ATTITUDES, POLICIES, AND WORK

Francesco Giavazzi
IGIER-Universita' Bocconi

Fabio Schiantarelli
Boston College

Michel Serafinelli
University of Toronto

Abstract

We study whether cultural attitudes towards gender, the young, and leisure are significant determinants of the employment rates of women and of the young, and of hours worked. We do this controlling for policies, institutions and other structural characteristics of the economy which may influence labor market outcomes. We identify the effect of culture exploiting the evolution over time within country, as well as across countries, of cultural attitudes. We also address the endogeneity of attitudes, policies, and institutions, and allow for the persistent nature of labor market outcomes. We find that culture matters for women's employment rates and for hours worked. However, policies, in particular employment protection legislation and taxes, are also important and their quantitative impact substantial. (JEL: J16, J22, J23, Z1)

1. Introduction and motivation

To what extent does 'culture' affect labor market outcomes? For instance, it has been claimed that cultural attitudes towards gender and the young are important determinants of the substantial cross-country and time series differences in the employment rates for women and youth in OECD countries (see for instance Algan and Cahuc 2007; Fortin 2005). In this vein, Alesina, Glaeser, and Sacerdote (2005) have asked whether culture could explain the observed difference in hours worked between Europe and the United States, Stutzer and Lalive (2004) have studied the effect of social norms

---

regarding work on the duration of unemployment in Switzerland, while Fortin (2009) has analyzed the effect of culture on an individual's decision to join the labor market in the United States.

However, the evidence on the role of culture as a determinant of cross-country differences in labor market outcomes has so far been inconclusive, mainly for three reasons. First, as noted by Alesina, Glaeser, and Sacerdote (2005), the papers on this topic often fail to allow for other factors that may determine labor market outcomes, in particular the differences across countries and the evolution within a country of economic structure (for instance the share of the services sector) and, importantly, of labor market policies and institutions. Second, these analyses rarely recognize that the variables used to capture a country's culture are typically endogenous: attitudes towards leisure and work, for instance, are likely to be affected by the aggregate state of the labor market. Finally, these papers seldom allow for the fact that employment rates and hours of work evolve gradually over time.

Our aim is to investigate whether culture plays a statistically and economically significant role for labor market outcomes when one tries to take care of the endogeneity of workers' attitudes, to allow for the persistent nature of labor market outcomes, and to control for a large menu of policies and institutions, recognizing—as is the case of attitudes—that some of these variables are also likely to be endogenous. The investigation of the effects of workers' attitudes on labor market outcomes (our focus is on the employment rate of women and the young and on the average number of hours worked) is part of a more general research program aimed at assessing the effect of culture on economic phenomena. In their excellent survey of this literature Guiso, Sapienza, and Zingales (2006) define culture as "those customary beliefs and values that ethnic, religious and social groups transmit fairly unchanged from generation to generation". This definition highlights the difficulties in identifying a country-specific effect of culture. If culture is a time-invariant characteristic of a country it is very difficult to identify its causal influence on economic outcomes separately from the effect of other country-specific constant characteristics.[1]

In this paper we address this issue by exploiting the variation within countries, as well as across countries, of cultural attitudes, policies and institutions. The use of panel data information allows us to identify the role of culture, policies, and institutions in determining a country's labor market outcomes, using their time-varying component and controlling for time-invariant country characteristics. This approach is obviously informative only to the extent that cultural attitudes, in addition to policies and institutions, have a significant time-varying component that differs across countries. This is definitely the case, for instance, with the set of attitudes towards the role of women in the family and in the workplace—a potentially important cultural determinant of women's employment outcomes: over the last quarter century, these particular attitudes have changed substantially and in a way that varies from one

---

1. In a cross-sectional context, the basic problem resides in the questionable assumption of orthogonality between the culture variable (or the instruments used for it) and the error term in the equation of interest, since one cannot control in a cross-section for time-invariant unobservables.

country to another, reflecting, among other factors, different ways in which innovations in reproductive technology or home production technology propagate, changes in the general level of education, broader changes in attitudes towards religion, and evolving local labor market conditions. The same is true for attitudes towards desirable characteristics of the young, such as independence, and towards the value of leisure, a possible determinant of hours worked.

In order to obtain a measure of attitudes towards women's work and towards youth independence, and assess their effect on the employment rate of women and the young, we use the World Values Survey (WVS). We also analyze the importance of attitudes towards holidays (also reported in the WVS) for average hours worked, a topic not investigated so far in the literature. Although the WVS has well known limitations, it has the advantage of being available for multiple waves over a long time period, thus providing potentially time-varying measures of cultural attitudes. For a set of OECD countries time-varying measures for such attitudes are available at (approximately) equally spaced intervals of ten years from the beginning of the 1980s to the beginning of the 21st century.

As we have already mentioned, a country's attitudes cannot be assumed to be exogenous. Attitudes towards women, or the young, or towards leisure are likely to be affected by present and past individual and aggregate labor market outcomes (in addition to policies and institutions). For instance, high employment rates for women may reinforce the sense that having a role in the formal labor market is both rewarding and acceptable, and may lessen the perception of motherhood as a necessary component of fulfilment. Moreover, during an economic expansion hours worked typically increase: longer hours could affect attitudes towards the desirability of long holidays (the variable we use to measure attitudes towards leisure) in two opposite directions. People could get used to working longer hours and think that long holidays are less important, or they could be tired and desire longer holidays. In both cases attitudes towards leisure will change as a result of the specific labor market experience. In the dynamic panel estimation framework proposed by Arellano and Bond (1991) and Blundell and Bond (1998), appropriately lagged values of attitudes and outcomes can be used as instruments, reflecting the idea that attitudes tend to be persistent and that they evolve in response to shocks to labor market outcomes. The GMM framework also allows us to obtain consistent estimates when labor market outcomes themselves have a degree of persistence over time, thus requiring the estimation of dynamic models for employment or hours.

Besides availing ourselves of these internal instruments, we extend the set of instruments using 'deeper' attitudes that evolve over time, such as religious beliefs, as additional instruments. Our assumption is that the evolution over time of religious beliefs is correlated with the evolution over time of those attitudes that are more directly relevant for labor market outcomes. However, contrary to those attitudes, religious beliefs (i) are not (contemporaneously) affected by labor market outcomes and (ii) are likely to affect outcomes only through such attitudes, once we control for other time-varying policies, institutions, and structural variables. Under these assumptions deeper attitudes can be treated as predetermined variables in the GMM framework

we adopt, and their lagged values used as instruments. As we shall discuss, religious beliefs may signal more conservative values, among them the idea that women should be subordinated to men and naturally belong to the home in some countries, but not in others. For this reason we will interact measures of religious beliefs with a country's prevalent historical religious affiliation (Catholic, Protestant, and other (Japan)).

We further extend our set of instruments by including the attitudes of second or higher generation American immigrants from different countries at different points in time. The basic idea is that the evolution over time of the attitudes of American immigrants is correlated with that of attitudes in the country of origin: this could be due to the fact that shocks that hit both the United States and the country of origin, are filtered by a person's culture in a way that persists across generations. These attitudes, however, can be assumed to be exogenous because they respond to institutional and economic shocks in the United States but are unlikely to be correlated, under certain assumptions, with economic shocks in the country of origin.[2]

The endogeneity of cultural traits is one of the central issues in this literature and we are not the first to address it. For instance, Alesina and Giuliano (2010) use a variable based on the grammatical rule of pronoun drop as an instrument for a particular cultural trait: family ties. Guiso, Sapienza, and Zingales (2006) use the percentage of adherents to various religious denominations as an instrument for thrift, a cultural trait supposed to affect aggregate saving. Licht, Goldschmidt, and Schwartz (2007) and Tabellini (2008a) investigate the role of culture in determining the quality of institutions, and also use a linguistic variable as an instrument for culture.[3] These papers are mostly cross-sectional in nature. Even if repeated observations over time are available, country-fixed effects are typically not introduced because the instruments have little or no time variation.[4] The main difference between these and our contribution is our emphasis on using time-varying instruments in a panel context.

Summarizing, our results attempt to improve upon previous findings about the effect of cultural attitudes on the labor market, in particular on the seminal contributions of Algan and Cahuc (2007) and Fortin (2005) in three respects: (i) by addressing the problem of endogeneity, (ii) by relying on a dynamic specification of the equations for

---

2. The correlation between the behavior of immigrants and that of residents in the country of origin has been noted and exploited by several authors. For instance, Giuliano (2007) documents and studies the similarity in the living arrangements of children of immigrants with those in the country of origin. Fernandez (2007) uses both female LFP and attitudes in the women's country of ancestry as cultural proxies and show that both proxies have significant effects on women's work outcomes. Antecol (2000) also uses such an epidemiological approach. Algan and Cahuc (2010) use the attitudes of American immigrants towards trust as an instrument to study the effect of trust on the growth rate of a country's per capita income in the long run (between 1935 and 2000). Fernandez and Fogli (2009) analyze fertility outcomes and labor market outcomes for US women, and instrument culture with past female labor force participation and total fertility rates from the woman's country of ancestry.

3. Brugger, Lalive, and Zweimuller (2010) use a regression discontinuity design across language barriers in Switzerland to investigate the effect of culture on unemployment.

4. The exception is Tabellini (2010) who instruments cultural traits—such as trust, obedience, and respect—with past literacy rates and past institutions, and runs a cross-sectional regression with regional data. This allows him to introduce country-specific effects.

labor market outcomes that allows for their persistence, and (iii) by controlling for a more extended menu of policies, institutions, and structural variables.

We find that, even after instrumenting, controlling for the role of time-varying structure, policies, and institutions, and for the persistence of participation and hours worked, culture still matters for two out of the three outcomes under study. Attitudes towards women's role in the family and attitudes towards leisure are statistically and economically important determinants of the employment rate of women and of average hours worked, respectively. However, policies and other institutional or structural characteristics of the labor market also matter, even when we recognize that policies and institutions may be endogenous because they may reflect changing economic conditions and cultural values. Our measures of attitudes towards youth independence, however, does not appear to be important in explaining the employment rate of the young. In the case of women employment rates, the policy variable that is significant, along with attitudes, is the OECD index of employment protection legislation. For hours worked the policy variables that play a role, along with attitudes, is the tax wedge and, although less strongly, benefits. The quantitative impact of these policy variables (in particular, employment protection legislation and taxes) is large.

The paper is organized as follows. In Section 2 we describe how the WVS data can be used to measure attitudes in OECD countries. In Section 3 we describe the econometric issues one faces when trying to assess a causal effect of attitudes on labor market outcomes. In order to make some progress, we outline a GMM strategy that uses the evolution over time of deeper attitudes and the changes in attitudes of immigrants to the United States from various countries as instrument, in addition to lagged values of labor market outcomes and attitudes. In Section 4 we discuss in more detail the choice and measurement issues related to these instruments. In Section 5 we report the Within estimates (which do not address the issue of endogeneity, nor the persistence of outcomes) to provide a baseline and a comparison with previous results. Section 6 contains the results of the GMM estimation of dynamic models for employment and hours. Section 7 concludes.

2. What Do We Mean By Culture And How Do We Measure It?

The WVS includes a number of questions whose answers can be used to measure beliefs and values that are likely to be relevant for the aggregate employment rate of women and of the young, and for average hours of work. Such beliefs evolve over time, although they are likely to contain a country-specific time-invariant component.

The answers to a first set of questions capture cultural attitudes towards women work that are likely to affect women employment rates. One such question is, "Do you think that a woman has to have children in order to be fulfilled or is this not necessary?" We also experiment with the answers to the question, "Do you agree or disagree with the following statement?: When jobs are scarce, men should have more rights to a job than women", and to the question, "Being a housewife is just as fulfilling as working for pay" but more sparingly, since they are available for a shorter period of time. As

we have pointed out in the Introduction, when using these answers one must be aware that high employment rates for women are likely to be both an effect and a cause of attitudes towards what is necessary for a woman's fulfillment. The endogeneity problem this poses is discussed more fully in the next section.

To capture attitudes towards leisure we use the question, "Here are some more aspects of a job that people say are important. Please look at them and tell me which ones you personally think are important in a job . . . Generous holidays . . . ". The attitudes towards leisure are obviously relevant in determining hours worked, although, once again, the answers might be affected by the cyclical state of the labor market, or by other institutional features of the labor market, such as the strength of unions.

Finally, the question we use to measure attitudes that could affect the employment rate of the young is, "Here is a list of qualities that children can be encouraged to learn at home. Which if any do you consider to be especially important? . . . Independence . . . ". The answer to this question might also be affected by fluctuations in the youth employment rate and by the state of the aggregate labor market. We also experiment with answer to the statement "Parents should do their best for their children even at the expense of their well-being".

We rely on the questions we have just reported to construct measures of attitudes to be used as explanatory variables for the three labor market outcomes we are interested in: the employment rate of women, that of the young, and the average yearly hours worked by those who have a job. Since our dependent variables are aggregate labor market outcomes, we need to aggregate the individual answers to the attitudinal questions at the country level for each period. One option would be to take simple averages of the individual answers in each wave. However, since individual answers reflect both country and individual characteristics, the evolution of average attitudes may then simply reflect changes in the composition of the WVS sample. Moreover, with an average size of approximately 700 respondents, one may have some worries about its representativeness. Finally, we want to minimize the risk that the answers simply reflect the personal labor market experience of the respondent.

For this reason we follow an alternative procedure proposed by Algan and Cahuc (2007): we estimate a probit model for each question for each wave controlling for the main individual characteristics and including country-effects which capture the role of specific national features.[5] We use data for all those OECD countries in the WVS for which data are available at (approximately) equally spaced intervals of ten years (around 1980, 1990, and 2000) and we estimate the probit for the sample of working age population between 16 and 64 years of age.[6] We control for age and age squared, for the level of education, marital status, the number of children, the family income

---

5.   As an example, we present the results of the probit model for the wave 1999–2004 in Table A.2. This table, as well as others to which we shall refer, is available in the Online Appendix that accompanies this paper.

6.   For most countries the attitude variables we use are available for all three waves. For some countries, for only two waves. Details, including the precise timing of the surveys, are contained in the Online Appendix.

(coded by the surveys as low, middle and high income), and for the employment status. The inclusion of the employment status should minimize the risk that answers to the attitudinal questions may be a pure reflection of one's employment experience. We also include the respondent's political views (coded by the surveys as left, center and right) and their religious views by distinguishing the following main categories: Catholic, Protestant, Buddhist, Muslim, Jews, other religions, and with no religion affiliation. The variables we use to measure cultural attitudes are thus the estimated wave-specific country effects in the probit regressions for attitudes.

Using the within-country variation of the country/wave effects one can hope to identify the effects on labor market outcomes of the time varying components of attitudes, controlling with country fixed effects for those components that remain unchanged over time and which cannot be separated from other country-specific and time-invariant components of institutions and policies. The data show that indeed there is time variation (and thus attitudes are not only a country fixed effect) and that the pattern differs across countries (and thus it is not captured by a common year effect).[7] In all cases, the appropriate *F*-tests suggest that the country/wave effects change significantly over time (with a *p*-value of less than 1%).[8]

Regarding the attitude towards women work, the pattern for many countries shows a shift toward 'conservatism' (meaning that the country-wave effects of the answers shift towards a view that women need to have children to be fulfilled) from 1980 to 1990, followed by a shift in the opposite direction in the following decade. Such shifts are consistent, possibly, with a political shift from progressive to conservative (Reagan in the United States, Thatcher in the UK, . . .) that occurred in many countries at the beginning of the 1980s, followed by a shift toward more progressive politics (Clinton, Blair, . . .) in the following decade.[9] However, within this common pattern, the shifts occur with an intensity that varies across countries.[10]

The country-wave effects of the attitudes towards youth independence and towards leisure show that all measures of culture we use are also time varying. The value placed on youth independence appears to increase during the 1980s and decrease in the 1990s, although also at different rates in each country. The evolution of attitudes towards holidays does not display any common pattern, although the importance of generous holidays increases (at different rates) for all countries between 1980 and 1990 and decreases or remains stationary for most countries from 1990 to 2000.

---

7. The estimated country wave effects are available in the Online Appendix, Table A.3.

8. To perform the test we have imposed the restriction that the coefficients on the individual characteristics are the same in each wave.

9. Fortin (2009) also shows, mostly using the 1972–2006 GSS, that these cultural traits are not an unchanging primitive. She reports evidence of large cohort effects: women tend to become more outward oriented, but there is a change in this trend in the 1990s.

10. Given the pattern of attitudes towards the role of women in the labor market, a natural question arises as to the determinants of such evolution. For a theoretical analysis see Bisin and Verdier (2001), Fogli and Veldkamp (2007), Fernandez (2008), and Tabellini (2008a). For an empirical investigation see Fernandez, Fogli, and Olivetti (2004) and Farré and Vella (2007).

The outcome variables we focus on are, as we already said, the employment rate for women and for youth, and (log) average annual hours.[11] These labor market outcomes differ substantially across OECD countries. In the period 1999–2002, for instance, the employment rate of women in the age bracket 16 to 25 was on average 41% in Mediterranean countries, 43% in Continental Europe, and 58% in Anglo-Saxon countries. In the same years the employment rate of women was 59% in Mediterranean countries and 80% in Nordic countries. More importantly for our purposes, these variables have also evolved differently for each group of countries (and within each group) over time: for instance, between the early 1980s and the beginning of this decade the employment rate of women has not changed much in the Nordic countries, while it has increased by almost 20 percentage points in Continental Europe and in the Anglo-Saxon countries, and by 6 points in Japan. The evolution pattern of employment rates for youth also varies across countries: it falls by 15 percentage points in the Mediterranean countries, more quickly in the 1980s; it falls in the Nordic countries in the 1980s and then it remains stable in the 1990s; it falls and then recovers in the Anglo-Saxon countries. Average hours of work tend to decrease in the 1980s, although at a different pace in each group of countries. In the 1990s, the rate of decrease tends to be smaller in Continental countries, and near to zero in Mediterranean and Nordic countries.

The bottom line is that our measures of attitudes are not constant over time and vary at different rates for different countries. Their effect on labor market outcomes can, therefore, be identified separately from that of other cultural traits that instead are constant over time and therefore can not be separated from other non-time-varying country characteristics. If we assume that the time-varying and the time-invariant components of attitudes have identical effects on labor market outcomes, what we estimate is the effect of attitudes tout court. If instead the two components have different effects on outcomes, what we estimate is just the effect of the time-varying one. Whether the correlation between labor market outcomes and attitudes can be given a causal interpretation (going from attitudes to outcomes) is the issue we address in the following sections.

3. Issues in Estimating the Effects of Culture

In the previous section we have discussed the variation across countries and over time of our country- and year-specific measure of culture. This measure is the country-wave effect in a cross-sectional probit equation for each attitude, estimated on individual data for all countries at each point in time. Let A_{ct} denote this survey-based measure of country c's cultural attitudes at time t. We intend to estimate the effect of A_{ct} on economic outcomes, denoted by Y_{ct}, where Y_{ct} is determined by the following

11. For most countries, all these variables represent four-year averages over the period 1981–1984, 1990–1993, 1999–2002. We will also use data for the 1972–1975 period in models with the lagged dependent variable. See the Online Appendix for further details.

equation:

$$Y_{ct} = \alpha_0 + \alpha_1 Y_{ct-1} + \alpha_2 A_{ct} + \alpha_3' X_{ct} + \Psi_c + \Psi_t + \varepsilon_{ct}, \qquad (1)$$

where Ψ_t denotes common time effects. The country-specific and the idiosyncratic components of the error term, Ψ_c and ε_{ct}, are independently distributed across c, and have the standard error component structure in which $E(\Psi_c) = 0$, $E(\varepsilon_{ct}) = 0$, $E(\Psi_c \varepsilon_{ct}) = 0$, and $E(\varepsilon_{ct} \varepsilon_{cs}) = 0$ for $s \neq t$. X_{ct} is a vector of other, time-varying variables that may influence the outcome of interest. They include time-varying institutions, policies, and other time-varying structural characteristics of a country. For ease of exposition, we will assume for the time being that the variables in X_{ct} are strictly exogenous. However, policy and institutional variables are also either endogenous or, at best, predetermined. We will address this issue in what follows.

If there is persistence in Y_{ct} that goes beyond the one generated by the fixed effect Ψ_c or the persistence of the regressors, this justifies the inclusion of the lagged dependent variable in the equation. This seems a very plausible hypothesis for employment rates and hours. The main problem in estimating (1) arises because attitudes are likely to be correlated with the shock to the labor market outcome equation ($E(A_{ct}\,\varepsilon_{ct}) \neq 0$). Obviously, A_{ct} is also likely to be correlated with the time-invariant and country-specific component of the error term, Ψ_c, but assume for the time being that this issue can be addressed through an appropriate transformation of the data that removes Ψ_c from the equation. However, the endogeneity of A_{ct} and the presence of the lagged dependent variable makes the Within transformation not the appropriate one when the panel is short in the time dimension, as it is in our case.

The main reason why $E(A_{ct}\,\varepsilon_{ct}) \neq 0$ is because country-time specific measures of attitudes obtained from survey responses on women's role in the family and in the workplace are likely to be affected not only by past but also by contemporaneous shocks to labor market outcomes. For instance, high employment rates for women may reinforce the sense that having a role in the formal labor market is both rewarding and acceptable, and may lessen the perception of motherhood as a necessary component of fulfillment.[12] Overlooking these endogeneity issues may lead to an overestimate of the effect of attitudes towards women in the workplace on employment outcomes. Also in the case of attitudes towards the young, one can imagine that a buoyant youth labor market may affect perceptions about the desirability of youth independence as a character trait, even though it is not a priori clear how. The attitude about the importance of generous holidays is also likely to respond to shocks to actual hours of work, although also in this case the direction of the response is debatable. Working longer hours may be associated with an increase in the desire for leisure, through an income effect or due to stress when annual hours actually worked get longer and longer. However, if hours and wages are positively associated, longer hours would be

---

12. In the regression generating the country-wave attitude variables we control for an individual's employment status. However, this is not enough to eliminate the endogeneity problem because individual responses may be affected not only by one's experience, but also by aggregate conditions.

associated with a demand for less leisure, through the substitution effect. The general point we are making is that cultural attitudes shape economic outcome but are also shaped by such outcomes. The interplay between the formation of attitudes towards work and economic conditions has been emphasized recently by Doepke and Zilibotti (2008) who develop a model of preference formation that emphasizes the two-way interaction between the development of attitudes towards leisure and patience and socioeconomic change during the Industrial Revolution. Such interplay may exist also at higher frequency and poses a challenge in estimating the effect of cultural attitudes on labor market outcomes.

What can be done to address this endogeneity issue? Today's attitudes are likely to depend upon past attitudes because there is persistence in attitude formation, and upon past outcomes as well as current outcomes. This observation suggests a strategy based on 'internal' instruments in the context of the GMM difference estimator proposed by Arellano and Bond (1991) or the GMM system estimator of Blundell and Bond (1998). The GMM estimator is designed for dynamic panel models with lagged dependent and endogenous regressors that renders inappropriate the use of the Within estimator when the time dimension is short, as it is in our case.[13] More precisely, we will use appropriately lagged values of the levels of Y_{ct} and A_{ct} for the equation in difference, and of their differences for the equation in levels. Taking first differences of equation (1) in order to eliminate the country-specific time-invariant component of the error term we obtain

$$\Delta Y_{ct} = \alpha_1 \Delta Y_{ct-1} + \alpha_2 \Delta A_{ct} + \alpha'_3 \Delta X_{ct} + \Delta \Psi_t + \Delta \varepsilon_{ct}. \tag{2}$$

The GMM difference estimator uses the fact that Y_{ct-j}, A_{ct-j} with $j \geq 2$ are legitimate instruments for ΔY_{ct-1} and ΔA_{ct}, if ε_{ct} is serially uncorrelated and provided that these longer lags do not appear on their own as explanatory variables in the outcome equation. In the GMM system estimator the orthogonality conditions for the differenced equation are augmented by the orthogonality conditions for the level equation (1). Blundell and Bond (1998) show that under appropriate assumptions about the initial conditions, we can use ΔY_{ct-1}, ΔA_{ct-1} as instruments for Y_{ct-1} and A_{ct} in the equation in levels (1). If ε_{ct} is a random walk one may advance the instruments for the difference equation by one period, but ΔY_{ct-1} and ΔA_{ct-1} would not be legitimate instruments for the level equations. We discuss this issue in more detail in Section 6

In addition to these internal instruments we shall use other, deeper and slower moving, attitudes that evolve over time, but for which it is reasonable to assume that they respond to shocks to the labor market with a lag.[14] If these deeper cultural attitudes

---

13.   See Nickell (1981). In our case we have observations for three periods at ten-year intervals for the attitude variables (from 1980 to 2000) and observations for four periods (from 1970 to 2000) for the outcome variables and some of the structure/policy variables.

14.   Fortin (2009) uses attitudes towards premarital sex as instruments for gender role attitudes. Guiso, Sapienza, and Zingales (2006) employ the percentage of adherents of various religious denominations as an instrument for thrift in a regression with aggregate saving as the dependent variable in a pooled OLS regression.

are uncorrelated with contemporaneous labor market shocks and affect labor market outcomes only through attitudes towards women working, youth independence, and leisure, they can be treated as predetermined and their appropriately lagged values could be used as additional instruments. We will discuss in the next section the extent to which religious attitudes can be used for such purpose. Denote such deeper attitudes with A_{ct}^d: then A_{ct-j}^d with $j \geq 1$ are legitimate instruments for ΔY_{ct-1} and ΔA_{ct}, given the serially uncorrelated nature of ε_{ct}. In the GMM system estimator ΔA_{ct}^d can be used as instruments for Y_{ct-1} and A_{ct} in the equation in levels (1).

As an additional set of instruments, we shall use the attitudes of immigrants into the United States to instrument for the attitudes in the country of origin (excluding the United States). Algan and Cahuc (2010) rely on the attitudes of immigrants into the United States of a previous generation in a reduced-form framework.[15] We use the contemporaneous values of the attitudes of immigrants in the United States from a given country at a given point in time as an instrument for the attitudes of the country of origin at the same time.

More specifically, assume that A_{ct}^{US} denotes the country of origin (c) and period (t) attitudes towards gender, youth and leisure, or other attitudes potentially correlated with labor market attitudes, of first- or higher-generation immigrants to the United States, after controlling for personal characteristics (in the next section we will discuss in details which attitudes of US immigrants we will use as instruments for attitudes in the country of origin). One could include in the sample all immigrants, except those who have come to the United States after 1980, so that none of them has experienced the labor market in the home country during the period we use for estimation (1980–2000). If one is worried about the possibility that first-generation immigrants in the United States may maintain close information or family ties with the country of origin and be affected by the evolution of attitudes and outcomes there, one can exclude first-generation immigrants from the sample. We will follow the latter strategy and focus on second or higher generation immigrants.

The first issue at stake is why the time evolution of attitudes in the country of origin and those of immigrants to the United States should be correlated. Are there common or correlated factors that determined both? It is plausible to assume that some of the determinants of immigrants' attitudes are correlated with the determinants of attitudes in the country of origin. This is likely to be the case for variables representing the ethnic group specific effect of broad cultural or political changes and technological innovations (the feminist movement, swings towards political conservatism, innovation in contraception technology, etc.). For instance, changes in the contraception technology available are likely to be correlated across countries and to generate correlated effects over time on the attitudes of country c and on the attitudes of immigrants in the United States from country c because they are filtered

---

15. Algan and Cahuc replace the country-level attitudes for Trust in 2000 and in 1935 with the corresponding inherited attitudes of second (or higher) generation immigrants in the United States. The unobservable country-level attitudes in 1935 are those inherited by second-generation Americans born before 1910, of third-generation born before 1935, and so on.

through a partly common cultural background, even though law and regulations differ across countries. A possible source of concern is that a selection issue may affect the emigration decision in the sense that people who decided to leave may be those who are more independent and less attached to the values of the country of origin (Alesina and Glaeser 2004; Alesina and Giuliano 2010). This would weaken our instruments. Ultimately, the data will suggest whether the evolution of the attitudes of immigrants into the United States is informative about the evolution of attitudes in the country of origin.[16]

The second issue is whether A_{ct}^{US} is uncorrelated with the error term in the outcome equation in country c at time t. Clearly A_{ct}^{US} is likely to be correlated with the country effect in the outcome equation, Ψ_c, since the latter contains, among other elements, time-invariant and country-specific components of culture that are partly transmitted to US immigrants. However, it is plausible to assume that after conditioning on time-varying country variables X_{ct} (that will include a country-specific measure of business cycle conditions, policies, and institutions) and a common time effect Ψ_t, A_{ct}^{US} is not correlated with the idiosyncratic shocks to labor market outcomes in country c at time t, ε_{ct} (or at any time period). Under these assumptions, it is legitimate to use (in countries other than the United States) ΔA_{ct}^{US} as an instrument for ΔA_{ct} in the difference equation, and for A_{ct} in the level equation. Note that in the case of the attitudes of US immigrants the exclusion restriction (i.e. that they do enter directly in the equation for labor market outcomes) is very plausible.

In any case, we report in what follows on the Hansen–Sargan test of overidentifying restrictions to test the lack of correlation between the instruments and the error term in the outcome equations and we will assess their relevance by estimating the appropriate first-stage regressions. Recall that in the GMM system estimator we have two sets of first-stage regressions: one in differences and one in levels, with coefficients that can vary in each cross-section. For the equation in difference, equation (2), assuming α_3' equal to zero for simplicity, the first-stage regression for ΔA_{ct} is a variant of

$$\Delta A_{ct} = \pi_{0t}^d + \pi_{1t}^d Y_{ct-2} + \pi_{2t}^d A_{ct-2} + \pi_{3t}^d A_{ct-1}^d + \pi_{4t}^d \Delta A_{ct}^{US} + \omega_{ct}^d, \qquad (3)$$

where further lags of Y_{ct-2}, A_{ct-2} A_{ct-1}^d and ΔA_{ct}^{US} could also be included, if available. For the equation in levels the first-stage regression for A_{ct} is a variant of

$$A_{ct} = \pi_{0t}^l + \pi_{1t}^l \Delta Y_{ct-1} + \pi_{2t}^l \Delta A_{ct-1} \, \pi_{3t}^l \Delta A_{ct}^d + \pi_{4t}^l \Delta A_{ct}^{US} + \omega_{ct}^l. \qquad (4)$$

We have experimented both with time-varying and time-invariant coefficients, and we have settled in favor of the latter option, given the limited number of cross-sectional observations at our disposal. The asymptotic properties of GMM estimators depend upon the number of cross-sectional units being large: the number of countries for which data are available (when we use the attitude of US immigrants as one of

---

16.   As discussed in footnote 2, the evidence suggests that cultural traits of the country of origin are maintained by immigrants.

the instruments) is 16, which is less than optimal and constitutes a limitation of our exercise.[17] On the other hand, the GMM estimator allows us to address the endogeneity issue in dynamic panels—something that has not been done so far in this literature. We will also extend the cross-sectional dimension of the data by estimating the model on regional data for European countries.

So far the discussion has been conducted under the implicit assumption that we can perfectly observe the attitudes towards gender, the young, or leisure. Assume now that we can observe all attitudes only with an error so that

$$\tilde{A}_{ct} = A_{ct} + \mu_{ct}^A, \ \tilde{A}_{ct}^d = A_{ct}^d + \mu_{ct}^{A^d} \ \text{and} \ \tilde{A}_{ct}^{US} = A_{ct}^{US} + \mu_{ct}^{A^{US}},$$

where tilde denotes measured variables and the μ' are serially uncorrelated measurement errors. This would lead to attenuation bias when the outcome equations are estimated by least squares procedures. As is well known, the attenuation bias typically is greater after demeaning the data (as in the Within estimator) or applying first differences. In this sense it is a more serious issue in a panel context than it is in a cross-sectional setting.[18] Our instrumental variable procedure in principle can address the measurement error issue: we now need to assume that measured attitudes of US immigrants, or measured deep attitudes, are not correlated both with the shock to the outcome equation, ε_{ct}, nor with the measurement error for attitudes towards gender, youth, and leisure, μ_{ct}^A.[19] Under these assumptions we can deal with the measurement error in the sense that our instruments will be uncorrelated with the errors. However, in the presence of measurement error, we must recognize that the efficiency of our estimates may decrease as the information content for true labor market attitudes of measured deep attitudes and measured attitudes of US immigrants decreases.

It is necessary at this point to discuss the potential endogeneity of some of the variables included in X_{ct}, such as policies and institutions. Policies and institutions cannot be treated as strictly exogenous variables. They are likely to be correlated with contemporaneous or lagged shocks to labor market outcomes and, therefore, must be treated either as endogenous or predetermined variables and need to be instrumented.[20] For instance, a negative shock to employment may induce unions to lobby for stricter employment protection legislation or for more generous unemployment benefits.[21]

---

17. See Soto (2010) for small-sample properties of various GMM estimators. The paper suggests that the system GMM estimator tends to have the lower bias and higher efficiency, provided the series have some persistence.

18. See Griliches and Hausman 1986.

19. For our additional instruments this requires that the measurement errors be uncorrelated with each other. More precisely, when using the attitudes of US immigrants as instruments, for instance, one needs to assume lack of correlation between (i) A_{ct}^{US} and ε_{ct}, as before, (ii) between $\mu_{ct}^{A^{US}}$ and ε_{ct}, and (iii) between μ_{ct}^A and both A_{ct}^{US} and $\mu_{ct}^{A^{US}}$. Parallel assumptions are needed for measured deep attitudes.

20. In Section 6 we will discuss which policies/institutions will be considered endogenous and which ones predetermined.

21. See Aghion, Algan, and Cahuc (2011) for a theoretical and empirical investigation of the relationships between labor market institutions and policies, and beliefs about cooperation in the labor market.

They could also be correlated with attitudes: for instance, more conservative views of gender roles may be associated with policies that tend to protect the male bread-winner model.[22] For policies and institutions we will use the same instrument set that we use for attitudes. Finally, we will allow for the fact that there tends to be an element of persistence in policies and institutions so that their past values contain information about their present and future values.

4. More on the Choice of Instruments

We have outlined in the previous section our basic strategy to address the endogeneity of attitudes (and policies) based on augmenting the set of internal instruments with 'deeper attitudes' in the country of residence and attitudes of US immigrants. We will discuss now in more detail the choice of these additional instruments, how we construct them using the answers to questions in the WVS and in the US General Social Surveys (GSS), and why they may be informative about the evolution of *women_cn*, *youth_i*, and *holidays*.

Among deeper attitudes, we focus mainly on religious beliefs. It has been suggested that religious beliefs may signal more conservative values, among them the idea that women should be subordinated to men and naturally belong to the home.[23] It has also been suggested that this may be particularly true for Christian traditions with an emphasis on hierarchy, such as Roman Catholicism and Eastern Orthodoxy.[24] Among Protestants, Max Weber's hypothesis would imply a positive correlation between religious beliefs and work ethic, with more emphasis on work versus leisure and, possibly, a more favorable view of women's employment.[25] However, there is evidence that for Catholics there has been a change in the nature of religious beliefs and their association with attitudes towards women after Vatican II.[26] All this suggests that indices of religiosity are instruments worth exploring, particularly if interacted with the historically dominant religious affiliation of each country.

In order to measure religious beliefs, we rely mostly on the WVS answers to the question: "Which, if any, of the following do you believe in?...God...". This religious attitude variable is interacted with a country's prevalent historical religious affiliation: Catholic, Protestant, and other (Japan is the only country in our sample belonging to this third group). More precisely, our instrument is, as in the case of labor market attitudes, the wave-specific country effect obtained from estimating a separate probit for each wave containing country effects and individual characteristics

---

22.   Actually, policies themselves may contribute to the evolution of cultural attitudes. For instance, the existence of generous childcare may affect the evolution of attitudes towards women in the work place by making it easier to combine market work with family responsibilities.

23.   Guiso, Sapienza, and Zingales (2003) present micro evidence that the presence of religious beliefs and their intensity is associated with less favorable attitudes towards women working.

24.   See, for instance, Archimandrite (1981, p. 38).

25.   Weber 1930.

26.   See Guiso, Sapienza, and Zingales (2003).

of the respondent (consistently with what we have done for attitudes towards women work, youth independence, and leisure). We have also used a measure of the intensity of religious practice contained in the answers to the question "Apart from weddings, funerals and christenings, about how often do you attend religious services these days?" We will rely mostly on the answer to the belief question because the frequency of church attendance is likely to respond rather quickly to economic shocks, which would invalidate it as instrument. For instance, Gruber and Hungerman (2008) provide evidence that there was a decline in church attendance following the repeal of laws restricting Sunday retail activity. Belief in God also may evolve over time in response to economic conditions, but it is plausible to assume that such response is slow.[27] No approach is fool-proof, so it is useful to pay attention to the test of overidentifying restrictions and how the results change for different instrument sets.

If we regress the level and change of *women_cn* on the change and the lagged level, respectively, of such religious belief variables interacted with the historically dominant religious affiliation and time dummies, the *F*-test on the set of belief in God variables (*God)* suggest that our measure of belief in God is informative for the level of *women_cn*, but not so much for its change.[28] Note that an increase in the percentage of believers in historically Catholic countries (there are no Eastern Orthodox countries in our sample) or in Japan (the only non-Catholic or non-Protestant country in our sample) is associated with a significantly lower level of *women_cn*, while this is not the case for the historically Protestant countries. Concerning the consequences on attitudes towards leisure, the results suggest that there is useful information in religious beliefs for the level and change of *holidays*, although more for the former than the latter.[29] In the equation for the level of holidays an increase in belief in God in historically Protestant countries is significantly and negatively associated with holidays, while there is no significant association for Catholic countries (and a positive and significant one for Japan). The difference between Catholic and Protestant countries is broadly consistent with the arguments summarized in the previous paragraph.

Finally, we have also explored as instruments attitudes towards sex, but without much success. More conservative values towards sexual relationships could be associated with a more traditional view of the role of women in the home relative to their role in the workplace.[30] Moreover, if more conservative attitudes toward

---

27. For instance, beliefs in God (or participation in organized religious activities) can change in response to economic development (secularization hypothesis) and to changes in competition among religion providers ('supply-side' theory), see Barro and McCleary 2004.

28. The *p*-value for the *F*-test is 0.0021 in the first case and 0.287 in the second. See Table A.5 in the Online Appendix for details. Similar results are obtained using the degree of religious beliefs, measured by weekly church attendance. The *p*-value for the *F*-test is slightly higher. This pattern is repeated in the first-stage regressions for *holidays*. Recall that given our assumptions on the predetermined nature of religious belief, its value lagged once is the earliest available instrument.

29. In the equation for the change in *holidays,* the low *p*-value for the *F*-test is entirely due to the significance of the coefficient of the interaction of *God* with the Japan dummy. Beliefs in God do not matter for Protestant or Catholic countries.

30. Fortin (2009) uses contemporaneous individual attitudes towards sex and politics in the country of residence as an instrument for family attitudes in an equation that explains a woman's participation decision in the United States.

premarital sex reflect a more traditional and hierarchical society, they may be also informative about attitudes towards leisure, because in hierarchical societies people may tend to engage in more nonmarket, family-centered activities. There is a question in the WVS about the importance of happy sexual relationship for a marriage ("Here is a list of things which some people think make for a successful marriage. Please tell me, for each one, whether you think it is very important, rather important, or not very important: happy sexual relationship, how important is this for a successful marriage?..."), but it is not clear that it is a good measure of liberal attitudes towards sex. Indeed answers to this question do not appear to contain useful information for any of the attitudinal variables we use as regressors.

The other set of additional instruments are the attitudes of second or higher generation immigrants to the United States, classified by country of origin, obtained from the GSS. The idea here is that the evolution over time of the attitudes of each immigrant group is informative about changes of attitudes in the country of origin, because, for instance, cultural, political, and technological shocks that possess a common component across countries are filtered through a sensitivity that is similar in each specific immigrant community to the United States and in the country of origin.

To capture the attitudes of US second (or third) generation immigrants towards women working we use answers to the question "Do you approve or disapprove of a married woman earning money in business or industry if she has a husband capable of supporting her?" These answers capture attitudes towards the 'male breadwinner' model, and suggest themselves as a natural instrument for gender attitudes in the country of residence. Unfortunately, there are no questions in the GSS similar to those in the WVS on youth independence and the importance of generous holidays. Instead, two questions that turn out to be useful concern attitudes towards sex and trust. To capture attitudes towards sex we use the answers in the GSS to the question "There's been a lot of discussion about the way morals and attitudes about sex are changing in this country. If a man and woman have sex relations before marriage, do you think it is always wrong, almost always wrong, only sometimes, or not wrong at all?" The answers to this question appear, prima facie, to provide useful information about how liberal are attitudes about sex. Such liberal orientation may be informative about attitudes towards the labor market of US immigrants and of residents of the country of origin. Finally, we have also experimented with using attitudes towards trust (the question is identical in the GSS and in the WVS) in immigrant communities as instruments for our attitudinal regressors for the reasons we have already discussed.[31] We denote with *imm_fework, imm_sex*, and *imm_trust* the country-wave effects for immigrants attitudes towards women work, sex, and trust.

We find that changes in attitudes towards women working and sex of immigrants in the United States are positively and significantly associated with those of residents in the country of origin (after partialling out the time dummies). More precisely, the correlation coefficients between Δimm_fework and Δimm_sex are 0.386 and 0.382 respectively and are significantly different from zero at the 5% level. Δimm_trust and

---

31.   For a discussion of the determinants of trust see Alesina and La Ferrara 2002.

Δ*imm_sex* are significantly associated (at around the 5% level) with the change and level of *holidays*.

5. Within Estimates

In this section we present and discuss a set of results obtained by estimating an equation for the employment to population ratio for women (*epr_w*) and youth (*epr_y)* and for the log of average annual hours of work (*hours)*, using the Within (or least squares dummy variable, LSDV) estimator. The explanatory variable for *epr_w* is our measure of the cultural attitudes towards the need of having children for a woman to feel realized (*women_cn)*. The variable is derived as the country/wave effect described in Section 2 and is coded in such a way that increasing values denote a more progressive attitude towards women. For youth employment rates, the cultural variable captures the importance given to youth independence as a desirable trait (*youth_i)*. Listing generous holidays as an important attribute of a job (*holidays)* is the attitudinal variable used to explain the log of average hours of work (*hours)*.

The Within estimator allows for country-specific and time-invariant effects. Such effects capture both time-invariant cultural traits and time-invariant institutions, in addition to other time-invariant country characteristics that may affect the employment or hours outcomes. They also control for country specificity in interpreting the survey question and for lack of cross country comparability of the dependent variable. This is not a problem for female and youth employment rates, but is a potential problem for the hours of work series available.[32]

The main drawback of the Within estimator is the fact that it does not recognize and address the endogeneity of the cultural variables discussed in the previous section. Another drawback is that one cannot properly address the issue that employment and hours are likely to evolve gradually over time in response to shocks. This would require the inclusion of the lagged dependent variable as an additional regressor. In this case, however, the Within estimator would not yield a consistent estimate of the coefficient on the lagged dependent variable, and of the coefficients on the other variables too, even if the latter were strictly exogenous, since the time dimension is small (equal to three in our case).

Yet, the Within estimates are a useful starting point because they address some of the issues we are interested in (although not all) and have been used in the paper that is most closely related to ours—Algan and Cahuc (2007), who analyze the employment rates for women and youth in OECD countries using three waves of the WVS between 1980 and 2000.[33] That paper uses the attitude towards the priority

---

32.   The OECD warns that the new series for hours they have produced and that we are utilizing (and that differs from the one used in Alesina, Glaeser, and Sacerdote, 2005) is homogeneous through time within each country, but is not comparable across countries. This emphasizes the importance of including a country fixed effect in the regression.

33.   Algan and Cahuc also analyze the employment rate for older workers as a function of attitudes towards forcing older workers to retire when jobs are scarce. We do not analyze the latter variable because

of male employment when jobs are scarce (*women_jp*)as the explanatory variable for the equation for women, and the same attitudinal variable we use for youth (*youth_i*). Fortin (2005) presents estimates for the female employment rate in OECD countries in a specification that also considers multiple waves (roughly 1990, 1995, and 2000), and uses both *women_jp* and whether being a housewife is as fulfilling as working for pay (*housewife*), but does not include country dummies.

As additional controls we include in the equations 'structural' variables, such as women education (*edu_w*), the share of services in value added (*serv_va*), the fraction of population above 65 (*pop_65*), and the average number of children per woman (*children*).We also include measures of (time varying) policies or labor market institutions, such as unemployment benefits (*ben*), employment protection legislation (*epl*), union density (*udens*), taxes on labor income (*tax_wedge*), and, for a subset of countries/specifications, expenditure on childcare per child (*childcare*).[34] We also control for the stage of the business cycle through a measure of the gap between actual and potential output (*gap*). In the Within regressions these variables are all treated as exogenous, although in reality they may be correlated with present or past shocks in the outcome equations. The inclusion of a large menu of structural, institutional, and policy variables allows us to isolate the direct effect of attitudes on outcomes. All equations also include a wave dummy to capture common time effects.

All the results are reported in Table 1 for a simple specification with only the cultural attitude variable, for a general specification with structural, policy, and business cycle variables and for a more restricted specification that retains only the more significant regressors among the latter group.

Attitudes about the need of having children for a woman to feel fully realized are positively associated with the employment outcomes for women (see columns (1)–(3)). The coefficient on this variable, however, is only significant at the 10% level in two of the three specifications and its value tends to decrease somewhat when one adds additional controls. If one uses *women_jp* as a proxy for attitudes, its coefficient is never significant, while the coefficient of *housewife* is significant in only one of the specifications. Note that these measures are available for at most two equispaced waves for a large set of countries, while *women_cn* is available for up to three waves.[35]

The *gap* variable is positively and significantly associated with the female employment rate in the more parsimonious specification. Among the structural variables, only the coefficient for the number of children is negative and significant in all specifications. Employment protection (*epl*) and taxes (*tax_wedge*) are the policy

---

it is only available for the 1990 wave of the WVS for all countries in our sample and for the 1995 wave for a smaller set of countries.

34.   See the Online Appendix for more details on the definition of each variable. Note that *epl* is increasing in the stringency of regulation and, in the sample, takes multiple values between zero and four. See Nickell, Nunziata, and Ochel (2005) for an analysis of the effects of time-varying policies on unemployment.

35.   For instance, the job priority question is available only for EVS/WVS1990, WVS 1995 for a limited number of countries, and EVS/WVS2000, see p. 134 of WVS Integrated Questionnaire. It is not available for the beginning of the 1980s. We do not use WVS 1995 because only a limited number of countries replied to the questionnaire and because we need equispaced intervals for the dynamic specification that is the core of our paper. See Table A.4 of the Online Appendix for results.

TABLE 1. Family and work attitudes and employment rates for women (epr_w), youth (epr_w), and log average annual hours (hours): Within estimates.

	(1) epr_w	(2) epr_w	(3) epr_w	(4) epr_y	(5) epr_y	(6) epr_y	(7) hours	(8) hours	(9) hours
women_cn	11.97*	7.529*	5.430						
	(6.732)	(4.007)	(5.245)						
youth_i				−9.984	−5.172	−5.625			
				(7.266)	(4.021)	(5.180)			
holidays							−0.0190	−0.00613	−0.0121
							(0.0389)	(0.0342)	(0.0325)
gap		0.466	0.706*		1.357*	1.271**		0.0113**	0.00813**
		(0.499)	(0.400)		(0.642)	(0.461)		(0.00439)	(0.00343)
epl		−7.585***	−5.153***		−3.230			−0.0522**	−0.0460**
		(2.241)	(1.759)		(3.266)			(0.0207)	(0.0168)
udens		−0.182			−0.149			0.00121	
		(0.225)			(0.116)			(0.00143)	
benall		−0.123			0.339			0.000453	
		(0.267)			(0.237)			(0.00109)	
tax_wedge		−0.759	−1.133***		−1.629***	−1.164**		−0.00321	
		(0.454)	(0.283)		(0.306)	(0.440)		(0.00369)	
children		−53.90**	−41.15***						
		(19.85)	(12.06)						
serv_va		0.396			−0.295			0.00382	
		(0.432)			(0.314)			(0.00331)	
pop65		−1.151							
		(0.910)							
edu_w		−0.986							
		(2.020)							
epr_w								−0.00332***	−0.00327**
								(0.000981)	(0.00119)
edu_y					−6.849				
					(4.929)				
Observations	46	46	46	47	47	47	44	44	44
Countries	17	17	17	17	17	17	16	16	16

Notes: Standard errors, in parentheses, allow for heteroskedasticity and correlation within each country. Period effects and country effects are entered in every column. women_cn is the country/wave fixed effect in the probit model that uses: "Do you think that a woman has to have children in order to be fulfilled or is this not necessary?" 1 denotes "not necessary", 0 "needs children". youth_i is the country/wave fixed effect in the probit model that uses: "Here is a list of qualities that children can be encouraged to learn at home. Which if any do you consider to be especially important?" 1 denotes independence being mentioned, 0 not mentioned. holidays is the country/wave fixed effect in the probit model that uses: "Here are some more aspects of a job that people say are important. Please look at them and tell me which ones you personally think are important in a job" 1 denotes generous holidays being mentioned, 0 not mentioned.
*Significant at 10%; **significant at 5%; ***significant at 1%.

variables that are negatively and significantly associated with employment rates in the more restricted specification. Surprisingly, women's education is never significant.

In some robustness exercises not reported here we have included childcare expenditures for a smaller set of the country-year observations for which it is available. Its coefficient is positive but significant, at best, at the 10% level. We have also experimented with the number of weeks of parental leave due to the birth of a child, which is available for all our observations (see Bassanini and Duval 2006). The coefficient of this variable is also not significant.

Taking these results at face value they do not provide support for the Algan and Cahuc (2007) conclusion that culture is the dominant determinant of female employment rates, while policies play a less important role. In our sample the direct effect of culture is often not significant, and the effect of policy is often more precisely estimated, although it is certainly possible that culture affects policies and institutions.

In columns (4)–(6) we report the Within estimates for the youth employment rate. Attitudes towards child independence as a positive trait (*youth_i*) are not significantly associated with youth employment rates (and actually the point estimates of the coefficient are negative). Youth employment increases significantly during expansions, and is negatively and significantly associated with taxation. Certainly, there is no support from these results for the proposition that cultural attitudes are important determinants of youth employment outcomes.[36]

Finally, in columns (7)–(9) we report the results for hours of work. Listing generous holidays as an important attribute of a job (*holidays*) is not significantly associated with actual annual hours. In addition to *gap*, other important variables are employment protection legislation and female employment rate (both with a negative coefficient). More employment protection is often associated with restrictions on work hours. Moreover, women are more likely than men to have part-time jobs, which explains the negative sign of *epr_w*.

Because of all the serious econometric issues we have outlined it is premature to draw any definitive conclusion from these Within regressions. The estimate of the coefficient of the attitude variables are biased and inconsistent, although it is not clear whether this leads to an overestimate or underestimate of their effect. It is therefore wise to suspend judgement on the effect of culture and policies until the next section.

6. Instrumenting for Attitudes: GMM Estimates

This section contains results of the effects of cultural attitudes and policies based on the GMM estimator for the employment rate for women and for (log) average hours worked. We do not report the GGM estimates for the youth employment rate. The difficulty in finding adequate instruments does not allow us to pin down the effect of either culture or policies on this outcome. In addition to the country-level results, for the employment rates of women we will also present evidence based on regional data.

6.1. Country-Level Results

In Table 2, columns (1)–(7), we present the GMM system estimates of the equation for women's employment rate.[37] We use the belief in God (interacted with the historically

---

36.   We have also experimented with the answers to the question "Parents should do their best for their children, even at the expense of their own well-being", but without greater success—this measure of attitudes is never significant (see Table A.4).

37.   The GMM estimates are obtained using the option xtabond2 in Stata. See Roodman 2006.

TABLE 2. Family and work attitudes and employment rates for women (epr_w). GMM system and difference estimates.

	(1) epr_w	(2) epr_w	(3) epr_w	(4) epr_w	(5) epr_w	(6) epr_w	(7) epr_w	(8) epr_w	(9) epr_w
l_epr_w	0.825*** (0.113)	0.904*** (0.0622)	0.788*** (0.0911)	0.892*** (0.0632)	0.858*** (0.0748)	0.834*** (0.0664) [.58,1.01]	0.772*** (0.0989)	0.502* (0.274)	0.646*** (0.201) [.36,1.09]
women_cn	4.441*** (1.021)	2.701*** (0.824)	4.739*** (1.590)	3.985*** (1.097)	4.771*** (0.965)	5.081*** (1.227) [3.98,13.02]	5.641*** (1.778)	3.885 (4.140)	10.18* (4.510) [1.13,28.12]
gap		1.873*** (0.480)	1.319*** (0.291)	1.661*** (0.370)	1.943*** (0.346)	1.622*** (0.338) [.81,2.63]	1.775*** (0.446)	1.545*** (0.521)	2.161*** (0.376) [1.77,3.20]
benall		0.0600 (0.0626)		0.0621 (0.0394)				0.0271 (0.465)	
tax_wedge		0.140 (0.116)		0.178 (0.136)				−0.518 (0.623)	
udens		−0.0897 (0.0650)		−0.0995* (0.0576)	−0.00808 (0.0449)			0.153 (0.269)	
epl		−0.760 (0.769)		−2.188 (1.355)	−2.124** (0.894)	−1.776** (0.811) [−6.69,−.44]	−3.800** (1.601)	−10.67*** (1.932)	−8.672** (4.400) [−21.10,−1.41]
pop65			−0.315 (0.466)	0.455 (0.540)				−1.709 (1.095)	
edu_w			0.355 (0.596)	−0.531 (0.686)				−4.825 (4.096)	
serv_va			0.0540 (0.247)	−0.242 (0.216)	0.369* (0.193)	0.306 (0.232) [−.48,1.18]	0.651*** (0.223)	1.261* (0.649)	0.891** (0.418) [0.04,1.90]
children			−38.11*** (8.406)	−25.19*** (9.171)	−37.16*** (7.750)	−36.87*** (8.081) [−86.02,−37.02]	−45.46*** (13.36)	−86.06*** (22.99)	−50.74*** (10.69) [−79.04,−35.10]

Continued

TABLE 2.   Continued.

	(1) epr_w	(2) epr_w	(3) epr_w	(4) epr_w	(5) epr_w	(6) epr_w	(7) epr_w	(8) epr_w	(9) epr_w
Observations	43	43	43	43	43	43	43	27	27
AR(1)z	1.981	1.098	0.720	0.438	0.212	0.559	0.432	−1.028	−0.121
HansPv	0.448	0.977	0.751	1.000	0.999	0.999	1.000	0.535	0.641

TABLE 2. Notes

	(3)		(6)	
First-stage col. (1)	women	$F = 8.6\{.000\}$	d.women	$F = 3.0\{.027\}$
First-stage col. (6)	women	$F = 12\{.000\}$	d.women	$F = 3.7\{.012\}$
	epl	$F = 3.3\{.021\}$	d.epl	$F = 3.0\{.029\}$
First-stage col (6), internal inst. only	women	$F = 14\{.000\}$	d.women	$F = 3.0\{.033\}$
	epl	$F = 3.8\{.008\}$	d.epl	$F = 3.5\{.017\}$
First-stage col (7)	women	$F = 16.2\{.000\}$	d.women	$F = 5.2\{.002\}$
	epl	$F = 2.6\{.05\}$	d.epl	$F = 2.5\{.053\}$
First-stage col (9)	d.women	$F = 5.2\{.002\}$	d.epl	$F = 2.5\{.053\}$
First-stage col (9), internal inst. only	d.women	$F = 3.0\{.033\}$	d.epl	$F = 3.5\{.017\}$

Notes: Period Effects are entered in every columns. Columns (1)–(6) report the system estimator results using religious beliefs of the country of residence (treated as predeterminate) and attitudes towards female work and sex of American immigrants (treated as exogenous) as instruments in addition to the appropriately lagged values of the regressors. Column (7) reports the system estimator using, in addition to the appropriately lagged values of the regressors, religious beliefs of the country of residence as an additional instrument for the level equation, and the attitudes towards female work and sex of American immigrants for the difference equation. Columns (8) and (9) report the difference estimator results using attitudes towards female work and sex of US immigrants as instruments, in addition to the appropriately lagged values of the regressors. For all variables only the shortest allowable lagged is used as instrument gap, benall, serv_va, children treated as endogenous; edu_w, tax_wed, udens, epl as predeterminate. When policy variables are included benall is used as instrument for the level eq. even when not included as a regressor. AR(1)z: Arelanno and Bond (1999) test of first-order serial correlation, distributed as ($N(0,1)$). HansPv: p-value of Hansen test of overidentifying restrictions. F denotes the F-test of significance of the instruments (besides the period dummies) in the first-stage regressions for selected variables (in levels or differences). p-value in curly brackets. Standard errors in parentheses.
*Significant at 10%; **significant at 5%; ***significant at 1%.

prevalent religious affiliation, and appropriately lagged) plus US immigrants attitudes towards women working and sex, Δimm_fework and Δimm_sex, as instruments, in addition to the appropriately lagged values of epr_w and $women\_cn$ (and of the additional regressors). Relative to the idiosyncratic component of the error term, gap, ben, ser_va, and $children$ are treated as endogenous, edu_w, tax_wedge, $udens$, and epl, as predetermined, and $pop65$ as exogenous. These additional endogenous and predetermined variables are instrumented using the same set of instruments that we use for $women\_cn$. Given the limited number of observations, we have constrained the coefficients of the first-stage regression to be equal across the three waves. For similar reasons, we have used only the shortest lag allowed for each variable as instrument, in order to keep the number of instruments under control relative to the number of observations and reduce the risk of overfitting.[38] $women\_cn$ now becomes a significant determinant of the evolution of female employment rates in all specifications. Another result of note is that there is substantial persistence in the evolution of epr_w, as suggested by the coefficient on the lagged dependent variable (around 0.8). Interestingly, labor market policies and structural variables are also significant determinants of the evolution over time of female employment rates. In our preferred parsimonious specification reported in columns (6) and (7), and obtained imposing restrictions on the more general specification of column (5), both employment protection legislation and the number of children have a significant negative effect (the coefficient on employment protection is significant at the 5% level). The negative link between changes in epl and changes in employment rates of women is consistent with the idea that strict systems of employment protection disproportionately protect the permanent jobs of prime-age males at the expense of outsiders who spend significant time out of work or shifting between temporary jobs (Kahn 2007). Indeed, women are more likely to be subject to entry problems in the labor market, and they are therefore likely to be disproportionately affected by the effects of EPL on firms' hiring decisions (OECD 2004).

The p-value of the Hansen–Sargan test of overidentifying restrictions (HS-pv in the table) is not suggestive of misspecification. However, the Arellano–Bond test of first-order serial correlation ($AB1z$) suggests that we cannot reject the hypothesis that the residuals (in difference) are white noise, which is consistent with the idiosyncratic shock in the equation in level being a random walk. If that were the case, lagged differences of predetermined or endogenous variables would not be legitimate instruments for the equation in levels and the use of the system estimator would be inappropriate in this case. For this reason, in Table 2 we also present a set of results obtained using the GMM difference estimator that does not suffer from this problem.[39] Column (8) contains the most general model and column (9)

---

38.   Note that the question necessary to construct $women\_cn$ (as well as $holidays$) was not asked in 2005, so we cannot add this wave to the sample. Moreover, but less importantly, even if the information were available, it may not add much to the variation of the attitudinal explanatory variables because it takes time for attitudes to change (this is one reason why we use 10-year intervals).

39.   In estimating the differenced model, if the difference of the error term was serially uncorrelated, we could advance all lagged instruments by one period. We have tried this, but with no improvement in

a more restricted parsimonious version. The coefficient of *women_cn* is significant (at levels between 1% and 10%). Among the policy and structure variables, employment protection and the number of children display a significant negative coefficient. The level of significance for the *epl* coefficient ranges between 5% and 1%. An increase in the share of output in the service sector is, instead, positively and significantly associated with higher employment rates for women.

Although no summary measure of the relevance of instruments for the endogenous variables has been developed for GMM panel data models, useful information is contained in the first-stage regressions. At the bottom of the table we report the *p*-value for the *F*-test of significance of the instruments (besides the period dummies) for *women_cn* in the first stage regressions for the model without policy/structure variables and for *women_cn* and *epl* for the most parsimonious specification of the model with policy/structure variables. Recall that there are two sets of first-stage regressions, one for the model in difference (3) and one for the model in levels (4). In both cases the instruments seem to have a degree of explanatory power for gender attitudes. The explanatory power is greater for the level equations (with *p*-values less than 0.001) and smaller for the difference equation (with *p*-values between 0.012 and 0.027). The latter fact may raise some concerns for the identification of the GMM difference model. The *p*-value for the first stage regression for *epl* and its change are 0.02 and 0.03 respectively.[40]

It thus appears that on the basis of both the system and difference GMM estimates, both attitudes and policies, in the form of employment protection, all play an important role in determining women employment rates.[41] This general conclusion holds if we do not rely on the standard error we derive from the asymptotic distribution but on the confidence intervals derived from bootstrapping the *t*-statistic. For our preferred specification in columns (6) and (8) we report the 95% bootstrapped confidence intervals in square brackets.[42] The conclusions concerning the role of attitudes and policies are essentially identical to those obtained from the standard errors based on the asymptotic distribution.

---

the results, so we have decided not to change the timing of the instruments. We have, however, excluded religious attitudes as an instrument because it contains no information about changes in attitude towards women working in the country of residence.

40.   The statistics and *p*-values have been calculated by allowing, in the first stage regressions, only for heteroskedasticity but no correlation in the errors across time for the same country. As it turns out, this provides conservative tests on the adequacy of the instruments. When we allow for such correlation, the *F*-statistics increase and their *p*-values decrease in such a degree as to raise doubt about the appropriateness of clustering by country in obtaining the covariance matrix of the first-stage regression, given the limited number of countries at our disposal.

41.   If we include childcare expenditure (and treat it as predetermined variable) its coefficients are never significant at the 5% level.

42.   The results presented in Tables 2 and 3 are based on block bootstrapping (given the panel data nature of the data, we sample countries, with replacement) with 5000 replications. It has been argued that bootstrapping methods based on an asymptotically pivotal statistic like the *t*-ratio usually have better properties than bootstrapping other statistics (Horowitz 2001). Whether they provide a better approximation to the small-sample distribution than the asymptotic approximations is an open question. See Poi (2004) for the implementation in Stata.

Note that both attitudes and policies are important quantitatively. Using the results in column (8), for instance, a change in our measure of attitudes from the first to the third quartile generates a change in female employment rates of 11.5 percentage points on impact, while a similar change in employment protection legislation results in an increase of 19.9 percentage points. One can also ask to what extent differences across countries in employment rates are due to those attitudes or policies that have a time varying component. For instance, in 2000 the female employment rate in the UK was 21.4 percentage points higher than in Italy: 9.1 percentage points are explained by differences in attitudes (more liberal in the UK) and 14.7 percentage point by differences in employment protection legislation (stricter in Italy).

In order to check for the robustness of our results to the choice of instruments, we have estimated the models in columns (6) and (8) in Table 2 using different sets of instruments: only internal instruments, internal instruments augmented only with deep attitudes, or only with the attitudes of immigrants to the US, or with both.[43] The outcome is that the coefficient of attitudes in the GMM system equation is more precisely estimated when deep attitudes are included in the instrument set (the attitudes of immigrants are less important), while the GMM difference equation requires the presence of immigrant attitudes in the instrument set (but not deep attitudes) to gain precision in estimating the effect of attitudes towards women working.

Finally, we have checked whether labor market attitudes could proxy for more general attitudes or personal traits such as trust, thrift, or perseverance. None of these variables, treated as endogenous, is a significant determinant of female employment rates at the 5% level, when added to column (6) or column (8) of Table 2 (only perseverance is significant at 10% level when added to column (6), and even then, the attitude towards women working remains significant). These results suggest that such more general attitudes can be excluded from the equations.[44]

In summary, the result that both policies and culture matter is fairly robust. There is, therefore, at least the potential for changes in policies to offset the effect of attitudes. Whether the required changes in policies are feasible is an issue we do not address in this paper. As we have already discussed, culture could affect outcomes indirectly, through the effect it has on policies and institutions.[45] For instance, societies characterized by a more traditional view of gender roles could set up policies and institutions to protect the male breadwinner model through employment protection legislation that is likely to be more beneficial for primary workers in formal sectors, the majority of whom are likely to be men. If this were the case our estimate of the effect of culture on female employment rates would capture only the direct effect of culture and would thus be downward biased.

---

43. The detailed results are reported in the Online Appendix in Table A.6.

44. See Table A.8 in the Online Appendix.

45. See Algan and Cahuc (2006) for a discussion of the effect of religious affiliation on employment protection and Alesina et al. (2010) on the relationship between the strength of family ties and labor market regulation.

In fact, if we look at the overall correlation coefficient between *women_cn* and *epl*, controlling for time dummies, it is (consistently with the previous discussion) negative (–0.4) and significant at the 1% level, when we use current *women_cn*, and negative (–0.38) and significant at 5%, when we use lagged *women_cn*. However, there is no information in the evolution over time of *women_cn* for the evolution in *epl* within countries (the correlation is not significantly different from zero, after introducing country fixed effects or running the regression in differences). All the correlation is cross-sectional.[46] Moreover, deeper attitudes or the attitudes of US immigrants do not matter in the first-stage regression of *epl*. Hence, there is no evidence of an indirect effect of changes in attitudes (or in their exogenous component) on women employment rates, through their effect on the evolution over time of labor market policies.

In Table 3 we present the GMM estimates for the (log) hours of work. We report only the GMM system estimates, because the Arellano–Bond test of first-order serial correlation suggests that the idiosyncratic component of the error term is not serially correlated in the level equation (and hence is $MA(1)$ in the difference equation). Considering the p-value of the F-test on the significance of instruments in the first-stage regression reported at the bottom of the table, it appears that instruments do have explanatory power for attitudes towards work. The explanatory power is greater for the level equations (with p-values less than .001) and somewhat smaller for the difference equation (with p-values between .017 and .036). The coefficient for the policy variables, taxes, and unemployment benefits, are identified only by the orthogonality conditions of the level equations.

The big difference relative to the Within estimates is that now the coefficient of *holidays* is negative and significant: considering holidays an important attribute of a job results in lower average hours of work. However, policies are also important. The policy variable more robustly associated with hours of work is the *tax-wedge*. *ben* also matters, but not as strongly (it is significant only at the 10% level in the last column). A wider tax wedge or more generous unemployment benefits lead to lower hours worked on average in a country. Using the results in column (6), for instance, an increase in the wedge from the first to the third quartile results in a decrease in hours worked of 6.6 percentage points on impact, while a similar increase in benefits results in a 1.4 percentage points drop. A change in attitudes towards generous holidays from the first to the third quartile leads to a 4.3 percentage points drop. These are sizable effects, particularly those for *tax-wedge* and *holidays* (recall that the difference from the first to the third quartile of hours is 14.3 percentage points). The results suggest that, for instance in 2000, if tax wedge and unemployment benefits had been the same in Spain as they were in that year in the UK, hours worked would have been higher in Spain by 2.9 percentage points.[47] Union density is also significantly and positively

---

46.   Alesina et al. (2010), using a larger set of countries, also find a positive cross-sectional correlation between cultural attitudes (importance of family ties, both actual and inherited) and various measures of labor market regulation. Using micro data they also find a positive correlation between family ties and the desire for employment protection, whether or not one includes country fixed effects.

47.   This in a situation where, contrary to attitudes toward women's employment, attitudes toward hard work are similar in the two countries.

TABLE 3. Family and work attitudes and log average annual hours: GMM system estimates.

	(1) hours	(2) hours	(3) hours	(4) hours	(5) hours	(6) hours
holidays	-0.0522*** (0.0183)	-0.0477** (0.0216)	-0.0398 (0.0274)	-0.0497 (0.0331)	-0.0605** (0.0298)	-0.0666** (0.0270) [-.23, 0.08]
l_hours	0.990*** (0.0990)	1.005*** (0.101)	0.995*** (0.116)	0.872*** (0.0959)	0.897*** (0.0841)	0.912*** (0.0925) [.42,1.28]
gap		-0.00162 (0.00469)	-0.00278 (0.00415)	-0.00346 (0.00452)	-0.000871 (0.00293)	
serv_va			0.000512 (0.00204)		0.00407** (0.00166)	0.00512*** (0.00192) [-.010,.015]
epr_w			-0.000408 (0.000720)		-0.00142*** (0.000488)	-0.00208*** (0.000775) [-.005, .0005]
tax_wedge				-0.00224 (0.00166)	-0.00312* (0.00155)	-0.00403*** (0.00143) [-.001,.003]
epl				-0.00197 (0.00702)	-0.00217 (0.00616)	
udens				0.000969** (0.000412)	0.00164*** (0.000424)	0.00214*** (0.000432) [-.0051,0.0004]
benall				-0.000819 (0.000594)	-0.00119*** (0.000389)	-0.000843* (0.000482) [.001,.005]
Observations	36	36	36	36	36	36
AR(1)z-stat	-1.830	-1.528	-1.590	-1.212	-1.881	-1.827
Hansen-Pvalue	0.587	0.746	0.960	0.962	1.000	0.932

Continued

TABLE 3. Continued.

	(1) hours	(2) hours	(3) hours	(4) hours	(5) hours	(6) hours
First Stage (col 1)	holidays	F = 36.92 {.000}	d.holidays	F = 4.05{.017}		
First Stage (col 6)	holidays	F = 30.11 {.000}	d.holidays	F = 3.52{.036}		
	tax_wedge	F = 36.20 {.000}	d.tax_wedge	F = 1.84{.174}		
	ben	F = 9.78 {.001}	d.ben	F = 0.88{.581}		
First Stage (col 6, internal IVs only)	holidays	F = 6.78 {.002}	d.holidays	F = 6.08{.003}		
	tax_wedge	F = 4.37 {.009}	d.tax_wedge	F = 1.45{.262}		
	ben	F = 2.91 {.042}	d.ben	F = 1.42{.271}		

Notes: Standard errors in parentheses. Period effects are entered in every columns. In all columns except column (6) religious attitudes of the country of residence (treated as predeterminate) and attitudes towards trust and sex of American immigrants (treated as exogenous) are used as instruments in addition to lagged hours and holidays. In column (6) only religious attitudes are used as instruments in addition to lagged hours and holidays. For all variables only the shortest allowable lagged is used as instrument. gap, benall, serv_va, epr_w treated as endogenous, tax_wed, udens and epl as predeterminate. AR(1)z: Arelanno and Bond (1999) test of first-order serial correlation, distributed as $(N(0,1))$. HansPv: p-value of Hansen test of overidentifying restrictions. F denotes the F-test of significance of the instruments (besides the period dummies) in the first-stage regressions for selected variables (in levels or differences). p-value in curly brackets.
*Significant at 10%; **significant at 5%; ***significant at 1%.

associated with average hours, which is consistent with the opposition of unions to part-time work. Finally, as for the Within estimates, a higher fraction of women in the labor force is negatively associated with hours of work, while the association with the relative size of the service sector is positive. The bottom line is that in the case of hours worked too, both policies and attitudes matter.[48]

When we experiment with different subsets of instruments, the results suggest that the inclusion of attitudes of American immigrants or religious beliefs of residents as instruments sharpens the precision of the coefficient on attitudes towards leisure and on policies.[49] Contrary to the equation for the female employment rate, the bootstrapped confidence intervals for culture, policies, and structure are quite wide (they do not include zero only for the lagged dependent variable). However, as observed in footnote 42, there is no guarantee that bootstrapping provides more accurate inference than the standard errors based on the asymptotic distribution.

Also in this case there is no evidence that contemporaneous or past changes in attitudes (*holidays*) are correlated with changes in policies (*tax_wedge* and *ben*). Interestingly, in the first-stage regression for $\Delta tax\text{-}wedge$, there is information in some of the cultural instruments (such as *god* for *tax_wedge*). In this case, an evolution in deep attitudes has an effect on hours worked both through attitudes towards leisure and through policies. However, provided there are exogenous components in policy choices that are unrelated to attitudes, one can still consider how policies can be used to affect labor market outcomes independently of attitudes.[50]

6.2. Some Regional Results

In Table 4 we report some results on the effect of cultural attitudes on female employment rates based on observations at the region-wave level. The advantage of using regional data is that we can increase the number of cross-sectional units available for estimation. We have collected regional data from Eurostat and we have been able to match them with the World Value Service data for 43 European regions. A disadvantage is that no homogeneous data are available for periods earlier than the beginning of the 1980s, so that in a model with the lagged dependent variable

---

48. The general conclusion obtained from the GMM estimates about the determinants of average hours worked also holds when we use average attitudes towards leisure, as opposed to the country-specific period effects (see the discussion in Section 2, as an explanatory variable. Using average gender attitudes, the results for female employment rates would be similar in terms of sign and significance for the GMM system estimator, but would be much more imprecise for the GMM difference estimator. Neither average attitudes towards women working nor towards leisure are significantly associated with labor market outcomes when we use the Within estimator.

49. See Table A.7 in the Online Appendix for details.

50. Finally, we have also experimented with including a human capital variable (average years of education of those older than 25 years of age from Barro and Lee (2001) as a regressor instead of *epr_w*. The results are reported in Table A.9. Our essential results hold (see the last column of Table A.9). The coefficient of the education variable is significant at the 10% level. The coefficient on the policy variables remain significant (actually the one for unemployment benefits becomes more significant) and their magnitudes are very similar. The coefficient on the attitudinal variable is now significant at the 10% level (instead of 5% as in column (6) of Table 3) but the coefficient remains similar.

TABLE 4. Family and work attitudes and employment rates for women: Estimates for European regions.

	(1) epr_w	(2) epr_w	(3) epr_w	(4) epr_w	(5) epr_w	(6) epr_w	(7) epr_w	(8) epr_w
women_cn	3.269*	4.702*	−0.541	0.381	3.604*	3.731**	−0.454	1.983
	(1.812)	(2.569)	(1.191)	(1.216)	(2.036)	(1.544)	(2.670)	(2.020)
l_epr_w					0.904***	0.909***	0.796**	−0.0143
					(0.109)	(0.109)	(0.323)	(0.646)
Observations	101	101	101	101	43	43	43	43
HansPv					0.458	0.922	0.179	0.455
F1		17.85 [.000]		31.48 [.000]	5.60 [.001]	12.27 [.000]	10.86 [.054]	15.73 [.008]
F2							2.19 [.092]	3.36 [.021]

Notes: Standard errors in parentheses; in columns (1)–(4) they allow for heteroskedasticity and correlation within each region. Period effects are entered in every columns. Column 1 reports the OLS estimator when country effects are included. Column (2) adds country-period effects. Column (3) reports the Within estimator. Column (4) adds country-period effects. Column (5) reports the difference estimator results using religious beliefs (treated as predeterminate) as instruments in addition to the appropriately lagged values of the regressors. Column (6) reports the difference estimator results using intensities of religious attendance (treated as predeterminate) as instruments in addition to the appropriately lagged values of the regressors. Column (7) and (8) add country-period effects to column (5) and (6) respectively. For all variables only the shortest allowable lagged is used as instrument. HansPv: p-value of Hansen test of overidentifying restrictions. F1 denotes the F-test for the equality of coefficients of the country-wave dummies. F2 denotes the F-test of significance of the instruments (besides the period or country-period dummies) in the first stage regressions for selected variables (in levels or differences). p-value in square brackets.
Significant at 10%; **significant at 5%; ***significant at 1%.

we have only one cross-section available for estimation of the model in differences. In the first two columns we present the OLS estimates controlling first for country effects and common period dummies, and then for country-specific period dummies. In both cases *women_cn* is significant at the 10% level. In columns (3) and (4) we report the fixed effects estimates. As in the case of the Within estimates on country-level data, the coefficients of attitudes towards women working are not significant at conventional levels. In the next two columns we report the GMM difference estimates of the dynamic model, with either belief in God (*god*) or the intensity of religious practice (*week*) as additional instruments, with common year dummies. In this case the coefficient of *women_cn* is significant at the 10% and 5% level respectively (perhaps reflecting the fact that *week* is more informative than *god* for *women_cn*, as suggested by the first-stage regressions). As in the case of the country-level data, the lagged female employment rate is very significant with a coefficient of around 0.9. When we add year-country dummies, culture becomes insignificant and there are serious doubts on the informativeness of the instruments. The introduction of country-specific wave dummies controls for country-specific policies and structure, but it also controls for the component of culture that varies over time in the same way for all regions in a country. The data suggest that it is very difficult to identify the effect of regional specificity in the evolution of culture on the regional employment rate of women. More work is needed at the regional level before a definitive conclusion can be reached. At a minimum, these results and the previous seminal work by Tabellini (2010) suggest that it is worth pursuing the research at the regional level.

7. Conclusions

We have studied whether cultural attitudes towards work, gender, and the young are a significant determinant of the evolution over time of the employment rates of women and of the young, and of hours worked in OECD countries. Beyond controlling for a larger menu of policies, institutions, and other structural characteristics of the economy than has been done so far, our analysis attempts to improve upon existing studies of the role of 'culture' on economic outcomes by dealing explicitly with the endogeneity of attitudes, policies, and institutions, and by allowing for the persistent nature of labor market outcomes.

The availability of panel data helps us in assessing the effect of attitudes, policies, and institutions on labor market outcomes. If we assume that the time-varying and the time-invariant components of attitudes and policies have identical effects, we can identify the effect of attitudes and policies tout court. If instead the two components have different effects on outcomes, what we have estimated is just the effect of the time-varying components.

We find that, even after instrumenting, allowing for persistence of outcomes and for an extensive menu of additional controls, culture matters. More specifically, attitudes towards a woman's role in the family and towards leisure are statistically and economically important determinants of the employment rate of women and of average

hours worked, respectively. However, we find that policies and other institutional or structural characteristics also matter. The results on the role of attitudes towards leisure, and of policies and institutions in determining the evolution over time of hours worked, are new and particularly interesting in the light of the debate initiated by Prescott (2004) and Alesina, Glaeser, and Sacerdote (2005).

In the case of female employment rates, the policy variable that is significant, along with attitudes, is the OECD index of employment protection legislation. For hours worked, the policy variable that more clearly plays a role, along with attitudes, is the tax wedge. The quantitative impact of these policy variables is large.

In our work we have used deeper attitudes in the country of residence and the attitudes of US immigrants, grouped by country of origin, as additional instruments. Other instruments could be investigated in future work. For instance, following Giuliano (2007), the living arrangements of American immigrants could be used as an instrument for attitudes toward the young. An additional strategy to identify the effect of culture would be to compare the labor market outcomes for immigrants from different countries who live in the same area. Further explorations with regional data may also be helpful, since we have just scratched the surface in this regard. All this is on our research agenda for the future.

References

Aghion, Philippe, Yann Algan, and Pierre Cahuc (2011). "Civil Society and the State: The Interplay Between Cooperation and Minimum Wage Regulation." *Journal of the European Economic Association*, 9, 3–42.

Alesina, Alberto, Yann Algan, Pierre Cahuc, and Paola Giuliano (2010). "Family Values and the Regulation of Labor." NBER Working Paper No. 15747.

Alesina, Alberto and Paola Giuliano (2010). "The Power of the Family." *Journal of Economic Growth*, 15, 93–125.

Alesina, Alberto, Edward Glaeser, and Bruce Sacerdote (2005). "Work and Leisure in the U.S. and Europe: Why So Different?" *NBER Macroeconomic Annual 2005*, 1–64.

Alesina, Alberto and Edward Glaeser (2004). *Fighting Poverty in the US and Europe: A World of Difference*. Oxford University Press.

Alesina, Alberto and Eliana La Ferrara (2002). "Who Trusts Others?" *Journal of Public Economics*, 85, 207–234.

Algan, Yann and Pierre Cahuc (2006). "Job Protection: the Macho Hypothesis." *Oxford Review of Economic Policy*, 22, 290–410.

Algan, Yann and Pierre Cahuc (2007). "The Roots of Low European Employment: Family Culture?" In *NBER International Seminar on Macroeconomics 2005*, edited by C. Pissarides and J. Frenkel. MIT Press, pp. 65–109.

Algan, Yann and Pierre Cahuc (2010). "Inherited Trust and Growth." *American Economic Review*, 100, 2060–2092.

Antecol, Heather (2000). "An Examination of Cross-Country Differences in the Gender Gap in Labor Force Participation Rates." *Labour Economics*, 7, 409–426.

Archimandrite, C. (1981). "Women in the Orthodox Church." *Orthodox Life*, 31, 34–41.

Arellano, Manuel and Stephen Bond (1991). "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *Review of Economic Studies*, 58, 277–297.

Barro, Robert and Rachel McCleary (2004). "Religion and Economic Growth." *Milken Institute Review*, April.

Barro, Robert and J-W. Lee (2001). "International Data on Educational Attainment Updates and Implications." *Oxford Economic Papers*, 53, 541–563.

Bassanini, Andrea and Romain Duval (2006). "Employment Patterns in OECD Countries: Reassessing the Role of Policies and Institutions." OECD Economics Department Working Paper No. 486.

Bisin, Alberto and Thierry Verdier (2001). "The Economics of Cultural Transmission and the Evolution of Preferences." *Journal of Economic Theory*, 97, 298–319.

Blundell, Richard and Stephen Bond (1998). "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models." *Journal of Econometrics*, 87, 11–143.

Brugger, Beatrix, Rafael Lalive, and Josef Zweimuller (2010). "Does Culture Affect Unemployment? Evidence from the Rostigraben." IZA Discussion Paper No. 4283.

Doepke, Matthias and Fabrizio Zilibotti (2008). "Occupational Choice and the Spirit of Capitalism." *Quarterly Journal of Economics*, 123, 747–793.

Farré, Lidia and Francis Vella (2007). "The Intergenerational Transmission of Gender Role Attitudes and its Implications for Female Labor Force Participation." IZA Discussion Paper No. 2802.

Fernàndez, Raquel (2007). "Women, Work and Culture." *Journal of the European Economic Association*, 5, 305–332.

Fernàndez, Raquel (2008). "Culture as Learning: The Evolution of Female Labor Force Participation over a Century." Working paper, NYU.

Fernàndez, Raquel, Alessandra Fogli, and Claudia Olivetti (2004). "Mothers and Sons: Preference Formation and Female Labor Force Dynamics." *Quarterly Journal of Economics*, 119, 1249–299.

Fernàndez, Raquel and Alessandra Fogli (2009). "Culture: An Empirical Investigation of Beliefs, Work and Fertility." *American Economic Journal: Macroeconomics*, 1, 146–177.

Fogli, Alessandra and Laura Veldkamp (2007). "Nature or Nurture? Learning and Female Labor Force Dynamics." Federal Reserve Bank of Minneapolis Staff Report No. 386.

Fortin, Nicole (2005). "Gender Role Attitudes and Women's Labour Market Outcomes Across OECD Countries." *Oxford Review of Economic Policy*, 21, 416–438.

Fortin, Nicole (2009). "Gender Role Attitudes and Women's Labor Market Participation: Opting-Out, AIDS, and the Persistent Appeal of Housewifery." Working paper, University of British Columbia.

Giuliano, Paola (2007). "Living Arrangements in Western Europe: Does Cultural Origin Matter?" *Journal of the European Economic Association*, 5, 927–952.

Griliches, Zvi and Jerry A. Hausman (1986). "Errors in Variables in Panel Data." *Journal of Econometrics*, 31, 93–118.

Gruber, Jonathan and Daniel Hungerman (2008). "The Church Versus the Mall: What Happens When Religion Faces Increased Secular Competition?" *Quarterly Journal of Economics*, 123, 831–862.

Guiso, Luigi, Paola Sapienza, and Luigi Zingales (2003). "People's Opium? Religion and Economic Attitudes." *Journal of Monetary Economics*, 50, 225–282.

Guiso, Luigi, Paola Sapienza, and Luigi Zingales (2006). "Does Culture Affect Economic Outcomes?" *Journal of Economic Perspectives*, 2, 23–48.

Horowitz, Joel L. (2001). "The Bootstrap." In *Handbook of Econometrics*, Vol. 5, edited by J. J. Heckman and E. Leamer. North-Holland, pp. 3159–3228.

Kahn, Lawrence M. (2007). "The Impact of Employment Protection Mandates on Demographic Temporary Employment Patterns: International Microeconomic Evidence." *Economic Journal*, 117, 333–356.

Licht, Amir, Chanan Goldschmidt, and Shalom H. Schwartz (2007). "Culture Rules: The Foundations of the Rule of Law and Other Norms of Governance." *Journal of Comparative Economics*, 35, 659–688.

Nickell, S. (1981). "Biases in Dynamic Models with Fixed Effects." *Econometrica*, 49, 1417–1426.

Nickell, Stephen, L. Nunziata, and W. Ochel (2005). "Unemployment in the OECD Since the 1960s: What Do We Know?" *Economic Journal*, 115, 1–27.

OECD (2004). *Employment Outlook*. OECD.

Poi, Brian (2004). "From the Help Desk: Some Bootstrapping Techniques." *Stata Journal*, 4, 312–328.

Prescott, Edward (2004). "Why Do Americans Work so Much More than Europeans?." *Federal Reserve Bank of Minneapolis—Quarterly Review*, 28, 2–13.

Roodman, David (2006). "How to Do xtabond2: An Introduction to 'Difference' and 'System' GMM in Stata." Working Paper No. 103, Center for Global Development, Washington, DC.

Soto, Marcelo (2010). "System GMM Estimation With A Small Sample." Working paper, Instituto de Analisis Economico, Barcellona.

Stutzer, Alois and Rafael Lalive (2004). "The Role of Social Work Norms in Job Searching and Subjective Well-Being." *Journal of the European Economic Association*, 2, 686–719.

Tabellini, Guido (2008a). "The Scope of Cooperation: Values and Incentives." *The Quarterly Journal of Economics*, 123, 905–950.

Tabellini, Guido (2010). "Institutions and Culture." *Journal of the European Economic Association Papers and Proceedings*, 6, 2–3.

Tabellini, Guido (2010). "Culture and Institutions: Economic Development in the Regions of Europe." *Journal of the European Economic Association*, 8, 677–716.

Weber, Max (1930). *The Protestant Ethic and the Spirit of Capitalism*. Allen and Unwin.

Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's website:

Online Appendix: Data Description and Additional Tables