The socio-economic determinants of childbearing intentions:

A macro-micro analysis

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In this paper I investigate the individual and country level socio-economic determinants of child-number and child-timing intentions in Europe. The analysis is based on the Eurobarometer surveys conducted in 2006 and 2011 which contained several questions on childbearing intentions.

Two different sets of multi-level proportional-odds models are used with a response variable equals to the number of additionally intended children or to the timing of the next intended child. The results show that at the individual level child-number intentions are correlated with enduring characteristics of individuals, like religiosity and level of education while child-timing intentions are closely associated with more transient characteristics, like enrolment in education or non-marital status. The perceived behavioural control is an important factor affecting both the number of additionally intended children and the timing of the next intended chid: the more control is perceived the larger the intended family size and the sooner the child is planned.

At the country level the proportion of high educated people positively influences the child-number and the child-timing intentions. This result holds independently on whether individuals are childless or have already one child. The Gross Domestic Product (GDP) per capita affects negatively the timing of the next intended child and positively the timing of the second intended child. This results is in line with the positive relationship between Human Development Index and Total fertility Rate observed in the OECD countries (Myrskylä et al.2009).

Keywords: *fertility decision-making, multilevel analysis, child-timing intentions, child-number intentions, proportional odds models*

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1. Introduction

Fertility intentions are among the strongest predictors of subsequent fertility and operate as key proximate variables in predicting fertility behaviour (Schoen et al. 1999; Ajzen 1991). Hence, they take a central role in understanding contemporary fertility trends.

One of the most common theoretical frameworks used by demographers to explain fertility decision-making is the theory of Planned Behaviour developed in the field of social psychology (Ajzen 1988 and 1991). According to it, intentions are seen as directly dependent on three components: (a) personal positive and negative attitudes towards the behaviour, i.e. having a child, (b) subjective norms, i.e., perceived social pressure towards engaging or not engaging in the behaviour; and (c) perceived behavioural control, i.e., ability to perform the behaviour which may depend, for example, on the availability of housing, income, or other different resources.

The theory has been adapted to the analysis of fertility decisions by several demographers (Schoen et al. 1999; Liefbroer 2005; Barber, 2001; Philipov et al. 2006; Billari et al. 2009). However, the role of macro-level contextual factors in the decision-making process has not been explicitly considered. Building a link between macro-level background factors and micro-level variables that influence fertility remains a major challenge in demographic research.

The current contribution examines the determinants of both child-quantum and child-timing intentions in a micro-macro framework with the aim to add new insights in the influence of macro level factors on the individual decision-making process. The emphasis is put on the influence of socio-economic contextual factors.

The rest of the paper proceeds as follows: the next session outlines the theoretical backgrounds, next the data and the methods used in the analysis are described, eventually the results are presented and some of their implications and caveats are discussed in the final section.

2 Theoretical considerations

A variety of theories have been developed to explain low fertility. A nice review of them can be found in van de Kaa (1996) or in Morgan and Taylor (2006). In each of these theories a different approach has been proposed which gives particular emphasis to a different set of determinants. The socio-economic explanation of low fertility focuses on the direct and indirect opportunity costs of having children (**Becker 1981**). According to this approach the women's increased economic independence achieved through improved education and higher labour force participation reduces the gains from marriage based on the interdependence of the traditional gender division of labour in the family and increases the relative costs of childbearing. This is because of their foregone earnings while they take care for the children at home or reduce their work hours. A second group of theories gives emphasis to the gender systems and the gender inequality as a source of fertility differentials across countries which may explain the lowest-low fertility in Southern Mediterranean countries. McDonald (2000) suggests that very low fertility may be the result of a hiatus that has developed in some developed countries between high levels of gender equity in individual-oriented institutions and sustained gender inequity in family-oriented social institutions. If in recent years women have been given the

same opportunities as men in education and to some extent in the labour market, this has not occurred within the family. The higher level of achieved education made the women more empowered in their decision-making both in relation to household labour and fertility because their high level of education allows them to question traditional roles (**Mc Donald 2006**). Another approach sees fertility postponement, which may ultimately results in foregone fertility as a rational response to the economic insecurity and increasing opportunity costs of childbearing for women (**Kohler et al. 2002; Mills et al. 2005**). Additional theories focus on shifts in ideology and investment in children often referred to in relation to the second demographic transition (**Lesthaeghe and van de Kaa 1986; van de Kaa 1987**).

Research hypotheses (at the individual level):

1) Education negatively affects the timing of the first intended child
2) Perceived behavioural control (as measured by the) positively influences childbearing intentions

Research hypotheses (at the macro level):

1) The GDP per capita positively influences childbearing intentions, the number of additionally intended children or the timing of the next intended child
2) The Gender Empowerment measure, as an indicator of gender equality in the country, positively influences childbearing intentions.
3) The earlier start of postponement transition is positively associated with childbearing intentions.

3 Data

The empirical analysis is based on the Eurobarometer surveys carried out in 2006 and 2011 which contains 15 questions aimed at studying fertility-related behaviour for the 27 EU countries. The stratified sampling procedure assures nearly equal probability samples of about 1,000 respondents in each of the country. The sample size allows equally precise estimates for small and large countries as well as comparisons between sub-groups broken down by sex, age, education, marital status and so on. The survey used a single uniform questionnaire design, with particular attention being paid to equivalent question wording across languages. A broad descriptive analysis of the data may be found in a previous paper (Testa 2006). The results shown in this extended abstract refer only to the Eurobarometer 2006. The new EB survey carried out in 2011, whose data have been just released, will be also analysed in the next draft of the paper.

3.1 Dependent variables

The response variable used in the first round of the multivariate analysis is the intended number of children which is surveyed through the following item: "*How many children do you (still) intend to have*?" As response options a range from 0 to up to 6 children was listed in the questionnaire. The prospective item comes after the question about the number of children already had and is clearly devoted to pick up the births which respondents plan to have in their future reproductive career. No

distinction is made between biological and adopted children in both these questions. The variable is codified in the analysis as an ordinal variable with four categories: 0, 1, 2, 3 or more children. Values greater than or equal to 3, in the light of their low frequency, are collapsed into a single category.

The response variable used in the second round of the multivariate analysis is the intention to have a child within a short-term period which is surveyed through the following item: "*Do you intend to have a(nother) child in the next three years?*" The question on child-timing intentions comes after the item on child-number intentions in the survey questionnaire and only those respondents who intend to have one or more children were asked about the timing for their next intended child. Response options to the child-timing question were: *definitely yes, probably yes, probably not, definitely not*. The variable is treated as an ordinal variable with four categories and 0 standing for definitely not.

3.2 Models

Random intercept ordinal proportional logistic models are used to estimate the predictors of child-timing and child-number intentions. The clustering of individuals in regions and in countries is considered as a phenomenon of interest rather than a mere disturbance (Snijders and Bosker 1999). Hence multilevel models are used in the attempt to represent the complex causal process underlying the behaviour of individuals living in a social context and allowing valid inferences on the relationships at the relevant hierarchical levels.

3.3 Independent variables

Individual-level covariates. Individual explanatory variables included in the models are: age, sex, school enrolment, level of education, marital status, employment status, household situation, attendance of religious services, gender attitudes in childrearing. All covariates are referred to the time of the interview. Unfortunately, the data do not carry any retrospective information concerning the previous history of respondents, which could allow us to estimate the role of biographical trajectories on the process of forming family size intentions in a dynamic framework.

Almost the same set of covariates is used in the models for the timing and quantum of intended fertility with the only exception of child-number intentions which are included as a dependent variable in the models for the intention to have a child within the next three years with the assumption that the total intended family size will be closely correlated with the timing of the next intended child.

Country-level covariates. The country-level explanatory variables included in the models are: the proportion of high educated people, the Gross Domestic Product (GDP) in Purchasing Power Standards (PPS), the gender empowerment measure as an indicator of the level of gender equity in the country, the year of the onset of fertility postponement. The country GDP per capita is referred to the year 2006 and provided by the Eurostat online statistics. The volume index of GDP per capita in Purchasing Power Standards (PPS) is expressed in relation to the European Union (EU-27) average set to equal 100. If the index of a country is higher than 100, this country's level of GDP per head is higher than the EU average and vice versa. Basic figures are expressed in PPS, i.e. a common currency that eliminates the differences in price levels between countries allowing meaningful volume

comparisons of GDP between countries. This covariate should reflect the cross-country differences in socio-economic conditions at the time when the fertility intentions are reported by the respondents.

4. Expected results

In this analysis I use proportional odds random intercept models to investigate the factors that affect childbearing intentions in Europe. Both the quantum and the timing of intended fertility are considered. Individuals are assumed to be part of a complex system whose relations are defined in a contextual framework, and therefore personal individual preferences are explained by both micro-level variables and macro-level factors.

At the individual level, child-number intentions and child-timing intentions are characterised by different influential factors but have also some common determinants.

The plan to have a child within the next three years is more closely related to situational factors, as for example living in a cohabiting partnership or still being enrolled in school. Whereas the plan to have a specified family size is closely linked to more enduring background characteristics of people such as religiousness. There are, however, some common predictors of child-number and child-timing intentions, like the ability to foresee what one's household situation will be like in the next one or two years (used here as a proxy measure of the perceived behavioural control) which tends to increase the intended family size as well as the certainty of a short-term childbearing intention.

Once the individual-level demographic and socio-economic factors are controlled for, there is a significant regional-level or country-level variance left that could be usefully explained by contextual cultural and economic factors.

I include the country current GDP per capita to study the possibility of a positive influence of this indicator on childbearing intentions following the literature that sees GDP per capita to be responsible for the recent fertility rebound registered at a macro level (Luci and Thévenon 2010).

The analysis has some caveats. First, cross-sectional data do not allow the investigation of the process of forming intended family size in a dynamic way in which the inter-relationship between the actual and the intended family size is examined by explicitly considering its bi-directional nature. I hope that good quality longitudinal data will become available in the future for as many countries as considered in the current study. Second, the contextual effects may be the results of selective migration (Nauck 1995). Eventually, the limited national sample sizes prevent any detailed analysis at national level.

Another important finding of the current study is that the country's GDP per capita delays the first child but anticipates the second child intention. Evidently, the positive influence of the economic development on ultimately family size is exerted through the anticipation of a second birth.

The findings may help to give a new reading to the theories of fertility decision-making process while bringing a bridge between macro-level background factors and micro-level variables that influence fertility decisions.

These results are rich in implications for policy makers. The worsening of the economic performance of many countries may (temporarily) have negative repercussions on the fertility levels by stimulating a substantial postponement of the decision to have a second child.

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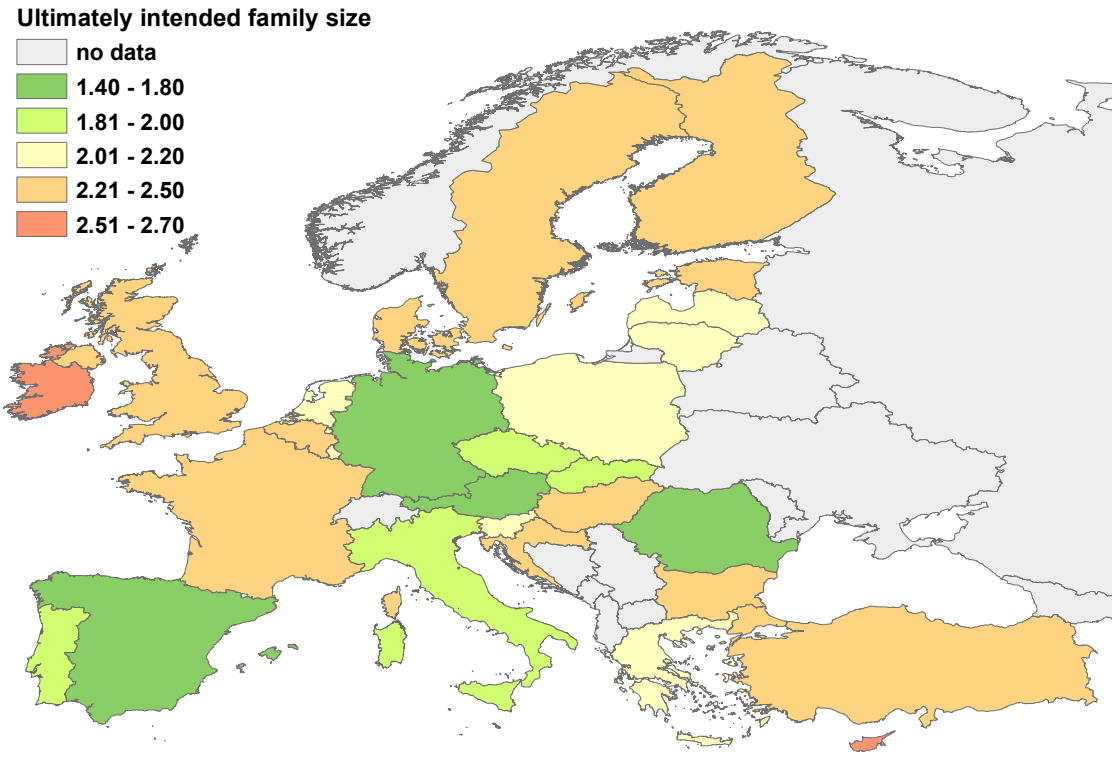
Table 1 Description of the individual-level, the regional-level and the country-level covariates in the sample (5291 individuals) . Year 2006.

INDIVIDUAL-LEVEL COVARIATES	DESCRIPTION	MEAN	STD. DEV.	MIN	MAX
AGE (in years)		28	5.5	20	39
GENDER	1=male; 0=female	0.46	0.50	0	1
MARITAL STATUS					
Married	1=married; 0 otherwise	0.33	0.47	0	1
Cohabiting	1=cohabiting; 0 otherwise	0.21	0.41	0	1
Separated or divorced	1=dep. or div.; 0 otherwise	0.04	0.19	0	1
Single	1=single; 0 otherwise	0.42	0.49	0	1
EDUCATION					
Low level	1= low; 0 otherwise	0.07	0.25	0	1
Medium level	1=medium; 0 otherwise	0.44	0.50	0	1
High level	1=high; 0 otherwise	0.33	0.47	0	1
Enrolled	1=enrolled; 0 otherwise	0.16	0.36	0	1
EMPLOYMENT					
Employed	1= employed; 0 otherwise				
Not employed	1=unemployed or inactive; 0 otherwise	0.18	0.8	0	1
HOUSEHOLD SITUATION					
Having a long-term perspective of the situation	1=able to make a plan for the next 1 or 2 years; 0 otherwise	0.35	0.48	0	1
RELIGIOUSNESS					
Regular attendance of religious services	1= Attending religious services at least once a month; 0 otherwise	0.18	0.38	0	1
GENDER ATTITUDES					
Equal gender roles	1= equity in gender roles; 0 otherwise	0.16	0.37	0	1
AGE AT FIRST CHILD	1=before age 26; 0 otherwise	0.54	0.50	0	1
CHILD-NUMBER INTENTIONS	1=two or more children; 0 otherwise	0.17	0.38	0	1
COUNTRY-LEVEL COVARIATES					
Log GDP PER CAPITA IN PPS IN 2006		4.41	0.41	3.60	5.61

Figure 1 Ultimately intended family size. Women and men aged 20-39 in 29 European countries.



Note: the ultimately intended family size corresponds to the sum of actual number of children plus the intended number of children.

Table 2 Mean ultimately intended family size, completed cohort fertility of women born in 1968 and Total Fertility Rates in the year 2006 by country.

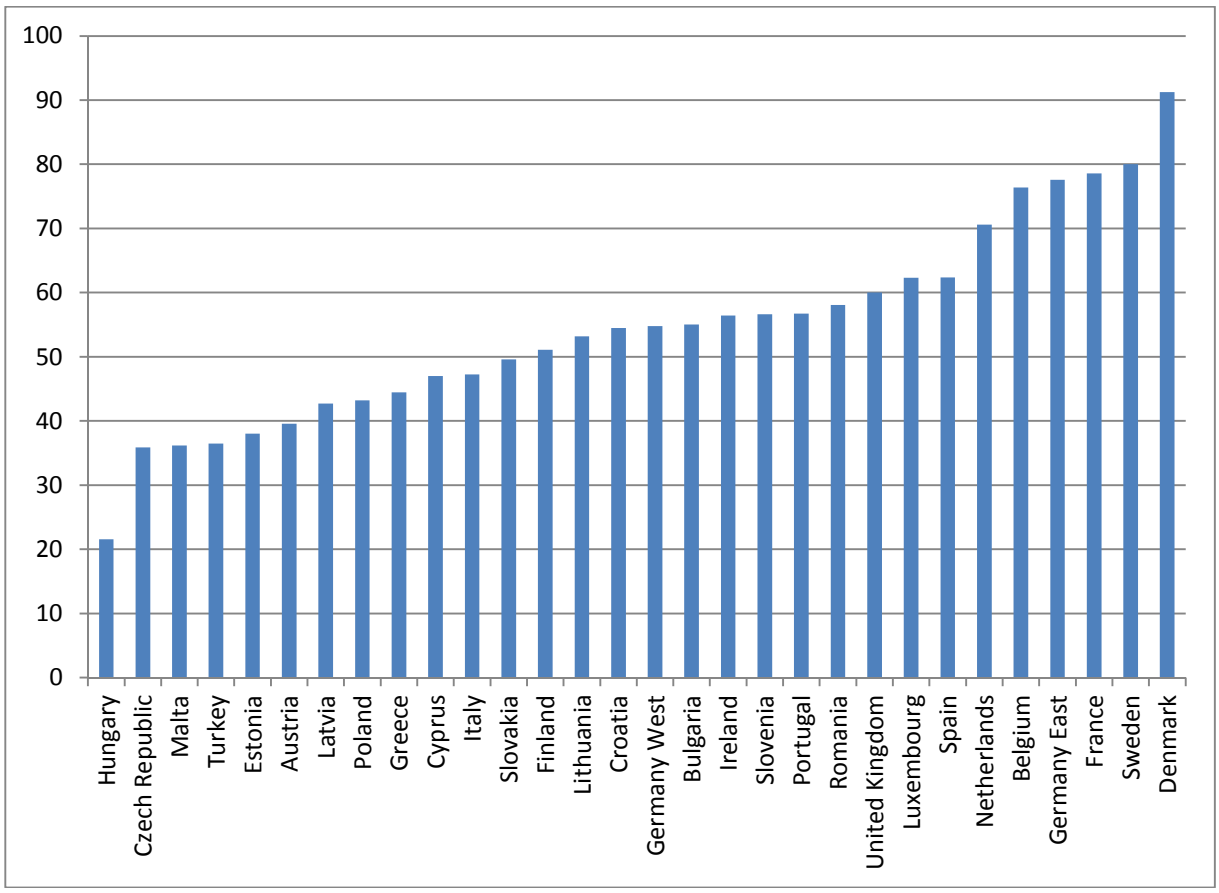
Countries	Ultimately intended family size	Completed fertility, women born in 1968	Total Fertility Rate Year 2006
Austria	1.44	1.62	1.41
Belgium	2.04	1.85	1.76
Bulgaria	2.12	1.83	1.38
Croatia	2.11	1.80	1.38
Cyprus	2.43	2.22	1.45
Czech Rep.	1.94	1.90	1.33
Denmark	2.21	1.97	1.85
Estonia	2.12	1.88	1.55
Finland	2.26	1.90	1.84
France	2.22	2.02	2.00
Germany	1.77	1.49	1.33
Greece	2.06	1.73	1.4
Hungary	2.14	1.92	1.34
Ireland	2.33	2.10	1.93
Italy	1.83	1.52	1.35
Latvia	2.03	1.80	1.35
Lithuania	2.00	1.81	1.31
Luxembourg	2.08	1.81	1.65
Malta	1.96	1.79	1.39
Netherlands	2.18	1.78	1.72
Poland	2.06	1.90	1.27
Portugal	1.96	1.75	1.36
Romania	1.7	1.72	1.32
Slovakia	1.87	2.00	1.24
Slovenia	2.09	1.8	1.31
Spain	1.76	1.53	1.38
Sweden	2.31	1.99	1.85
Turkey	2.09	2.92	2.21
United Kingdom	2.15	1.90	1.84

Sources: Ultimately intended expected family size is computed only on the female population aged 20-39 years taken from the 2006 EB; Completed cohort fertility is taken from the European Demographic Datasheet 2010; the Total Fertility Rate is taken from Council of Europe 2005.

Table 3 Perceived relevance of various factors in the decision on whether to have or not have a\another child. Percentage distribution of individuals aged 20-39 years by country

Countries	Factors relevant in childbearing decision-making (%)			
	Economic	Health	Partner	Institutions
Austria	89	82	66	70
Belgium	72	75	71	49
Bulgaria	96	91	84	80
Croatia	90	89	78	74
Cyprus	88	96	84	72
Czech Rep.	93	91	85	82
Denmark	54	74	81	57
Estonia	90	88	79	79
Finland	55	77	74	57
France	76	73	65	56
Germany	84	81	75	60
Greece	97	96	88	66
Hungary	93	90	82	68
Ireland	81	81	66	54
Italy	86	81	71	65
Latvia	94	91	76	86
Lithuania	92	86	83	80
Luxembourg	81	82	76	67
Malta	93	96	70	68
Netherlands	67	80	68	49
North Ireland	75	70	58	60
Poland	87	83	76	64
Portugal	86	83	72	72
Romania	94	92	81	78
Slovakia	94	92	82	60
Slovenia	87	90	79	68
Spain	83	79	69	67
Sweden	63	83	78	74
Turkey	93	89	79	87
United Kingdom	84	81	77	64

Figure 2 Equal gender roles in child rearing tasks. Percentage distribution of individuals aged 20-39 years who disagree about a polarized gender distribution of tasks by country.

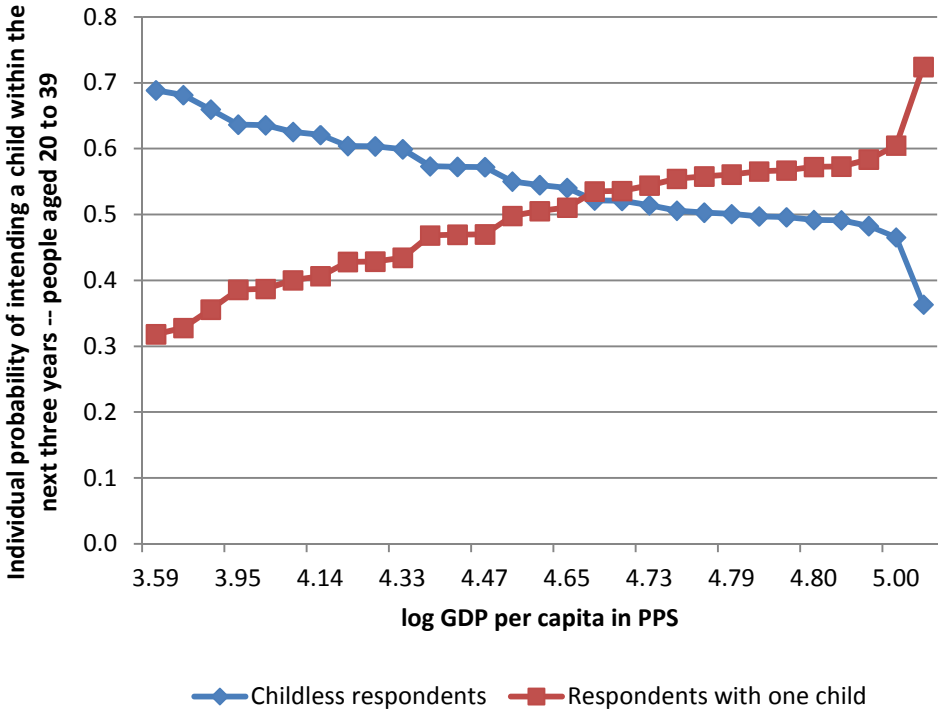


Survey item: "*Ideally, the woman should stay at home to look after the children while the man goes out to work*". Percentages of individuals who disagree.

Table 4 Mean intended number of children and share of individuals who intend to have a child in the next three years. Analytical samples of respondents childless and with just one child.

Countries	Childless		With one child	
	Quantum	Timing	Quantum	Timing
Austria	0.94	52	1.12	88
Belgium	1.79	51	1.63	91
Bulgaria	1.88	72	1.52	71
Croatia	2.09	55	1.25	83
Cyprus	2.26	50	1.46	85
Czech Rep.	1.62	54	1.13	87
Denmark	2.05	52	1.69	97
Estonia	1.83	69	1.27	82
France	1.98	68	1.53	94
Fuinland	1.97	54	1.37	95
Germany	1.46	40	1.24	84
Greece	2.03	41	1.21	92
Hungary	1.73	51	1.30	84
Ireland	1.84	38	1.69	91
Italy	1.66	56	1.39	85
Latvia	1.67	72	1.54	76
Lithuania	1.96	76	1.14	80
Luxembourg	1.52	61	1.13	88
Malta	1.57	41	1.50	50
Netherlands	1.58	54	1.44	84
Poland	1.94	61	1.15	73
Portugal	1.66	56	1.24	97
Romania	1.40	79	1.35	81
Slovakia	1.59	48	1.19	81
Slovenia	1.97	47	1.29	94
Spain	1.63	44	1.10	94
Sweden	2.06	53	1.24	100
Turkey	1.38	52	1.46	89
United Kingdom	1.70	54	1.61	86

Figure 4 Effect of GDP on the individual probability of intending a child within the next three years. EU-27 plus Turkey and Croatia. Year 2006.



Note. Probabilities computed for the base individual (all the individual covariates are set to the base category, while the regional-level covariates are set to the value of southern region of Czech Republic and the random effect is set to zero). Probabilities refer to the 'Definitely yes' response.