Chapter 7
Gender Relations and Economic Development: Hypotheses About the Reversal of Fortune in Eurasia

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Abstract This chapter develops an interrelated set of hypotheses about the links between gender relations, family systems and economic development in Eurasia. First, we briefly discuss a number of ideas from the recent literature about the links between gender relations and economic development. Second, we suggest a measure of historic gender relations via the classification and measurement of historical family systems and offer a set of maps of the institutions concerning marriage, inheritance and family formation that determine the degree of agency that women enjoyed at the micro level. Third, we discuss the possible explanation of the genesis of the Eurasian pattern in family systems and gender relations as a by-product of the spread of agriculture and the process of ancient state formation that followed the Neolithic Revolution 10,000 years ago. Finally, we link these patterns in family systems and female agency to economic growth after 1500. We empirically demonstrate that high female agency and per capita GDP between 1800 and 2000 are related. The 'reversal of fortune' that happened within Eurasia between 1000 and 2000, whereby the ancient centres of state formation and urbanization in the Middle East, India and China were overtaken by regions at the margin of the continent (Western Europe, Japan, Korea), can in our view be linked to this spatial pattern in gender relations and family systems found there.

Keywords Gender relations · Economic development · Eurasia

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7.1   Introduction

This chapter addresses a number of debates in economics and economic history about the determinants of development paths in the world economy in the very long run. These debates have been invigorated by New Institutional Economics (NIE), with its focus on the polity as the 'ultimate' source of 'rules of the game' and on the constraining of power holders by representative institutions as a necessary condition for economic development (e.g. North 1981; Acemoglu and Robinson 2012). In this chapter we suggest that power imbalances at the micro level—between men and women—may be equally important. Our source of inspiration is the work of Amartya Sen (1999) arguing that agency—and in particular female agency—is an important determinant of economic development.

In order to test this hypothesis as an explanation on the 'Great Divergence' or the 'Reversal of Fortune' (or similar big debates in economic history), it is first necessary to quantify female agency in a satisfactory way. Most indices of gender inequality focus on 'outcome' variables—such as the gender wage gap or the share of women in parliament—which change over time and are affected by economic and socio-political developments. In this chapter we suggest an alternative measure, which reflects rules of the game at the household and family level and focuses on the degree of agency women have in the family. We present a dataset of estimates of five different dimensions of the position of women in the family—based on the work of Murdock (1969) and Todd (1985, 1987)—which makes it possible to quantify the degree of 'female agency' at the micro level. These data relate by and large to the situation before industrialization and urbanization, but the spatial patterns that we find probably have very ancient roots. We follow Todd (2011) who argued that the patriarchal family systems of Eurasia were the by-product of ancient state formation following the Neolithic Revolution of some 10,000 years ago. We, moreover, show that for parts of Eurasia, these family systems did not change fundamentally between 1500 and 1900. As a final step, we empirically demonstrate how this measure of female agency affects economic growth in Eurasia in the 1500–2000 period.

This chapter contributes to several debates. It first of all contributes to the debate on the drivers of economic growth in the long run. Our findings suggest that the 'reversal of fortune', which happened in Eurasia between 1500 and 2000, was not only related to colonial institutions (cf. Acemoglu et al. 2002), or to the long-term effects of hierarchical institutions emanating from the process of ancient state formation following the Neolithic Revolution (Olsson and Paik 2013, 2015), but that there is also a gender dimension to this story: growth occurred after 1500 in particular in those parts of Eurasia that had relatively female-friendly institutions. There may be a correlation between balanced gender relations at the micro level and more 'equal' power balances at the level of the state (as suggested, e.g. by Todd 1985, 1987), but we also suggest that there are more direct channels—such as via human capital formation—which link female empowerment and economic change (see the discussion in the next section).

The second, and related, debate to which the paper contributes concerns the origins and persistence of institutions at the family level. There are reasons to believe that the spatial pattern in family systems presented here originated many thousands of years ago. It was, amongst other influences, affected by migration flows, cultural change, economic development and the rise (and decline) of religions, but there was persistent continuity in family structures in spite of these factors. Archaeological and historical evidence suggests that in the core areas of Eurasia, patriarchal family systems appeared relatively shortly after the rise of agriculture and the emergence of highly unequal state hierarchies. We test this hypothesis and find some evidence to support it, but we do not enter into the debate whether this was the result of the use of the plough (Alesina et al. 2013), the rise of agriculture and its distinct division of labour between men and women (Hansen et al. 2015) or the growth of state hierarchies that came later in the process (Olsson and Paik 2013). Our point here is that it is probably not a coincidence that we still find the most patriarchal family systems in regions which were the original centres of the Neolithic Revolution—the Middle East, Northern India and China—a fact that still has many implications for the regions concerned.

The region studied in this chapter is Eurasia. We have explicitly excluded sub-Saharan Africa, the Americas and Australia from the analysis. Ultimately, this is the story of the long-term consequences of the NR, via state formation and changes in gender relations. Africa's history concerning the rise of agriculture is radically different. It did not lead to a similar process of urbanization and state formation (and hence in our view, changing gender relations). Similarly, the probably independent development of agriculture in Papua New Guinea did not have the same long-term impact on society, so we have not included societies to the east of Java in our analysis. Eurasia, in a way, developed as an integrated system, with a distinctive core (from the Levant to the Chinese river deltas) and equally distinctive peripheries. The dynamics of this system (which also includes North Africa) are analysed in this chapter.

Because we are interested in explaining GDP growth after 1500, we have constructed a dataset that adapts the Maddison dataset (see Bolt and Van Zanden 2014). The object of this study is those twentieth-century nation-states for which historical estimates of GDP growth are available. Data on family characteristics have also been added to this dataset, which means that we have made estimates of female agency at the country level for say India or China, knowing very well that underlying such averages lies many regional contrasts.

7.2   Hypotheses Linking Female Agency to Development

There is now a well-established literature in development studies (inspired by the work of Amartya Sen) arguing that female agency is conducive to economic growth and institutional development (Eswaran 2014; Klasen 2002; Klasen and Lamanna 2009; FAO 2011; Teignier and Cuberes, 2014). The World Bank (2011) report

'Gender, Equality and Development' summarizes this literature and contended that strengthening the autonomy of women was 'smart economics'. Agency here is defined as the ability to make decisions and to undertake action in a given environment to achieve a desired outcome. In 2014, a further World Bank report, 'Voice and Agency—Empowering women and girls for shared prosperity', highlighted that although gaps between men and women in many dimensions have narrowed, systematic differences remain, which it ascribes to differences in agency (World Bank 2014/2015).

Gender inequality has consistently been shown to inhibit economic growth and development (Klasen 2002; Klasen and Lamanna 2009; FAO 2011). The idea of women as drivers of economic development has risen to prominence in development studies over the past 20 years, largely as a result of the work of Ester Boserup (1970). The line of reasoning received further support in 1992, from the then chief economist of the World Bank, Lawrence Summers. He argued that in developing countries, investments in the education of girls might just be the highest return type of investment possible (Summers 1992). A number of quantitative studies have built on these ideas to explore the empirical relationship between gender inequality and economic growth and development (Klasen 1999; Teignier and Cuberes 2014). These studies have shown that gender inequality is detrimental to growth. Teignier and Cuberes, for instance, using a model whereby women are inhibited from contributing to the labour force in various ways, find an implied income per capita loss of 27% for Middle Eastern and North African countries and a 10% loss for Europe (Teignier and Cuberes 2014), an economically significant result.

Research has also demonstrated that the effects of gender equality extend beyond economic gain. Improving the position of women has been shown to have positive effects on a wide range of development outcomes: children's educational attainment (Currie and Moretti 2003; King et al. 1986; Schultz 1988; Strauss and Thomas 1995), the quality of government, particularly by reducing corruption (Dollar et al. 2001), reduced infant mortality (Dollar and Gatti 1999; Eswaran 2014), improved household efficiency (King and Hill 1997) and reduced fertility (Rosenzweig and Schultz 1982).

Unfortunately these ideas have not played a significant role in the debate on the long-term developmental trajectories of countries and regions, which has been the focus of much recent research by economists and economic historians. A major source of inspiration for the latter has been the development of New Institutional Economics (NIE), with seminal publications by North (1981), North et al. (2009) and Acemoglu and Robinson (2012). North stresses the importance of rules that constrain the behaviour of those in power. The power of the executive has to be limited to ensure property rights of citizens are upheld and hence create the right incentives to invest. Institutions should, in his view, create a level playing field and guarantee a certain balance of power between ruler and ruled. This basic idea has become highly popular in NIE; it is, for example, at the core of the writings about 'inclusive' versus 'extractive' institutions by Acemoglu and Robinson (2012). Similarly, the introduction of 'rule of law' for elites is considered to be the first step towards an 'open access regime' by North et al. (2009). Many studies have

analysed the importance of democratic institutions for economic development, from the distant past to recent times (Barro 1996; Rodrik 1999; Przeworski et al. 2000).

But NIE is primarily, if not almost exclusively, interested in the constraints on *political* power. Other forms of power—such as 'patriarchy'—have not received the same attention, even though gender inequality may have similar effects in undermining the 'level playing field' of women. Gender inequality seriously limits the agency of approximately half of humankind, who can therefore not work, invest and innovate as they would under free conditions. Patriarchy undermines female property rights and investment incentives in the same way as unconstrained sovereignty may destroy incentives for innovation and investment for (male) entrepreneurs. For instance, the lack of well-defined property rights for women has been highlighted as a substantial barrier to efficient agricultural production in sub-Saharan Africa (see Doepke et al. 2012 for a review).

It follows that we can formulate what we call the *gendered North hypothesis*, arguing that constraints on power holders at the micro level—on the power of the patriarch or the parents—will improve incentives and property rights of women (and young men) and therefore the outcomes of decision-making at that level. A special case of this is related to the switch from investment in 'quantity' to 'quality' of offspring, introduced by Gary Becker and his associates (Becker 1960; Becker and Lewis 1973; Becker and Tomes 1976; see also Schultz 1961). The idea of the quantity-quality trade-off is that parents face constraints in terms of time and money and therefore have to make a choice between the number of children and the amount of time and resources they can invest in them. If they choose to have fewer children, they can increase investment in the human capital of those fewer children. This trade-off is driven by the opportunity cost of child-rearing for women, as they bear most of the costs of having and rearing children. Thus, the higher the level of female education, the larger the costs will be of having more children, in terms of their productivity and the opportunity costs of their time (Becker 1965).[1] The stronger the bargaining position of women in the household, the more these considerations will affect the parental decision-making process. Our *gendered Becker hypothesis* states that increasing the bargaining position of women will further the process of switching from quantity to quality of offspring and enhance levels of human capital formation of the next generation (and in that way stimulate economic growth).

A third hypothesis relates female agency to processes of democratization and development. Emmanuel Todd (1985, 1987) has written extensively about the relationship between family systems and the existence of broad, global differences in (political) institutions and ideologies. The underlying intuition is that children learn how to deal with power in the families in which they are raised, which has important implications for the way in which power, at the level of the polity, will be used or abused. The patriarchal household will teach other values to children than an egalitarian household in which all have a say. Todd's hypothesis helps to explain

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[1]See also Chap. 2 by Diebolt and Perrin.

why certain societies experience, during the process of economic development, a relatively unproblematic change towards democracy, whereas in other parts of the world, this change has been difficult and incomplete.

We will test these ideas in a study of development paths in Eurasia between the Neolithic Revolution and the present. In this chapter we will focus on the link between female agency and economic growth, with the aim of explaining the 'reversal of fortune' that occurred in Eurasia between 1000 and 2000. In his seminal book on the causes and consequences of the Neolithic Revolution, *Guns, Germs, and Steel*, Jared Diamond (1997) discusses the cumulative, self-reinforcing character of technological change. He argues that this is the principal reason why Eurasia, the largest continent with the biggest population, after pioneering the Neolithic Revolution, has dominated technological change since. That it was the first region to move to sedentary agriculture—and hence developed complex societies, cities and states first—and gave the continent a head start over sub-Saharan Africa, the Americas and Australia. In addition, the ease of communication across the continent (due to its east-west orientation)—and finally the cumulative character of technological change explain why Eurasia became the core of the world economy until very recently (and is arguably, with the rise of China, reclaiming this position after a 'temporary' loss to North America).

There is a lot of evidence confirming the path-dependent, cumulative nature of technological and economic change (e.g. Comin et al. 2010). In the year 1000, the core regions of Eurasia corresponded with the 'old' centres of the Neolithic Revolution—the Middle East (then dominated by the flowering of the Arab world), China (under the Sung arguably the most developed part of the world economy) and Northern India (which was in an interlude between the Gupta Empire and the Mogul Empire). Since times immemorial, the economic and urban backbone of Eurasia was the band between the eastern shores of the Mediterranean (including Greece and Egypt) and the great river valleys of China—connecting the three early centres of the Neolithic revolution in the Middle East (Fertile Crescent), the Indus Valley and the Yellow River Valley with long-distance trade (such as the famous Silk Route). Even in 1500—and some would perhaps argue, 1750—this was the basic pattern of the Eurasian economic and urban system.

Until 1000 AD, perhaps 1500 AD, the economic map of Eurasia confirmed Jared Diamond's expectations: based on their head start, the centres of the Neolithic Revolution by and large maintained their leading position. From here on things changed fundamentally: the Industrial Revolution did not originate in Baghdad or Kaifeng, and the first nation to 'catch up' with the leaders was not found near Harappa, the oldest centre of the Indus Valley civilization, but was Japan. It was the periphery of Eurasia—Northwestern Europe and Japan—that pioneered industrialization in the post-1800 period, completely overturning the economic map of the continent. At present, the old core of Eurasia consists of countries with below-average income levels, the exceptions being the oil-producing countries of the Middle East whose progress cannot really be attributed to endogenous advances in technology and institutions (Olsson and Paik 2013, 2015). But the band stretching from Egypt and Turkey in the west to China in the east was, in 1950 (before the 'oil

boom'), and still is, a region of average low levels of GDP per capita, although the recent catch up of China and India is weakening this pattern. As Olsson and Paik (2013) have demonstrated, between 1500 and 2000, a 'reversal of fortune' occurred, during which some of the 'marginal' regions of Eurasia developed very rapidly, whereas the core stagnated. This is a different 'reversal of fortune' from the one made famous by Acemoglu et al. (2002), who analysed the effects of European colonization on global inequality; their focus was on the institutions introduced by European expansion after 1500. We will focus on the institutions that emerged much earlier, in the period of ancient state formation between ca. 3500 BC and 0 AD.

Why did the centre of economic activity of Eurasia move from the central belt between Egypt and China to Western Europe and Japan? We build on the hypothesis developed by Friedrich Engels that the rise of sedentary, complex societies and in particular the 'urban revolution' that began after about 3500 BC resulted in a fundamental change in gender relations. Before the Neolithic Revolution, in hunter-gatherer societies, gender relations were relatively equal, a hypothesis confirmed by recent research (see Hansen et al. 2015 for an overview). The subsequent development of cities, states and hierarchical societies following the Neolithic Revolution resulted in the introduction and spread of more hierarchical family systems, backed up by hierarchical state structures. Those family systems with greater autonomy for women only survived in the margins of Eurasia, at great distances from the original centres of the Neolithic and urban revolutions (Todd 2011). This is a gendered version of the hypothesis developed by Olsson and Paik (2013, 2015), who found a strong negative link between 'years since transition to agriculture and contemporary levels of income'. They attribute this to the long-term impact of hierarchical values and structures arising in ancient societies, which gave rise to autocratic states.

Firstly, we test this hypothesis by quantifying the position of women (or reversely, the level of patriarchy) in the family systems of Eurasia (building on work by Todd and Murdock). This reconstruction of historical family systems confirms Hansen et al. (2015) and Todd (2011) who demonstrated that near the centres of the Neolithic Revolution, family systems emerged which were relatively patriarchal and allowed less agency for women, whereas at greater distance from these centres, family systems (as analysed by nineteenth- and twentieth-century anthropologists) were more 'female friendly'.[2]

Next, we set out to quantitatively explain the 'Little Divergence' (between 1500 and 1800) and the 'Great Divergence' (between 1820 and 1913/1950) by focusing on the link between female agency and economic growth. Because the Eurasian pattern of family systems and female agency emerged thousands of years ago in the wake of the Neolithic Revolution, we can use this pattern as a variable explaining

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[2]We should make explicit here that when we talk about the position of women or female agency, we do not construe these in the way that modern measures of gender equality do (i.e. with data on labour force participation, life expectancy, political empowerment, etc.). Rather we turn to institutional measures which capture the position of women in the ways families organize themselves across Eurasia.

economic growth after 1500, without being too concerned about reverse causality. Our regression analysis demonstrates that there is a strong correlation between female agency and per capita GDP, which suggests a link with post-1500 economic development.

7.3 Measuring Female Agency Within the Family

To consider the link between female agency and economic growth after 1500, we need a proxy for the degree of female agency in the family systems that emerged after the Neolithic Revolution. In a related paper 'Towards an ethnographic understanding of the European Marriage Pattern', Carmichael and van Zanden (2015) used ethnographic information (Murdock's database and Todd's studies) to classify the societies of Eurasia focusing on five institutions that form central building blocks of the family systems of those societies: female inheritance, marital residence (i.e. in proximity to parents of bride or groom or elsewhere), monogamy versus polygamy, endogamy (cousin marriage) and nuclear versus extended households. The point of that paper was to put the European marriage pattern in a wider, Eurasian perspective. In this chapter we analyse both the deep roots of the spatial structure found there and its consequences for economic development.

Each of these five institutions has variants that are more associated with gender equality and/or female agency and those which are less so. Three elements are important for agency: relative power, resources and planning capacity (Kok 2017). The institutions we have chosen were picked to reflect these three elements. To start with *inheritance*, gender egalitarian inheritance between siblings puts brothers and sisters on a more equal footing and is from a gender perspective to be preferred over patrilineal inheritance, in which women are excluded. Egalitarian inheritance also gives women access to resources, an integral part of agency (Agarwal 1997).[3] *Marital residence*—or where the new couple resides—generally takes one of the three forms: patri-, matri- or neolocal. The first two forms (in which the couple lives near the parents of, respectively, the groom or the bride) skew the balance of power in favour of the spouse who remains near their parents. The other spouse is not only bereft of the support of friends and family but must also navigate the hierarchal complexities of living with the family-in-law (Warner et al. 1986). Neolocal residence, where both partners leave the parental nest, creates greater equality. *Monogamy* reflects a system where a single couple is central, whereas polygamous unions, much as they might have positive effects, for instance, through the bonds created between co-wives, appear to be detrimental to gender equality (see Tertilt 2006 and

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[3]Although her actual ability to claim a share of property may depend on various other factors (Agarwal 1997).

Table 7.1 Scoring for the 'female-friendly index'

Variable	Lowest score	Intermediate scores	Highest score
Domestic organization	Extended: 0	Stem: 0.5	Nuclear: 1
Cousin marriage	Endogamy: 0		Exogamy: 1
Monogamy	Polygamy: 0		Monogamy:1
Marital residence	Patrilocal and virilocal: 0	Avunculocal: 0.25 Ambilocal: 0.5 Neolocal: 0.75	Matrilocal: 1
Inheritance	Patrilineal: 0	Daughters less: 0.5	Children equally: 1 Other matrilineal: 1

Notes: Assigning a score to the extended family variable and the endogamy is complicated as in some cases living in extended, endogamous families can be beneficial to women as it keeps their natal kin close-by, which provides them with a support mechanism in times of need. An argument could therefore be made for assigning a half point for the combination of the two; however for simplicity's sake, this has not been implemented here (moreover it has only a marginal effect on the Eurasian distribution). Sources: see text

Bove and Valeggia 2009).[4] Finally preferred *cousin marriage* restricts freedom as to the choice individuals have in determining who their life partner will be.[5] Carmichael (2011), for example, finds that cousin marriage reduces female age at marriage and increases spousal age gaps, indicators which can themselves be used to capture female agency.

To bring the different practices together, we have developed a measure of these family features. In doing so we first of all created a simple index where we assigned scores on all five dimensions (see overview in Table 7.1). This is a transparent way to classify societies as they score on each dimension: societies categorized as monogamous score 1 point here, and societies categorized as polygamous do not score a point. Female inheritance, exogamy, matrilocality and domestic organization all score similar points (see for full details Carmichael and Van Zanden (2015)). As a second step, we applied a factor analysis to explore if the variables all load on a single underlying variable. This gives us a weighting scheme of the five dimensions of female agency that is driven by the data.[6] The factor loadings of each variable are

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[4]For a detailed discussion of how each of these aspects affects the position of women, see Kok (2016) and Carmichael and van Zanden (2015).

[5]Weinreb discusses why marriage between cousins remains an attractive option when the association with birth defects and lowered immunity has become clear. He concludes that one of the mechanisms which is at work is that in situations where women have very little agency, marriage within the kinship group allows them to manipulate family ties, giving them a degree of agency as compared to if they had married outside the group (Weinreb 2008). Leach (1951) describes how in the case of systematically arranged marriages, such as cousin marriages; it is almost always a group of men determining whom should be married to whom rather than individuals choosing their own partners.

[6]We have also performed robustness checks using the simple index of the 'female friendliness' of family systems in Eurasia. The more points a country scores on a scale of 0–5, the more its institutions can be said to favour female agency. Using this simple version of the female-friendliness index gives similar results (available upon request from authors).

Table 7.2 Factor loadings

Variable	Loading
Domestic organization	0.819
Cousin marriage	0.357
Monogamy/polygamy	0.482
Marital residence	0.642
Inheritance	0.440

shown in Table 7.2 below. There appears to be one underlying factor driving the five dimensions of female agency and that they are highly correlated, which suggests that the latent variable represents what all five institutions have in common, that they are a proxy for women's empowerment.

The 'raw' data used for the index is derived from the following sources. Foremost is Murdock's *Ethnographic Atlas* (1969), featured in the journal *Ethnology* from 1962 to 1980 and compiled into a book in 1969. It contains data on 1267 societies for a wide range of characteristics. In each case the data represents the earliest possible observation for each society made by ethnographers (some economists therefore refer to the data as pre-industrial). These were then translated to country-level indicators by Jutta Bolt, using the Atlas Narodov Mira (Bolt 2012) and further reworked by Rijpma and Carmichael (2016). The dataset used here is largely classified by Murdock, with a number of corrections made on the basis of comparing his categorizations to those of Todd (1985, 1987).[7]

The 'female-friendliness' index ranges between −1.11 and 2.43: the more a country's institutions favour female agency, the higher the index. The results of the female-friendliness index (henceforth FFI) are presented in Fig. 7.1, which shows that Europe to the west of the Hajnal line is clearly very 'female friendly', as is Southeast Asia (in Carmichael and Van Zanden (2015), we present qualitative information confirming this pattern). When looking more closely, we find that in the other margins of the Eurasian landmass—in Sri Lanka, Japan, Mongolia and southern India (although it does not show up on the map below, Kerala is a famous case)—marriage systems also allow for female agency. In Europe we find that with the exception of Romania and Greece, the pattern is remarkably similar to the Hajnal line, with Poland, the Czech Republic and Austria displaying an intermediary score and the UK and the Netherlands, along with Italy and Spain, attaining the highest scores.

A somewhat similar 'patriarchy index' was constructed by Gruber and Szoltyzek (2015). They are interested in the same phenomenon, but their focus and methodology are rather different, constructed on the basis of large micro-datasets concerning demographic behaviour, measuring 14 different dimensions (such as 'familial

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[7]These corrections were made because of the relative strengths of both datasets. Murdock's data is the strongest in Africa and parts of Asia, whereas Todd is at his most detailed for Europe. In Rijpma and Carmichael (2016), tests were conducted, and source analysis carried out which resulted in a hybrid dataset for endogamy/exogamy, domestic organization and the equality of inheritance practices (not necessarily by gender).
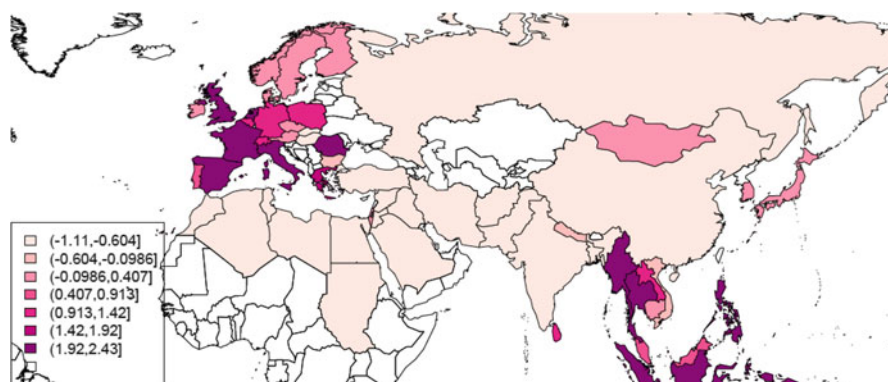
Fig. 7.1 Female-friendliness index mapped for Eurasia. Notes: the darker regions represent more female-friendly family systems using the results of the factor analysis. White means that we do not have data for those regions/countries and/or that these countries are not included in the analysis. Sources: see text

behaviour, including nuptiality and age at marriage, living arrangements, postmarital residence, power relations within domestic groups, the position of the aged, and the sex of the offspring'). Their results, which are however available for only 12 countries and can therefore not be used for the regressions shown below, demonstrate the same west-east gradient in patriarchy as was found in our reconstruction of the FFI. Their results, averaged at the country level, correlate strongly, but obviously negatively, with our index (R2 = 0.53). We also checked the FFI's correlation with current-day measures of gender inequality. For this we use the Historical Gender Equality Index developed by Dilli et al. (2018) and Carmichael et al. (2014). This measure captures gender differences in life expectancy, labour force participation, infant mortality, educational attainment, marriage ages and political participation. Again, our index is correlated with contemporary measures of gender inequality, although the correlation is far from perfect (R2 = 0.33). Sweden, for example, is currently the world leader in gender equality but did not score very well on the FFI. A frequently used index of current values and practices concerning the position of women in society is female labour force participation in 2000. Again, we find a strong positive correlation between our agency variable and this measure of female empowerment (see Fig. 7.2).

Figure 7.2 shows that the outliers (with higher levels of female labour force participation than one might expect given their female-friendliness index score) are all (except China) on the margins of Eurasia. Nepal's position, for example, could be caused by its mountainous geography, which may have isolated it from developments in the rest of Eurasia. Vietnam, Cambodia, Laos, Myanmar and Thailand, however, are on the outskirts of Eurasia, and all exhibit high levels of female labour force participation.
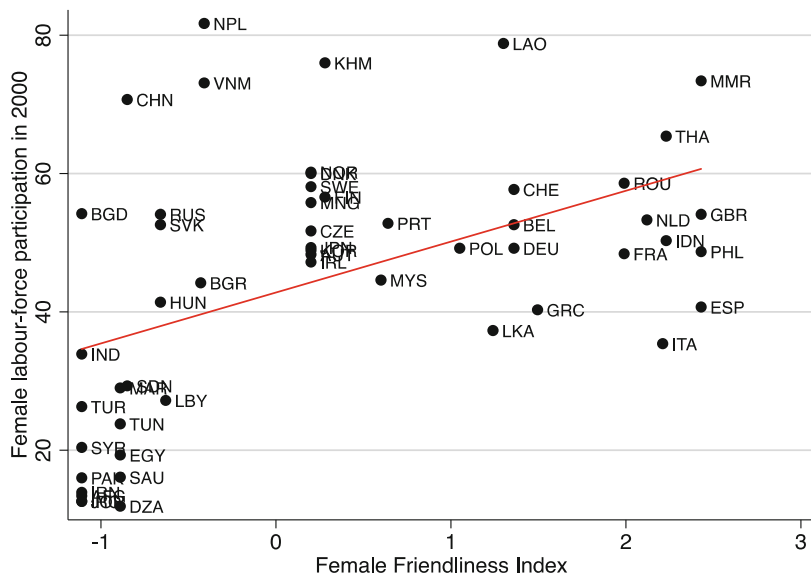
Fig. 7.2 Correlation female-friendliness index and female labour force participation in 2000. Sources: Female labour force participation from Alesina et al. (2013); FFI, see text

7.4 The Evolution of the Eurasian Pattern in Female Agency

Summing up, our measure of female agency within the family, which is based on data used by Murdock and Todd reflecting the situation in the societies involved before the dramatic changes of the late nineteenth and twentieth century, correlates strongly with contemporary measures of female agency. This suggests that such patterns persist over time. In this section, we argue that these patterns are extremely old, probably stemming from the period following the Neolithic Revolution 10,000 years ago. We do this in two steps. We first of all scan the literature about family systems and female agency around 1500, to see whether we find similar patterns at that time. As a second step, we will discuss the link between the genesis and spread of the Neolithic Revolution and the spatial distribution of family structures.

What do we know about these patterns at about 1500? For Europe, Fig. 7.1 is in line with results of research into the origins of the European marriage pattern, which, as has been demonstrated elsewhere, emerged in the Late Middle Ages (see discussion in De Moor and van Zanden 2010). This was a marriage system in which women had—comparatively—high agency: marriage was based on consensus, in which the bride had to agree to the nuptials as much as the bridegroom (and the parents). Importantly, the EMP had deeper historical roots. In the discussion among theologians in the twelfth and thirteenth centuries about the basis of marriage, it was noticed that the northern parts of Europe preferred 'consensus', whereas in the south,

this was much less likely to be the case (De Moor and Van Zanden 2010). It was truly in the margins of Eurasia—in Northwestern Europe and not in the Mediterranean—that the EMP emerged. Anecdotal evidence also shows that the marriage customs of the Franks who came to the Holy Land during the Crusades were quite different from those of the local—often Muslim—population. The latter wondered about the free interaction between Frankish men and women and the independent position women had in Frankish society, suggesting major differences between Western Europe and the Middle East already during the High Middle Ages (Lewis 1982, pp. 285–7). The debate about the historical evolution of the position of women in the Middle East mainly focuses on the question of whether their disadvantaged position was due to the rise of Islam or rooted in older traditions. Certain traditions that became general after the conquest by Islam—such as veiling and the seclusion of women in separate spaces, linked to emphasis on family honour—did exist before Mohammed but became much more general after the consolidation of Islam as the dominant religion (Keddie 2012). This in spite of the fact that the initial preaching by Mohammed may have been quite favourable for women, and they (e.g. his favourite spouse Aisha) played a relatively prominent role during the first stages of the movement. The debate about the origins of 'female-unfriendly' institutions in the Arab world however does show the deep roots of the institutions that we still witness today—in many respects going back to the period (long) before Mohammed.

Moving further east, Japan, before 1500, was hardly affected by the processes of state formation and hierarchization that had occurred on the mainland. The first Chinese reports about the island mentioned that it was quite uncivilized as men and women were considered equal (Silva-Grondin 2010). Strikingly there are suggestions that Japan before (and during) the Kamakura period (1185–1392) should be considered a matriarchal society (Lebra et al. 1976). This gradually changed after the fourteenth century, but even during the Tokugawa period, women had a relatively strong position in the family and were even allowed to deny marriage if they were willing to remain with their parents to take care of them (Sugano 2003, pp. 187–188).

It therefore seems that we find confirmation of the exceptional position of women at both ends of the continent. Another way to answer the question when and why this spatial pattern in gender inequality in Eurasia appeared is via historical and archaeological research that documents the decline of the position of women in ancient societies. Wright (2007), in a recent analysis of the evolution of gender relations in the first urban societies in Mesopotamia between 6000 and 2000 BC, confirmed the hypothesis that it was the growth of urban society in the late Fourth Millennium that gave rise to patriarchal systems and that the status of women declined during the corresponding process of state formation. A recent comparative analysis of ancient civilizations summarized the evidence about inequality as follows:

> In early civilizations. . .inequality was regarded as a normal condition and injustice as a personal misfortune. . .. Structures based on differential power were pervasive. Every child was born into and socialized by a family that was internally hierarchized in the image of the state. The subordination of children to their parents and, to varying degrees, of wives to their husbands went unquestioned. . .. Young people were expected to obey older people,

especially older men. 'Father', 'king', and 'god' were often synonymous and metaphors for power. . .. If egalitarian social organization was known to people in early civilizations, it was a feature of small-scale and usually despised societies beyond the pale. (Trigger 2003, pp. 142)

Both studies indicate that urbanization and state formation had dramatic consequences for the position of women. This is part of a more general discussion about the long-term consequences of the Neolithic Revolution. The literature suggests three ways in which this may have been the case, given the relatively equal gender relations in hunter-gather societies.[8] The spread of agriculture likely resulted in a fundamental change in the division of labour between the sexes—men specializing in the production of food and women in reproductive activities (Hansen et al. 2015). Moreover, as Boserup (1970) has argued, the spread of the plough gave rise to further specialization between men and women, which resulted in growing inequality between the sexes. This hypothesis has been extensively tested by Alesina et al. (2013), who found strong correlations between early adoption of the plough and contemporary attitudes towards women and in particular their labour force participation. The second way in which the Neolithic Revolution affected the position of women was via the emergence of complex forms of social inequality in the cities and states that followed its spread, which had a profound effect on the position of women (see the quote from Trigger 2003). A last mechanism by which the two may be linked is through the process of pushing out individuals or groups whose ideology no longer matched that of the newly formed states. This means, in the case of the Neolithic Revolution, that the more individualistic individuals who were less accepting authoritarian structures leave the centres to take up residence in the margins (Olsson and Paik 2015).

The idea that the original form of family organization was female friendly and was replaced by a more male-oriented version with the rise of private property harks back to the work of Lewis H. Morgan and Friedrich Engels (Morgan 1877/2013 and Engels 1884/2010). More recent work by the anthropologist Emmanuel Todd (2011), in his analysis of the development of family systems in Eurasia in the very long run, has substantiated this line of thinking further. He pointed to the geographical concentration of patriarchal family systems in the heartlands of the continent and the existence of more female-friendly family systems in its margins—in Western Europe, Sri Lanka, Japan, Mongolia and Southeast Asia. Todd maintained that early states developed patrilineal hierarchies, fundamentally changing the original balance of power between men and women which predominated in the nuclear family of the earlier hunter-gatherers. The patrilineal, community family organization type lent itself well to empires based on conquest; therefore early state formation (following the Neolithic Revolution) resulted in family systems that constrained female agency.

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[8]Dyble et al. (2015) analyse sex equality among hunter-gatherers as an adaptive strategy to maximize cooperation and see this as a 'shift from hierarchical male philopatry typical of chimpanzees and bonobos'.
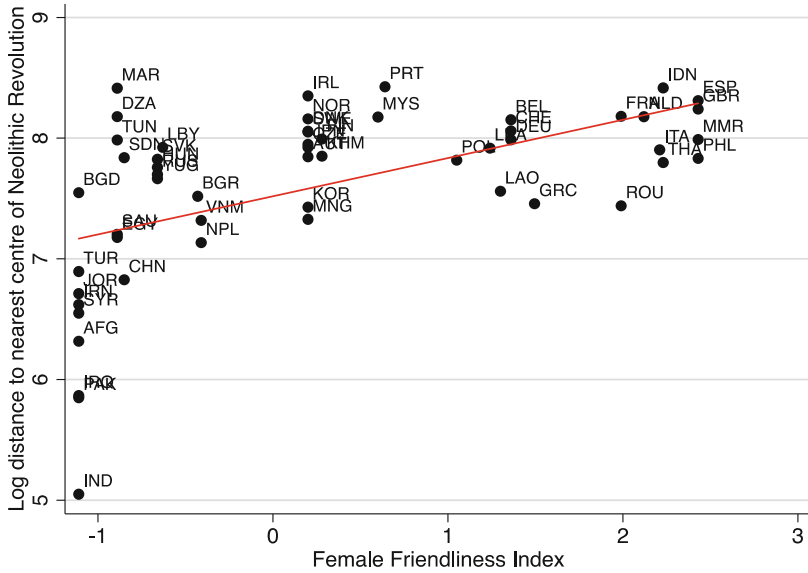
Fig. 7.3 Correlation female-friendliness index and distance to nearest centre of the Neolithic Revolution. Sources: see text

Only in the margins of Eurasia, at great distance from the centres of the Neolithic Revolution, did female-friendly family systems survive.

A similar analysis of the spatial structure in contemporary value systems was offered by Olsson and Paik (2013; 2015), who found a strong negative link between 'years since transition to agriculture and contemporary levels of income'. They attribute this link to the long-term impact of hierarchical values and structures arising in ancient societies, which gave rise to autocratic states. In short, the historical and archaeological literature and the anthropological evidence suggest that there is a link between the Neolithic Revolution, the subsequent process of ancient state formation and the emergence of family systems that suppressed female agency.

We propose two ways to test these hypotheses about the genesis of the Eurasian pattern of female agency (see also Hansen et al. 2015). First, we established the distance of (the capital cities of) all countries to the three centres of the Neolithic Revolution; in the Middle East, the Indus Valley and the Yellow River valley in China. On the basis of secondary literature, we selected three cities to geographically represent the transition to agriculture in these three regions: Mosul in Iraq, Harappa in Pakistan and Xian in China. We hypothesized that the farther away a country was from the nearest centre, the more female friendly the family system would be. This is clearly demonstrated by the evidence of the 55 countries for which we have data (see Fig. 7.3).

Although the correlation is far from perfect, it can be observed that the countries scoring the lowest on the FFI are all within 1000 km of the nearest centre of the Neolithic Revolution. Another mechanism, as mentioned above, which links the
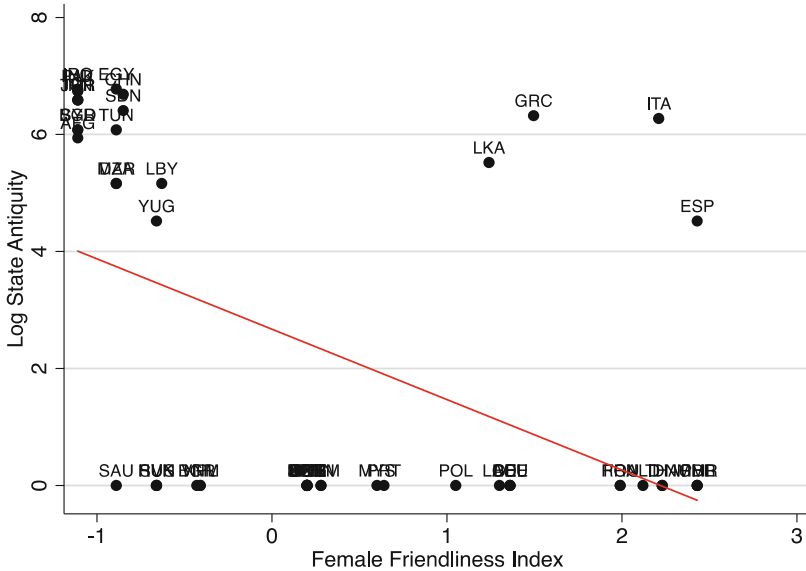
Fig. 7.4 Correlation female-friendliness index and state antiquity. Sources: state antiquity index, see text and Footnote 8; FFI, see text

Neolithic Revolution and the current FFI, is ancient state formation with its emphasis on hierarchical structures. Therefore Fig. 7.4 plots the FFI against a measure of state antiquity.[9] Here we see an equally strong relationship. Younger states are associated with higher scores on the factor analysis variable, suggesting more egalitarian attitudes towards gender at the household level.

A final test of the Neolithic roots of the Eurasian map of family systems is to estimate the following regression equation:

[9]This index measures state formation between the Neolithic Revolution and AD1. It is well known that these ancient states first emerged in Mesopotamia, followed by Egypt, Northern India and Northern China and then gradually spread to adjacent areas. The 'World History Atlas and Timelines since 3000 BC' by GeaCron presents maps per century of the changing boundaries of these ancient states. We reconstructed for each contemporary country if an ancient state existed on its territory between 3000 and AD1 and on that basis constructed an 'ancient state index' using the same method as the 'state antiquity index' by Putterman and Bockstette (3.1 version), which covers the 1–1950 AD period (http://devecondata.blogspot.nl/2007/03/state-antiquity-index.html and http://www.brown.edu/Departments/Economics/Faculty/Louis_Putterman/antiquity%20index. htm). All countries are scored per century (and before 1500 BC per half millennium) on the existence of a state, and these scores are added using a discount rate of 10% per century. States with old roots, such as Iraq, Egypt, India/Pakistan and China, score (nearly) the maximum, whereas regions such as Scandinavia, Southeast Asia and Japan, where states emerged or spread to after 1 AD, score zero.

$$F_i = \alpha + \gamma_1 Z_i + NR_i \beta_1 + SA_i \beta_2 + \varepsilon_i, \tag{7.1}$$

where F_i denotes our female-friendliness index for country i and NR_i and SA_i estimate the effect, respectively, of the log of the distance to the Neolithic Revolution and the log of state antiquity on female agency. Z_i is a vector of control variables, and ε_i is the error term. The countries included in our sample are weighted according to their population size. This means that China has a greater impact on the results than Belgium.

Table 7.3 shows a strong relationship between the distance to the nearest centre of the Neolithic Revolution and female agency (Column (1)). Similarly, there is also a strong negative association between our FFI and ancient state formation. To control for confounding factors, we first of all capture the geographical characteristics of the countries in our sample, which could be relevant for the development of agriculture and therefore for female agency. These measures include absolute latitude (measured as distance from the equator) and the percentage fertile soil (defined as soil which does not have extreme constraints for growing rainfed crops in terms of soil fertility, depth, chemical and drainage properties or moisture storage capacity (see Nunn and Puga (2012)). To control for any effect stemming from ethnic fractionalization, which may have negatively impacted gender relations, we include ELF1 in the regressions (Desmet et al. 2012). This variable captures the differences in language and ethnicity of the population living in a country. We also experimented with other versions of this variable, but the results were almost identical. Column (2) of Table 7.3 however illustrates that the regression results are robust, even when controlling for these factors.

Table 7.3 Explaining female agency in Eurasia

	(1)	(2)
	Dep. var. is FFI	
Log distance NR	0.360**	0.537**
	(2.20)	(2.56)
Log state antiquity	−0.202***	−0.133*
	(−2.95)	(−1.95)
Latitude		−0.0183**
		(−2.44)
Fertile soil		0.0202***
		(2.88)
Ethnic fractionalization		−0.37
		(−0.39)
Constant	−1.789	−3.413*
	(−1.33)	(−1.78)
r2	0.609	0.733
N	53	53

Notes: t-statistics in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively. Robust standard errors to control for serial correlation in the unobservables

We have now established that the Eurasian map of female agency based on ethnographic data from Murdock and Todd, for the period before industrialization, is correlated with different variables which reflect the beginnings and spread of the Neolithic revolution and the process of state formation between about 8000 BC and 1 AD. This is a remarkable result: it appears that the underlying values and norms are highly persistent over time and were able to remain more or less intact (spatially) during the past two millennia. However, similar persistence has been observed in related literature: Alesina et al. (2013) and Hansen et al. (2015) found similar 'deep roots' of gender roles, and Olsson and Paik (2013, 2015) found a comparable link between hierarchical value systems emerging after the Neolithic Revolution and current beliefs. The fact that these spatial patterns predate, by a large margin, the emergence of the 'modern economic growth' that we are interested in negates problems related to reverse causality: economic growth after 1500 has not fundamentally changed the pattern of female agency that we reconstructed on the basis of the anthropological evidence.

7.5   Explaining the Reversal of Fortune

We have so far shown that a distinctive spatial pattern of institutions concerning the family and gender relations emerged in Eurasia, seemingly as a by-product of the Neolithic Revolution and the ensuing state formation. Our main hypothesis in this section is that this spatial variation in gender-related institutions had important consequences for the pattern of economic growth after 1500 AD and that it helps to explain the reversal of fortune that is a dominant feature of growth between 1500 and 2000.

We relate the FFI to estimates of per capita GDP to explore whether it helps to explain the reversal of fortune between 1500 and 2000. In doing so, we regress the FFI on per capita GDP of each country in our sample at different points in time (1500, 1800, 1870, 1910, 1950 and 2000):

$$\text{Ln } Y_{it} = \alpha + \gamma_1 \, Z_i + F_i \, \beta + \varepsilon_{i,} \tag{7.2}$$

where $\text{Ln } Y_{it}$ denotes the log of per capita GDP in country i in year t, F_i again is the female-friendliness index of country i, Z_{it} is the same vector of control variables that we introduced in the previous section and ε_i is the error term. We test this hypothesis empirically using linear regression analyses (OLS).

Estimates of GDP per capita are from Maddison (2001) and the recent update of his dataset by Bolt and Van Zanden (2014). For 1500, this dataset includes new data on GDP per capita in China, Japan, Ottoman Empire, India (first available estimate for 1600, used as a proxy for 1500 in the regressions here), Poland, Sweden, Spain and other European countries. For 1500 and (to a lesser extent) 1800, the dataset is still somewhat biased towards Europe, in spite of the new research done on the rest of Eurasia. As a robustness check, we therefore estimated the model given in

(2) including only those countries for which we have GDP data in 1500. The regression results do not deviate from the ones reported in the current section (available upon request).

As an additional set of control variables, we include both the log of distance to the nearest centre of the Neolithic Revolution and the log of the state antiquity index, as both are strongly related to female agency (see Table 7.3). For the regressions explaining differences in per capita GDP in 2000, we have also included a dummy for oil to control for the possibility that oil-producing countries experienced a different trajectory of economic development after the Second World War. It may also be correlated with our FFI, as oil-producing countries are generally characterized by less female agency.

Table 7.4 presents the regression results, where again countries are weighted by population. They show a consistent positive relationship between female-friendly family organization and the level of GDP between 1820 and 1950. No such link exists in 1500, when GDP per capita in Western Europe was not or only marginally higher than in the Arab world or China. The coefficient of the FFI is still positive in 2000, but not significant anymore, which is probably related to the 'Asian miracle' and the rise of oil-producing countries (paradoxically, we find a negative oil dummy). These regressions appear to confirm the hypothesis that growth between 1500 and 1950 was positively related to the degree of female agency in family systems of Eurasia.

7.6   Conclusion

The aim of this chapter was to discuss the hypothesis that female agency as rooted in family systems had beneficial effects on long-term economic growth. More specifically, we formulated and tested the *gendered North hypothesis*, which holds that constraints on powerholders (men, parents) at the micro level improved incentives and property rights of women and in that way contributed to the outcomes of decision-making at that level. This in turn is argued to have had a positive impact on per capita GDP levels during the period of the reversal of fortune in Eurasia when Western Europe and Japan pulled ahead of the rest of Eurasia. We have furthermore argued that the degree of agency of women at the micro level in pre-industrial countries was the result of differential changes in family systems going back to the Neolithic Revolution and the rise of cities and state hierarchies following in its wake. The more peripheral countries and regions were, vis-á-vis the first centres of the Neolithic Revolution, and the process of ancient state formation that occurred near those centres, the more dynamic regions in the post-1500 period.

This chapter also sheds new light on the character of long-term economic development in Eurasia. We distinguish two different phases of development. The first is the process of 'ancient' economic and political development, and the second is the stage of 'modern' economic and institutional growth. During the first stage, which was concentrated in and near the centres of the Neolithic Revolution,

Table 7.4 Explaining the reversal of fortune

	(1)	(2)	(3)	(4)	(5)	(6)
	1500	1820	1870	1910	1950	2000
	Dep. var. is the log of per capita GDP					
FFI	0.11	0.199***	0.232***	0.217***	0.188**	0.263
	(1.33)	(3.98)	(3.88)	(3.35)	(2.01)	(1.57)
Latitude	0.0246**	0.0162***	0.0224***	0.0235***	0.0332***	0.0386***
	(2.53)	(5.21)	(7.19)	(8.12)	(10.68)	(5.63)
Fertile soil	−0.00443	0.00293	0.00709**	0.0107***	0.0100**	−0.000135
	(−0.78)	(1.32)	(2.65)	(3.04)	(2.11)	(−0.02)
Log distance NR	0.0448	0.00353	0.0379	0.0627	0.217	0.239
	(0.21)	(0.05)	(0.40)	(0.54)	(1.34)	(1.35)
Log state antiquity	0.0818**	0.0407*	0.0163	−0.0271	−0.0596	−0.0155
	(2.84)	(1.82)	(0.75)	(−1.11)	(−1.58)	(−0.27)
Ethnic fractionalization	0.306	0.378	0.526	0.805	1.872**	1.209
	(0.22)	(0.96)	(0.97)	(1.21)	(2.05)	(1.12)
Oil dummy						−0.715*
						(−1.69)
Constant	5.363***	5.602***	5.140***	5.220***	3.883***	5.361***
	(3.27)	(8.95)	(6.26)	(5.12)	(2.74)	(3.79)
r2	0.696	0.721	0.826	0.838	0.813	0.665
N	25	42	46	46	52	52

Notes: *t*-values in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively. Standard errors are adjusted to control for serial correlation in the unobservables

development resulted in—co-evolved with—the creation of hierarchical structures, both at the level of the state and at the micro level. Development and inequality went hand in hand. The Eurasian economy as a result was, until approximately 1500, characterized by a large band of (strong) states, high levels of urbanization and relatively intense international trade stretching from the Mediterranean to the Yangtze Delta. This created the spatial structure of family systems and gender relations we mapped in this chapter.

Growth after 1500 was fundamentally different from growth before 1500: it started and was most intense in the margins of the Eurasian continent, in regions with relatively low levels of patriarchy: in Western Europe and Japan. Growth after 1500 was not based on the creation of large hierarchical structures subjugating the working population, on 'extractive institutions', but on 'bottom-up' processes of market participation and investment in human capital (by households), which required radically different, inclusive institutions. The margins of Eurasia, where the embedding of hierarchical societal structures of the previous millennia had not occurred, were much better placed for this second stage of growth. Here we find the most intense forms of pre-industrial growth (in the North Sea area), followed by the Industrial Revolution and the 'Great Divergence'. Our explanation for this 'reversal of fortune' is a combination of the gendered North hypothesis and the gendered Becker hypothesis, but at this point, we can only demonstrate that female-friendly institutions mattered for long-term economic success in Eurasia after 1500. Which mechanisms translated female agency into growth cannot be shown yet on the basis of the analysis presented here.

Our analysis also points to persistent regional differences in family systems and gender relations in Eurasia and argues that their roots are to be sought in the differential impact of the first stages of economic development. Moreover, the persistence of these institutions in the heartland of Eurasia probably hindered its economic modernization in the long run. We however do not offer a satisfactory explanation for the persistence of these gender-related institutions during this very long time period. There may have been an interaction with religion, as religions with specific family values concentrated in certain areas (a factor that we also do not consider in this chapter). Islam, for example, now and in the past by and large, coincides with regions with high gender inequality, whereas Christianity and Buddhism correlate with more 'female-friendly' family systems. This perhaps suggests a certain co-evolution between religious- and family-related values, which may have reinforced and stabilized these systems of values and norms. But it is beyond the scope of this chapter to deal with the issue of persistence in more detail (see the discussion in Kok 2017). The reversal of fortune within Eurasia is in the end explained by this interplay of geographic and institutional factors. Some of these, such as distance to the centres of the Neolithic Revolution, the institutions that emerged in the core area and in the margins of the continent, have been elucidated here, but how exactly they interact remains to be explored.

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