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The Sources of Declining European and Italian Fertility, 1960-2008: An Empirical Analysis

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Abstract

This paper has two aims: (i) to understand the covariates associated with fertility decline in Western Europe since 1960, and (ii) to determine more specifically those factors associated with the extremely low total fertility rate levels in Southern Europe, particularly Italy. To do this, a panel of 17 countries covering the period 1960-2008 is analyzed, and multivariate regression analysis of this panel is assessed and interpreted. To assess how and why fertility has changed in western Europe in the last 50 years, I present a variety of multivariate analyses, most for the entire 17-country sample, applying long-panel methods--Prais-Winsten regressions--as outlined by Cameron and Trivedi (2010). Furthermore, given the focus on differential fertility decline in Italy and other 'similar' countries, results of different specifications are presented to assess sensitivity.

Keywords: Fertility, Italy, Europe

1. Introduction and background

Fertility decline in the 20th century is a common phenomenon in developed and also many developing countries. While at least modest declines have been observed for many western European nations, a particular puzzle is the transition to extremely low fertility among the subset of Southern European countries: Italy, Spain, Greece, Portugal. To illustrate, in 2008 the mean (population-unadjusted) total fertility rate (TFR) among the 17 Western European countries analyzed in this paper was 1.66, but substantially lower in Italy (1.30), Spain (1.46), Greece (1.36), and Portugal (1.49).

Hence, this paper has two aims: (i) to understand the covariates associated with fertility decline in Western Europe since 1960, and (ii) to determine more specifically those factors associated with the extremely low TFR levels in Southern Europe, particularly Italy. To do this, a panel of 17 countries covering the period 1960-2008 is analyzed, and multivariate regression

analysis of this panel is assessed and interpreted. Details of the data are found in Section 2, while results of the analysis are contained in Section 3.

In his edited volume *Europe's Population in the 1990s*, David Coleman observed that at that time (1996), convincing and comprehensive statistical evidence was largely lacking regarding the underlying determinants of European fertility and changes in it. One unresolved issue is the simple relationship between women's labor-force participation and TFR. A number of people, including Coleman (2005), have pointed out that, at the country level, the simple correlation between women's LFP and TFR was significantly negative around 1970, but by the mid-1990s had become significantly positive. A variety of attempts to explain this temporal reversal have been proposed, including systematic differences in labor-market institutions between Southern Europe and other OECD countries (Adsera, 2004), including such features as individual vs. joint taxation of income and whether child care is supported by direct provision or by payments to families (Apps and Rees, 2004).

The cost of children is directly examined by Diprete et al. (2003) as a determinant of TFR in an analysis of 5 countries (Denmark, Germany, Italy, UK, and US) in the 1990s. They document considerable heterogeneity among these countries in the forgone-income cost from childbearing, as well as in the impact of childbearing on living standards (incorporating child-care costs). Comparing the ranking of these 5 countries in terms of these differing cost measures, they casually observe there to be some degree of negative correlation between childbearing costs and TFR although they do not produce econometric estimates corresponding to these correlations.

Other literature attempts to analyze systematically the contribution of various public-policy instruments to changes in TFR. This literature was summarized fairly recently by Gauthier (2007), who evaluated 3 broad categories of evidence: macro-level analyses relating cash benefits as well broader indices of family policy to TFR; analogous micro-level analyses; and micro-level analyses relating policies pertaining to families and work (parental leave, childcare, etc.) to TFR. Summarizing the evidence from approximately three dozen papers, Gauthier concludes that there is fairly robust evidence from this group of studies for fertility-increasing effects of policy, albeit small effects.

Finally, a fairly extensive literature considers the explanations for low fertility in Italy per se. Castiglioni et al. (2001) detect a significant decrease between 1970 and 1995 in planned pregnancies in Italy relative to France (and the US). A variety of potential factors differentially reducing Italian fertility are identified by De Sandre (2000) in his interpretation of sequential international surveys in 1979 and 1996. Among these are: increased age at first sexual activity, increased use of contraception, delayed age of marriage, and the later age of home-leaving by adult children, although differential effects for Italy are suggested rather than explicitly estimated. Finally, substantial recent decreases in fertility in both Italy and Spain are suggested to be associated with expanded access to abortion and contraception (Delgado Perez and Livi-Bacci, 1992).

2. Data and empirical model

Analysis of the changes in European and Italian fertility since 1960 use the excellent panel data set compiled by Gauthier (2010), the Comparative Family Policy Database (CFPD). The CFPD draws from country-level data (principally from the OECD) covering the period 1960-2008. The empirical model estimated is:

$$TFR_{it} = \alpha_{it} + \beta_{it} X_{it} + \varepsilon_{it},$$

where i denotes the 17 Western European countries[1] contained in the CFPD.

The dependent variable, TFR_{it}, is the total fertility rate drawn from the OECD Health Data 2009 (2009): "the average number of children a woman would have if she lived to the end of her childbearing years (conventionally considered to be 15-44 but sometimes 15-49) and bore children at the prevailing rate for each age during that period."

Covariates are primarily also extracted from the CFPD, with the exception of data on divorce laws, which comes from Gonzalez and Viitanen (2009). These CFPD covariates are: infant mortality lagged 1 year (INF_MORT), the ratio of female to male wages (WAGE_RATIO), the female labor-force participation rate (LFP_F), the total expenditures on family allowances as a percentage of GDP ($ALLOW_1$, covering 1960-1996, and $ALLOW_2$, covering 1980-2005), the percentage of the labor force in agriculture (AGRIC), and the unemployment rate (UNEMP). As for divorce law (DIV_LAW_j), two country-level classifications found in Gonzalez and Viitanen are used: "unilateral" divorce allowed (j = U) and no-fault divorce allowed (j = N). For a given country-year, DIV_LAW_U = 1 if divorce without mutual spousal consent was allowed, while DIV_LAW_N = 1 if divorce could be granted based on non-fault-based ground such as "irretrievable breakdown" (although this sometimes required mutual spousal consent). Table 1 reproduces a portion of a similar table from Gonzalez and Viitanen, noting the years in which each type of divorce-law change occurred in each country.

Summary statistics for TFR and the covariates are provided in Table 2. INF_MORT expresses the number of deaths occurring prior to age 1, per 1000 live births, with the mean value of this for this sample 13.1 reflecting variation from a minimum of 1.8 to a maximum of 88.8. Women, on average, participate in the labor force at a rate of 54.2 percent, and earn a wage on average that is 74.2 percent of the male wage (although exceeding the male wage by as much as 12.3 percent in one observation). As expected for this time period, the average country has a relatively low fraction of the workforce in agriculture (11.2 percent), although this also conceals some substantial variation (with a maximum of 57.1 percent). The average unemployment rate is 5.46 percent, with a maximum of 24.2 percent. Family allowance spending as a percentage of GDP is slightly more than 1 percent (1.35 percent for $ALLOW_1$ and 1.41 percent for $ALLOW_2$). Finally, countries in the sample were covered by "unilateral" divorce law in 63.2 percent of years, and by no-fault divorce in 82.9 percent of years.

[1] These countries, with their two-letter postal abbreviations in parentheses are: Austria (AT), Belgium (BE), Denmark (DK), Finland (FI), France (FR), Germany (DE), Greece (GR), Ireland (IE), Italy (IT), Luxembourg (LU), Netherlands (NL), Norway (NO), Portugal (PT), Spain (ES), Sweden (SE), Switzerland (CH), United Kingdom (UK).

Table 1: Initial year of divorce law changes

	Unilateral	No-fault
Austria (AT)	1978	pre-1950
Belgium (BE)	1975	pre-1950
Denmark (DK)	1970	pre-1950
Finland (FI)	pre-1950	pre-1950
France (FR)	1976	1976
Germany (DE)	1977	pre-1950
Greece (GR)	1983	1979
Ireland (IE)	----	1997
Italy (IT)	----	1975
Luxembourg (LU)	1979	pre-1950
Netherlands (NL)	1971	1971
Norway (NO)	pre-1950	pre-1950
Portugal (PT)	1976	1976
Spain (ES)	1981	1981
Sweden (SE)	pre-1950	pre-1950
Switzerland (CH)	2000	pre-1950
United Kingdom (UK)	1971	1971

Source: Gonzalez and Viitanen (2009).

Table 2: Summary statistics

	Mean	Standard Deviation	Minimum	Maximum
TFR	1.94	.56	1.16	4.06
INF_MORT	13.08	11.04	1.8	88.8
WAGE_RATIO	.74	.09	.54	1.12
LFP_F	54.21	14.62	18.4	96.5
$ALLOW_1$ (1960-1996)	1.34	.98	0	5.61
$ALLOW_2$ (1980-2008)	1.41	.68	.13	3.3
AGRIC	11.23	10.05	1.3	57.1
UNEMP	5.46	4.23	0	24.2
DIV_LAW_U	.63	.48	0	1
DIV_LAW_N	.83	.38	0	1

3. Empirical results

To assess how and why fertility has changed in western Europe in the last 50 years, I present a variety of multivariate analyses, most for the entire 17-country sample. Because the dataset contains fewer units of observation (17 countries) than it does year per observation (25-30 years depending on the specification), it is informative to apply long-panel methods—Prais-Winsten regressions—as outlined by Cameron and Trivedi (2010). Furthermore, given the focus on differential fertility decline in Italy and other 'similar' countries, results of different specifications are presented to assess sensitivity.

The first set of regressions assumes the absence of group-level differences among the countries, an assumption that will soon be relaxed. Table 3 contains the results of 8 alternative specifications of this first model, all of which include country-level fixed effects. The 4 alternative specifications reflect varying combinations of: (i) 2 different family-allowance measures (ALLOW1 and ALLOW2), (ii) 2 different divorce-law measures (UNILATERAL and NOFAULT), and (iii) 2 different assumptions about autocorrelation structure (panel-specfic AR(1), i.e., PSAR1 and AR(1) common across panels, i.e., CAR1).

The panel-specific AR(1) results are presented in the first 4 columns of Table 3, given the presumption that it is less restrictive to permit panel-specific autocorrelation than to restrict the data to follow a process which is common across panels. In these 4 panel-specific AR(1) results in the first 4 columns of Table 3, some robust and plausible results appear to emerge. Specifically, annual country-level TFR is positively associated with INF_MORT (lagged one year) and also with the generosity of family allowance payments (defined either as ALLOW1 or ALLOW2). Conversely, TFR is negatively associated with UNEMP and with both forms of no-fault DIV_LAW (although the coefficient in specification (4) is only significant at 10 percent). Other covariates are less consistent in indicating significance across these 4 PSAR1 specifications, although they do exhibit coefficients consistent with rational fertility choice. In particular, higher participation in AGRIC is associated with higher TFR in 3 out of the 4 PSAR1 regressions, while the WAGE_RATIO and LFP_F covariates are negatively significant in only a few of these 4 regressions. Finally, the results suggest that there is a nonmonotonic time trend, although its composition varies across these 4 regressions.

When the model is restricted to require common AR(1) processes across countries, the pattern of results is largely unaffected. Again, TFR exhibits robust positive variation with INF_MORT and both family allowance measures (ALLOW1, ALLOW2), with less consistent positive coefficients found for AGRIC. In addition, the CAR1 results (as in the PSAR1 results) reflect a consistent negative association of both UNEMP and DIV_LAW with TFR, with inconsistently significant negative coefficients found for the labor-market measures WAGE_RATIO and LFP_F.

Because a principal interest in this paper is to assess how Italy (and similar) countries differ in their fertility response to economic change since 1960, this initial model is expanded to consider the possibility that responses to change are region- or country-specific. The analysis thus far assumes common coefficients for all countries. However, demographers have noted particularly low levels of fertility for a southern European subset of these countries: Italy, Spain,

Greece, and Portugal. Besides geography, two criteria characterize this group: (1) very low current fertility, and (2) high fertility at the end of the 19th century. In other words, these were not all high-fertility countries at the beginning of the sample frame defined by the Gauthier data, 1960. Nevertheless, in order to understand the longer-term dramatic decline in fertility in these countries over the last 100 years and more, analysis of whether they exhibit differential behavior over the last 50 may be instructive. Accordingly, the models previously estimated in a common-coefficients framework are re-estimated to permit group-level heterogeneity—between 'southern Europe' and the rest of Europe—in marginal effects. The estimates from these models, presented in Table 4, therefore contain a full set of terms that interact the standard regressors with a "Southern Europe" fixed effect.

Hence, Table 4 presents the results of Prais-Winsten regressions with panel-corrected standard errors for the same 8 alternative specifications (2-by-2 combinations of family-allowance and divorce-law regressors, with PSAR(1) and CAR(1), respectively), but with each regression augmented by a full set of interaction terms. These interaction terms capture whether the countries of Southern Europe (Italy, Spain, Greece, Portugal) differ, as a group, from the rest of the sample in the marginal effects of the 9 covariates (YEAR, YEAR^2, INF_MORT, WAGE_RATIO, LFP_F, family allowance generosity (ALLOW1 or ALLOW2), AGRIC, UNEMP, and DIV_LAW).

The first four columns in Table 4—regressions (1_S), (2_S), (3_S), and (4_S)—contain the results of this model with full Southern Europe interactions assuming panel-specific AR(1). Consider first the main effects reported in Table 4. These main effects are highly consistent with the main effects found in the restricted (no-interactions) models in the first 4 columns of Table 3. Again, TFR varies positively with lagged INF_MORT and family allowance generosity, results robust to the use of either family-allowance measure and either DIV_LAW measure. As well, in regressions (3_S) and (4_S), which use ALLOW2 to measure family-allowance generosity, AGRIC is positively associated with TFR. As well, the general pattern of negative main-effect coefficients found in Table 3 is repeated in Table 4. That is, TFR varies negatively with UNEMP in all 4 PSAR(1) specifications in Table 4, with negative coefficients on: DIV_LAW in 3 out of 4 PSAR(1) regression in Table, and on WAGE_RATIO in 2 out of 4. Finally, regressions (1_S) and (2_S) indicate a nonmonotonic time trend.

Turning to the Southern-Europe interaction terms, the majority of these are insignificant although a few patterns are suggested across regressions (1_S)-(4_S). In particular, higher shares in AGRIC in Southern Europe have a dampened association with TFR. Otherwise, there are scattered interactions that are significant at the 10 percent (but not 5 percent) level, although the WAGE_RATIO interaction term is significant and positive in regression (2_S). When the autocorrelation process is instead assumed to be common across panels (in regressions (5_S)-(8_S)), the pattern of signs remains similar, with a few more of them significant at the 5 percent level. Despite the fairly limited significance for these Southern-Europe interaction terms, F tests for their joint significance were significant at the 1 percent level, implying that we can reject the hypothesis that all of these coefficients are identically zero.

Given the specific interest in differential fertility change in Italy (and the frequency of joint significance for the Southern Europe interaction terms), the model can be specified to

assess if Italy itself significantly differs from other western European countries during this time period. Table 5 thus presents the results of Prais-Winsten regressions (with corrected standard errors), with the 8 specifications in Table 5 analogous to those in Table 4 (except with the dichotomous indicator now being 1 for Italy and 0 for non-Italy). To begin with, we can consider the main effects from these 8 regressions in Table 5. Reassuringly, these coefficients are largely robust to this redefinition of the dummy variable. As before, TFR is found to vary positively with lagged INF_MORT, family allowance generosity (defined as ALLOW1 or ALLOW2), and AGRIC. Moreover, the coefficients on INF_MORT and AGRIC are significant almost across the board, unlike for the Southern Europe model in Table 4, where INF_MORT was insignificant in 1 of the 8 specifications, and AGRIC was insignificant in 3 of the 8.

A similar pattern is found for those covariates with estimated negative coefficients. Specifically, higher UNEMP is associated with lower TFR in all 8 specifications in Table 5, and the presence of no-fault divorce (DIV_LAW = 1) is negatively associated with TFR in 7 of the 8 specifications (compared to only 4 instances in Table 4). As well, the WAGE_RATIO was found to be a negative covariate of TFR in the 2 specifications in Table 5 compared to 4 such instances in Table 4, while LFPF was significant in 3 instances (compared with only 1 in Table 4).

Given the redefinition (to IT = 1) of the interaction terms in Table 5, it is not surprising that there is some inconsistency between these results and those in Table 4 (where the interactions were defined for the group of 4 Southern European countries). Once the focus is specifically on Italy in Table 5, the INF_MORT interaction term is positive in 4 out of 8 specifications, while never reaching significance in Table 4.

Table 3: Prais-Winsten regression coefficients, no interaction terms (panel-corrected p-values in parentheses)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
YEAR	.019 (<.001)	-2.30 (.003)	-.009 (.001)	-.009 (<.001)	-2.27 (.012)	-2.45 (.014)	-.010 (<.001)	-.010 (<.001)
$YEAR^2$	$-9.03e^{-6}$ (<.001)	.0006 (.004)	$4.63e^{-6}$ (<.001)	$5.29e^{-6}$ (<.001)	.0006 (.012)	.0006 (.015)	$5.42e^{-6}$ (<.001)	$5.33e^{-6}$ (<.001)
INF_MORT_{t-1}	.008 (<.001)	.006 (.001)	.022 (<.001)	.022 (<.001)	.005 (.014)	.005 (.019)	.023 (<.001)	.023 (<.001)
WAGE_RATIO	-.674 (.014)	-.394 (.129)	.105 (.458)	.076 (.587)	-.527 (.046)	-.538 (.044)	.059 (.678)	.030 (.827)
LFP_F	-.002 (.394)	-.002 (.331)	-.003 (.070)	-.004 (.019)	-.002 (.352)	-.002 (.313)	-.004 (.030)	-.004 (.023)
$ALLOW_j$	.063 (<.001)	.053 (<.001)	.101 (<.001)	.103 (<.001)	.044 (<.001)	.042 (.001)	.084 (<.001)	.087 (<.001)
AGRIC	.012 (.009)	.006 (.172)	.029 (<.001)	.031 (<.001)	.007 (.095)	.006 (.147)	.032 (<.001)	.030 (<.001)
UNEMP	-.015 (.001)	-.015 (<.001)	-.015 (<.001)	-.016 (<.001)	-.016 (<.001)	-.015 (.001)	-.014 (<.001)	-.016 (<.001)
DIV_LAW	-.071 (.003)	-.092 (.002)	-.092 (<.001)	-.118 (<.001)	-.044 (.048)	-.080 (.005)	-.084 (.002)	-.127 (<.001)
CONSTANT	----	2300.96 (.003)	----	----	2273.85 (.011)	2248.67 (.013)	----	----
POS. COUNTRY FEs	DK, FR, NL, NO, ES, SE, UK	FR, NO, ES, UK	BE, DK, FI, FR, DE, IE, LU, NL, NO, ES, SE, CH, UK	BE, DK, FI, FR, DE, IE, LU, NL, NO, ES, SE, CH, UK	FR, IE, NL, NO, PT, ES, UK	FR, IE, NO, ES, UK	BE, DK, FI, FR, DE, IE, LU, NL, NO, ES, SE, CH, UK	BE, DK, FI, FR, DE, IE, LU, NL, NO, ES, SE, CH, UK
NEG. COUNTRY FEs				GR	LU	LU	GR	GR
N	533	533	427	427	533	533	427	427
R^2	.9453	.9442	.9737	.9737	.9137	.9134	.9193	.9201
$ALLOW_j$ DEF. (j = 1, 2)	1	1	2	2	1	1	2	2
DIV_LAW DEF. (U or N)	U	N	U	N	U	N	U	N
AUTOCORR. STRUCTURE (P or C)	P	P	P	P	C	C	C	C

Note: $ALLOW_1$ is the Gauthier (2010) measure of spending on family allowances as a fraction of GDP for the period 1960-1996 while

$ALLOW_2$ is the analog (calculated differently) for 1980-2008. For DIV_LAW, "U" denotes unilateral divorce while "N" denotes no-fault.

For AUTOCORR. STRUCTURE, "P" indicates panel-specific autocorrelation assumed, while "C" indicates common autocorrelation (across

panels) assumed.

Table 4: Prais-Winsten regression coefficients, with Southern Europe (SE) interaction terms (panel-corrected p-values in parentheses)

	(1_S)	(2_S)	(3_S)	(4_S)	(5_S)	(6_S)	(7_S)	(8_S)
YEAR	-4.27 (<.001)	-4.57 (<.001)	.211 (.793)	-.249 (.765)	-3.91 (<.001)	-3.66 (<.001)	-326 (.693)	-.498 (.564)
$YEAR^2$	.001 (<.001)	.001 (<.001)	-.00005 (.807)	.00007 (.750)	.001 (<.001)	.0009 (<.001)	.00009 (.679)	.0001 (.553)
INF_MORT_{t-1}	.007 (.022)	.007 (.016)	.015 (.013)	.015 (.020)	.006 (.070)	.007 (.029)	.017 (.018)	.015 (.028)
WAGE_RATIO	-.687 (.040)	-.842 (.013)	.041 (.818)	.013 (.941)	-1.14 (.003)	-1.19 (.002)	-.091 (.575)	-.085 (.584)
LFP_F	.0006 (.847)	.0006 (.838)	-.003 (.069)	-.004 (.051)	-.001 (.638)	-.001 (.603)	-.004 (.042)	-.003 (.064)
$ALLOW_j$	.049 (<.001)	.049 (<.001)	.104 (<.001)	.103 (<.001)	.042 (.001)	.041 (.001)	.093 (<.001)	.089 (<.001)
AGRIC	.004 (.468)	.004 (.491)	.056 (<.001)	.059 (<.001)	.0097 (.054)	.011 (.019)	.058 (<.001)	.051 (<.001)
UNEMP	-.012 (.001)	-.013 (.015)	-.017 (<.001)	-.017 (<.001)	-.013 (.014)	-.013 (.019)	-.015 (<.001)	-.015 (<.001)
DIV_LAW	-.056 (.024)	-.138 (.001)	-.086 (.007)	-.066 (.535)	-.044 (.085)	-.141 (.001)	.025 (.490)	-.080 (.460)
CONSTANT	----	----	----	----	----	----	----	----
YEAR*SE	4.32 (<.0001)	4.61 (<.0001)	-.216 (.788)	.246 (.767)	3.95 (<.0001)	3.70 (<.0001)	.327 (.692)	.501 (.562)
$YEAR^2$*SE	-.001 (<.0001)	-.001 (<.0001)	.0001 (.796)	-.00006 (.756)	-.001 (<.0001)	-.0009 (<.0001)	-.00009 (.677)	-.0001 (.550)
INF_MORT*SE	-.003 (.437)	-.003 (.368)	.015 (.099)	.012 (.176)	-.002 (.680)	-.003 (.482)	.013 (.195)	.015 (.114)
WAGE_RATIO*SE	.857 (.073)	1.06 (.023)	.214 (.492)	.236 (.451)	1.40 (.005)	1.45 (.004)	.338 (.253)	.267 (.351)
LFP_F*SE	-.008 (.107)	-.008 (.090)	-.004 (.309)	-.005 (.212)	-.004 (.419)	-.004 (.384)	.0003 (.936)	-.0005 (.908)
$ALLOW_j$*SE	.059 (.107)	.033 (.381)	-.032 (.657)	-.037 (.606)	.019 (.597)	.019 (.606)	-.033 (.652)	-.037 (.618)
AGRIC*SE	-.016 (.045)	-.014 (.058)	-.041 (.002)	-.044 (.002)	-.018 (.009)	-.020 (.004)	-.046 (<.001)	-.041 (.002)
UNEMP*SE	-.011 (.131)	-.013 (.081)	-.003 (.589)	-.003 (.490)	-.0096 (.215)	-.010 (.179)	-.003 (.498)	-.003 (.516)
DIV_LAW*SE	.001 (.986)	.099 (.058)	-.024 (.633)	-.077 (.506)	.031 (.522)	.117 (.027)	-.067 (.199)	-.028 (.810)
POS. COUNTRY FEs	AT, BE, DK, FI, FR, DE, GR, LU, NL, NO, PT, ES, SE, CH, UK	AT, BE, DK, FI, FR, DE, GR, IE,LU, NL, NO, PT, ES, SE, CH, UK	PT, ES, SE, CH, UK	ES	AT, BE, DK, FI, FR, DE, GR, LU, NL, NO, PT, ES, SE, CH, UK	AT, BE, DK, FI, FR, DE, GR, LU, NL, NO, PT, ES, SE, CH, UK	ES	ES

NEG. COUNTRY FEs								
N	533	533	427	427	533	533	427	427
R^2	.9699	.9585	.9690	.9608	.9279	.9134	.9246	.9243
$ALLOW_j$ DEF. (j = 1, 2)	1	1	2	2	1	1	2	2
DIV_LAW DEF. (U or N)	U	N	U	N	U	N	U	N
AUTOCORR. STRUCTURE (P or C)	P	P	P	P	C	C	C	C

Note: $ALLOW_1$ is the Gauthier (2010) measure of spending on family allowances as a fraction of GDP for the period 1960-1996 while $ALLOW_2$ is
the analog (calculated differently) for 1980-2008. For DIV_LAW, “U” denotes unilateral divorce while “N” denotes no-fault. For AUTOCORR.
STRUCTURE, “P” indicates panel-specific autocorrelation assumed, while “C” indicates common autocorrelation (across panels) assumed.

Table 5: Prais-Winsten regression coefficients, with Italy (IT) interaction terms (panel-corrected p-values in parentheses)

	(1_I)	(2_I)	(3_I)	(4_I)	(5_I)	(6_I)	(7_I)	(8_I)
YEAR	-2.70 (.001)	-2.86 (<.001)	-1.09 (.164)	-1.48 (.057)	-2.54 (.003)	-2.63 (.002)	-1.44 (.061)	-1.41 (.065)
$YEAR^2$	.0007 (.001)	.0007 (<.001)	.0003 (.160)	.0004 (.055)	.0006 (.004)	.0007 (.002)	.0004 (.059)	.0004 (.062)
INF_MORT_{t-1}	.007 (.001)	.007 (<.001)	.020 (<.001)	.019 (<.001)	.005 (.015)	.005 (.015)	.021 (<.001)	.021 (<.001)
WAGE_RATIO	-.400 (.129)	-.471 (.087)	.087 (.563)	.052 (.733)	-.578 (.035)	-.649 (.021)	-.013 (.931)	-.048 (.746)
LFP_F	.0003 (.910)	.0005 (.832)	-.003 (.099)	-.004 (.017)	-.0007 (.777)	-.0006 (.785)	-.004 (.027)	-.004 (.020)
$ALLOW_j$	.059 (<.001)	.060 (<.001)	.095 (<.001)	.099 (<.001)	.050 (<.001)	.050 (<.001)	.084 (<.001)	.088 (<.001)
AGRIC	.010 (.028)	.009 (.051)	.027 (<.001)	.030 (<.001)	.009 (.034)	.009 (.047)	.033 (<.001)	.032 (<.001)
UNEMP	-.015 (.001)	-.014 (.002)	-.013 (<.001)	-.014 (<.001)	-.016 (.001)	-.015 (.001)	-.012 (<.001)	-.014 (<.001)
DIV_LAW	-.065 (.004)	-.106 (.001)	-.095 (<.001)	-.116 (.051)	-.048 (.035)	-.097 (.003)	-.093 (.001)	-.147 (.024)
CONSTANT	----	----	----	----	----	----	----	----
YEAR*IT	2.73 (<.0001)	2.89 (<.001)	1.07 (.170)	1.47 (.060)	.035 (.068)	2.67 (.002)	1.43 (.063)	1.40 (.067)
$YEAR^2$*IT	-.0007 (<.0001)	-.0007 (<.0001)	-.0003 (.172)	-.0004 (.061)	-.00002 (.073)	-.0007 (.002)	-.0004 (.063)	-.0004 (.067)
INF_MORT*IT	.009 (.372)	.003 (.816)	.041 (.003)	.041 (.002)	-.007 (.478)	-.003 (.750)	.049 (.004)	.048 (.004)
WAGE_RATIO*IT	-1.31 (.242)	-.941 (.397)	.341 (.509)	.378 (.463)	.111 (.915)	.176 (.856)	.518 (.396)	.552 (.364)
LFP_F*IT	-.032 (.002)	-.029 (.006)	.018 (<.001)	.019 (<.001)	-.025 (.018)	-.020 (.039)	.020 (<.001)	.021 (<.001)
$ALLOW_j$*IT	-.042 (.486)	-.040 (.497)	-.006 (.896)	-.008 (.859)	-.056 (.295)	-.053 (.296)	-.131 (.023)	-.135 (.019)
AGRIC*IT	-.026 (.241)	-.025 (.255)	-.012 (.388)	-.015 (.286)	-.042 (.041)	-.029 (.143)	-.028 (.120)	-.027 (.144)
UNEMP*IT	.0005 (.981)	-.003 (.874)	.003 (.592)	.004 (.433)	.00006 (.998)	-.002 (.899)	-.005 (.583)	-.003 (.704)
DIV_LAW*IT	----	.029 (.715)	----	----	----	.018 (.793)	----	----
POS. COUNTRY FEs	AT, BE, DK, FI, FR, DE, GR, LU, NL, NO, PT, ES, SE, CH, UK	AT, BE, DK, FI, FR, DE, LU, NL, NO, PT, ES, SE, CH, UK			IE, NO, ES	AT, BE, DK, FI, FR, DE, LU, NL, NO, PT, ES, SE, CH, UK		

NEG. COUNTRY FEs								
N	533	533	427	427	533	533	427	427
R^2	.9628	.9631	.9868	.9863	.9193	.9217	.9208	.9222
$ALLOW_j$ DEF. (j = 1, 2)	1	1	2	2	1	1	2	2
DIV_LAW DEF. (U or N)	U	N	U	N	U	N	U	N
AUTOCORR. STRUCTURE (P or C)	P	P	P	P	C	C	C	C

Note: $ALLOW_1$ is the Gauthier (2010) measure of spending on family allowances as a fraction of GDP for the period 1960-1996 while $ALLOW_2$ is
the analog (calculated differently) for 1980-2008. For DIV_LAW, "U" denotes unilateral divorce while "N" denotes no-fault. For AUTOCORR.
STRUCTURE, "P" indicates panel-specific autocorrelation assumed, while "C" indicates common autocorrelation (across panels) assumed.

4. Concluding remarks

Much scope for refining and expanding this work remains. Adding covariates to directly capture living standards, as well as indices of the availability of abortion and contraception, would strengthen confidence in the results presented. Alternative definitions of family allowance generosity would also test the sensitivity of these results. Finally, extensions of this work to pre-1960 and to regional variation within Italy would add information on the longer timepath of fertility, and on important within-country variation.

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