in bold. Additional controls are the Timing of the Neolithic Transformation (Putterman, 2008), Absolute Latitude (as used by Acemoglu et al., 2001), UK and French legal origins (La Porta et al., 2008), ethnolinguistic fractionalisation and GDP per capita as used by Ashraf and Galor (2013). Robust standard errors are reported in parenthesis. *p < 0.10, **p < 0.05, ***p < 0.01.

A.4 Cousin marriage and Mafia activity in the Italian provinces

	(1) Mafia Index	(2) Mafia Index	(3) Mafia Index	(4) Mafia Index (North)	(5) Mafia Index (South)
Cousin Marriages	0.858***	0.758***	0.966***	0.909***	0.743***
	(0.157)	(0.231)	(0.299)	(0.211)	(0.257)
South		3.300			
		(3.233)			
Kingdom of Naples			2.390		
(Mainland South)			(3.208)		
Kingdom of Sicily			-6.561		
(Island of Sicily)			(9.025)		
_cons	6.799***	6.592***	5.896***	6.088***	10.204**
	(0.977)	(0.808)	(1.017)	(0.607)	(4.360)
N	87	87	87	57	30
F	30.00	30.80	21.27	18.52	8.320

Table A.4: Ordinary least square estimation of cousin marriage on Mafia activity. Cousin marriages is based on Cavalli-Sforza et al. (2004) and Mafia activity on Calderoni, (2011). In column (1) a dummy variable for Southern Italy is included, in column (2) dummy variables for the area of the former Kingdom of Naples and the Kingdom of Sicily are included, while column (4) only contains Northern and column (5) only Southern Provinces. Robust standard errors are reported in parenthesis. *p < 0.10, **p < 0.05, ***p < 0.01.

Appendix B – Additional Figures

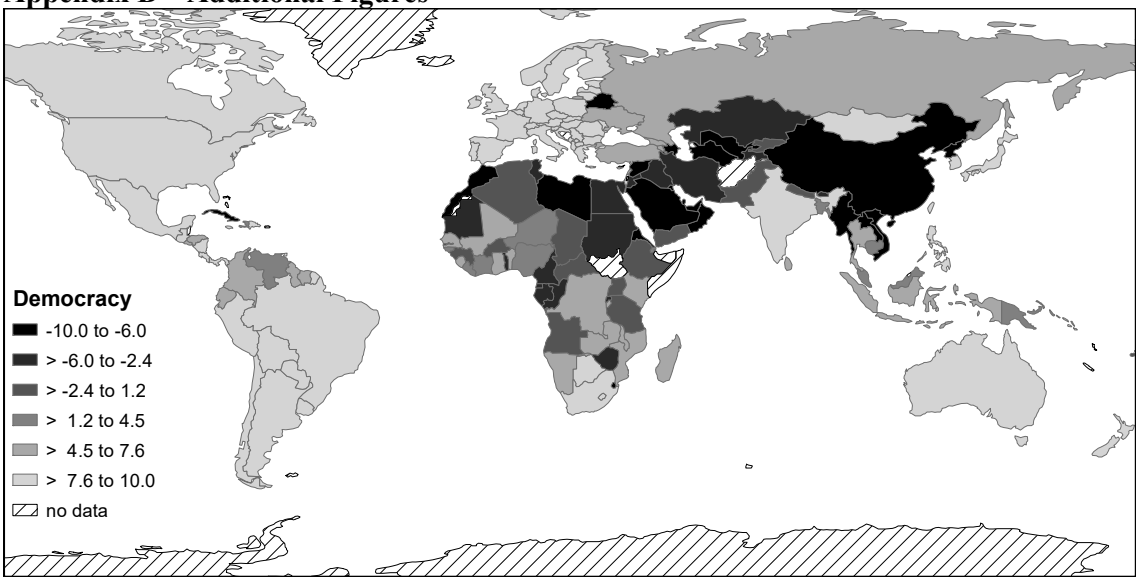


Figure B.1: Index of democracy from the Polity IV (average from 2001 to 2010)

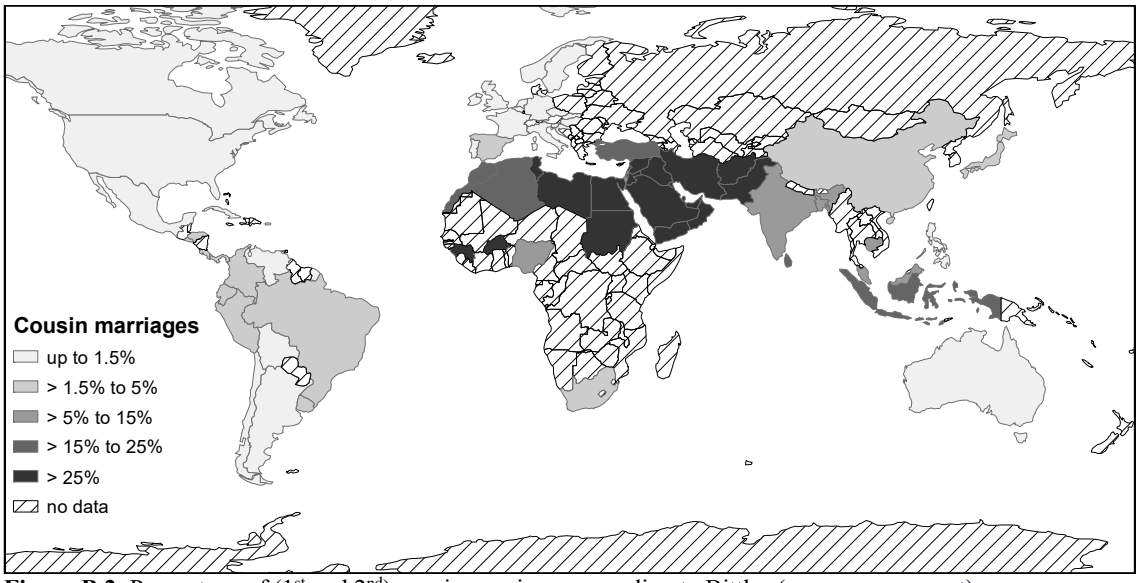


Figure B.2: Percentage of (1st and 2nd) cousin marriages according to Bittles (www.consang.net).

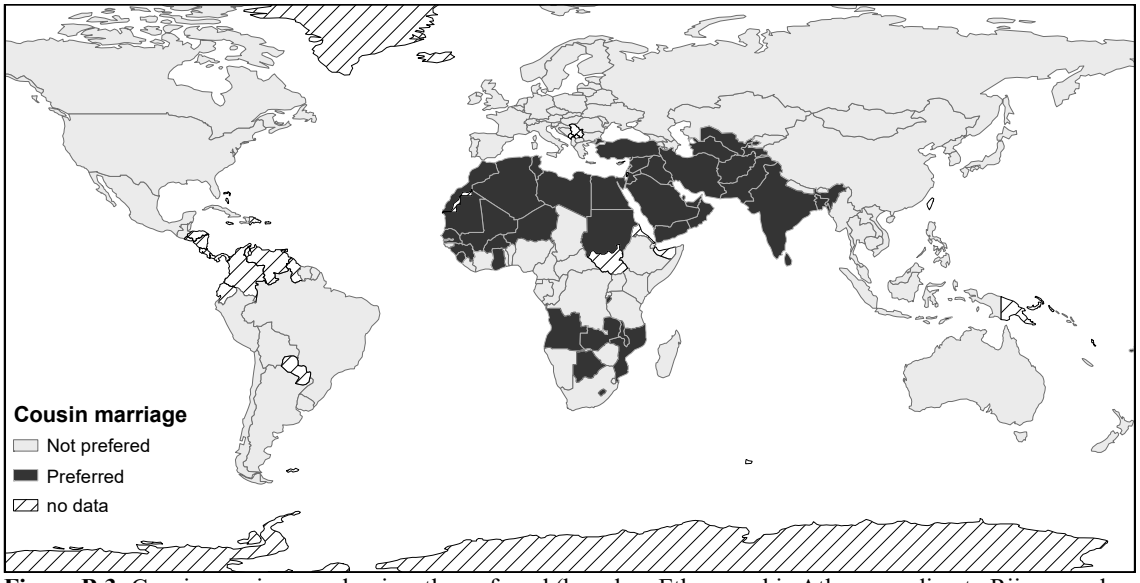


Figure B.3: Cousin marriage predominantly preferred (based on Ethnographic Atlas according to Rijpma and Carmichael, 2013)

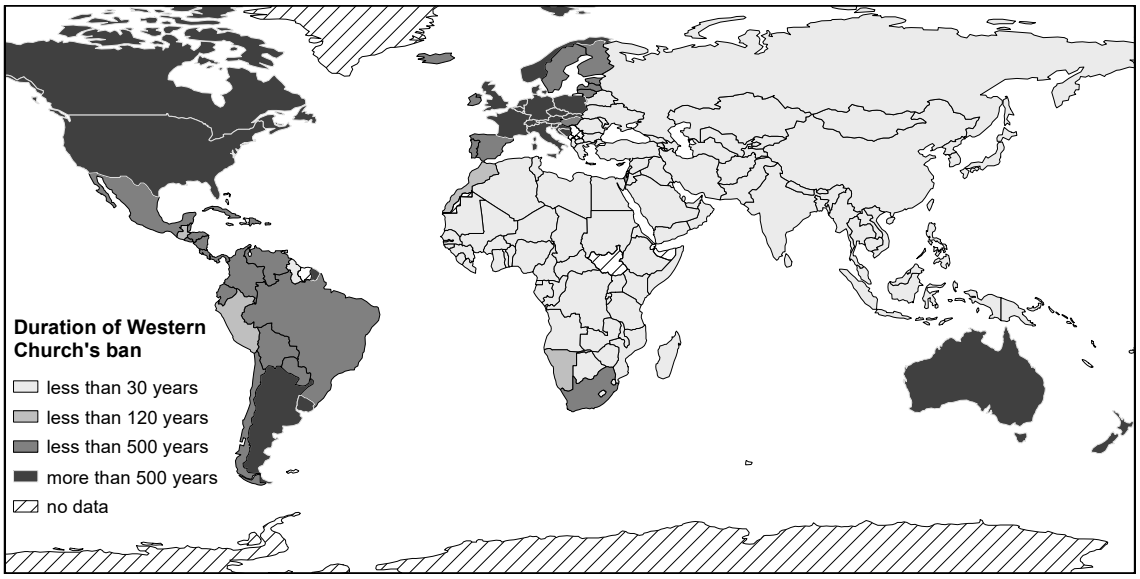


Figure B.4: Kin-marriage ban of the Western Church. Displayed is an ancestor adjusted index revealing the duration of the Western Church's kin-marriage ban an average person's ancestors experienced in a given country (up to the year 1500).



Figure B.5: Kin-marriage ban of the Eastern Church. Displayed is an ancestor adjusted index revealing the duration of the Eastern Church's kin-marriage ban an average person's ancestors experienced in a given country (up to the year 1500).

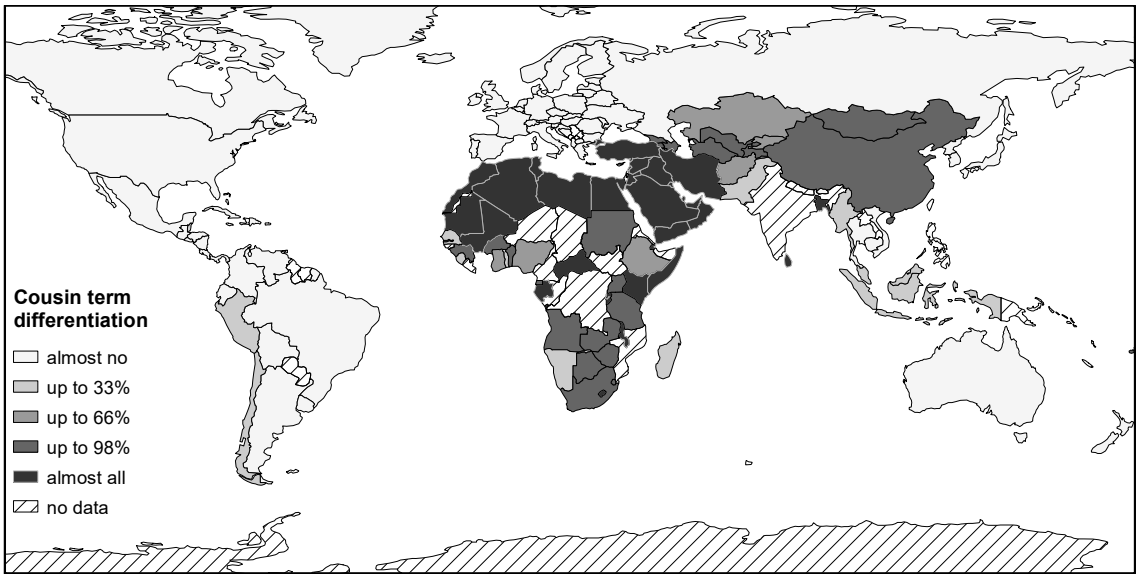


Figure B.6: Cousin term differentiation. The percentage of people speaking a language that differentiates cousin terms (own calculations based on the Ethnographic Atlas as aggregated by Jutta Bolt and Rijpma and Carmichael, 2013).

Appendix C – data sources

Polity Composite Democracy Index - The composite index is the democracy score minus the autocracy score of the Polity IV data set. It ranges from –10 to 10. I used the average of ten years from 2001 to 2010. Where years were missing for a country, the average of the non-missing years was taken.

Percent Cousin Marriage – Based on an extensive literature survey, Bittles (2001) compiled data on cousin marriages around the world (first and second degree). Bittles (at www.consang.net) provides country estimates but cautions to carefully check the underlying source. Where no data was available for the country as a whole from an underlying source, but it existed for sub-regions or sub-ethnicities covering a large proportion of the country, I calculated the country levels based on the population shares in these sub-regions (this was the case for Bangladesh, China, India, Iran, Australia and Israel). If data for the whole country was available from more than one source, I used the average of the sources. I added two countries (Germany and Malta) based on estimates from different sources. The sampling year and the underlying methodology of the data collection varies: some are based on surveys while others

are based on church dispensations. Nevertheless, evidence from countries that have data based on different sources suggest consistency over time and sampling method. Studies comparing Bitles's data to genetic correlates of inbreeding find that both methods paint a consistent picture (Leutenegger et al., 2011, Pemberton and Rosenberg, 2014).

Dummy variable *'Preference for cousin marriage'* – this is an alternative measure for cousin marriages. It is taken from Rijpma and Carmichael (2013) and largely rests on the Ethnographic Atlas. The Ethnographic Atlas is a worldwide ethnicity level data base containing information for 1265 ethnic groups. The data largely reflects information on Ethnicities for the period between 1820 to 1960. It therefore predates my outcome measures by several years. In the Ethnographic Atlas Ethnicities are classified according to whether or not they prefer cousin marriage and what kind of cousin marriage (e.g. cross-cousins vs. parallel cousins) is preferred. The Ethnographic Atlas is missing many large populations in Europe. As a second source and a consistency check Rijpma and Carmichael (2013) used Emanuel Todd's classification to construct this indicator. This indicator has the nice feature that there is an underlying parsimonious coding and the aggregated indicators covers a larger range of countries. However, the measure is coarser as it does not reveal the extent of realized cousin marriage.

Preference for parallel cousin marriage – this dummy variable captures what type of cousin marriage - whether parallel or cross-cousin marriage is preferred. It is likewise based on the Ethnographic Atlas (see above).