

Convergence and Growth: Demographic factors and convergence clubs

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Abstract

This paper evaluates the role of demographics in post-war growth and convergence. Different timing of the demographic transition has segmented countries into different regimes and their simultaneous existence makes the concept of convergence meaningless if neglected. This paper classifies countries into demographic clubs by the Hansen method and applies unit root convergence tests to the clubs. The unit root tests range from the traditional tests to the second generation tests and tests with breaks in trend.

JEL classification: O47, J11, C23

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1 Introduction

This paper evaluates the role of demographics in post-war growth and convergence. Different timing of the demographic transition has segmented countries into different regimes and their simultaneous existence makes the concept of convergence meaningless if neglected. This paper seeks non-linearities in the standard growth model by applying Hansen's threshold estimation method (Hansen 2000). To permit comparability with earlier findings, both standard and demographic threshold candidates are tested. The paper also applies unit root convergence tests to the discovered clubs, these tests ranging from traditional to the so called second generation tests and tests with breaks.

Our first important finding is that the variables suggested in earlier literature (Durlauf and Johnson 1995, Hansen 2000) do not survive the threshold test in our data. In contrast, two demographic variables – total fertility rate and life-expectancy – exhibit significant threshold power, both variables classifying the data into three demographic regimes or clubs.

The paper is structured as follows. Section 2 reviews the methods and the data, Section 3 generates the clubs and Section 4 provides the convergence tests. Section 5 discusses the merits of the findings.

2 Data and Methods

2.1 The Hansen Method and Threshold Variables

To investigate the role of demographics in the convergence of countries, we collect data for incomes, education and demographic variables for the period 1970 - 2000. To permit comparison with Durlauf and Johnson (1995) and Hansen (2000), we apply the standard growth model

$$\begin{aligned} growth_i &= \gamma + \beta \ln(Y/L)_{i,t_0} + \phi_1 \ln(I/Y)_{i,t_0} \\ &+ \phi_2 \ln(school)_{i,t_0} + \phi_3 \ln(n_{i,t_0} + g + \delta) + \epsilon_i \end{aligned} \tag{1}$$

Y/L = real per capita GDP (international dollars, 2005).

$growth$ = average annual growth rate of Y/L .

I/Y = investment share of real per capita GDP.

$school$ = adult literacy rate.

$n + g + \delta$ = population growth, rate of technical progress and depreciations.

where the effective depreciation $n + g + \delta$ calculates country-specific population growth rates n_{i,t_0} but assumes identical value of $g + \delta = 0.05$ for all countries. The time indexes t_0 and T refer to years 1970 and 2007 respectively. Measuring the right hand side variables at the beginning of the research period presumable keeps them exogenous to $growth$.¹

Since we assume that the model may be different for different regimes or clubs, we apply threshold estimation to (1). Following Hansen (2000), equation (1) is extended to allow for non-linearities by transforming it to a two-regime threshold model,

$$growth_i = \begin{cases} \theta_1 z_i + e_i, & \text{if } q_i \leq \gamma \\ \theta_2 z_i + e_i, & \text{if } q_i > \gamma \end{cases}, \quad (2)$$

where z_i is $(1, \ln(Y/L)_{i,t_0}, \ln(I/Y)_{i,t_0}, \ln(n_i, t_0 + g + \delta), \ln(school)_{i,t_0}, \epsilon_i)$ and q_i is the threshold variable, which may or may not be a element of z_i , and e_i is the regression error. The threshold parameter γ belongs to a bounded set Γ which is a strict subset of the support of q_i . Equations (1) - (2) can be written as a single equation

$$growth_i = \theta' z_i + \delta'_n z_i(\gamma) + e_i, \quad (3)$$

where $z(\gamma) = z_i d_i(\gamma)$ includes a dummy variable $d_i(\gamma) = z_i \{q_i \leq \gamma\}$. Equation (3) allows the regression parameters to switch between regimes depending upon the value of q_i and the unknown threshold value γ .

The threshold equation (3) can be estimated with OLS using concentrated sum of squared errors (SSE) (Hansen 2000). The objective is to find the

¹Hansen (2004) has recently proposed an instrumental technique for threshold estimation with endogenous right hand side variables.

values of γ that minimize the sum of squared errors. The smallest value of SSE yields the estimate $\hat{\gamma}$.

For the shake of comparison, we first utilize the threshold variables successfully applied by Durlauf and Johnson 1995 and Hansen 2000, namely initial income and schooling (already elements in (1)). As a novelty, we propose four demographic threshold candidates, namely fertility, dependence rate, life expectancy and infant mortality, the role of which has been recently debated by Galor and Weil (2000), Acemoglu and Johnson (2007) and Galor (2007). The details of these variables are

tfr = total fertility rate (children per woman).

dep = dependency rate (ratio of population aged 0-14 and 65+ per 100 population 15-64).

lif = life expectancy (at birth, both sexes).

imr = infant mortality rate (infant deaths per 1,000 live births).

To keep these threshold variables exogenous, they are also measured at the beginning of the research period.

Data for the variables is available for 101 countries. Countries that have experienced extreme economic or social changes are excluded from this sample.² The demographic data come from World Bank (2009) and the economic data from Heston et al. (2009). For the full data set, see Appendix A.

2.2 The Unit Root Tests

We also investigate whether the generated clubs exhibit the convergence of incomes. Evans (1998) first applied the panel unit root tests for the stationarity of output differences. This property can be tested by using four nested

²The excluded countries are the highest AIDS prevalence countries (Lesotho, South-Africa and Zimbabwe), the oil countries (OPEC members), and the East-European countries. We also exclude Rwanda and China because of the mass murders in the former and the population policy in the latter.

specifications from general to specific:

$$\begin{aligned} \text{Model 1} : \quad \Delta(y_{i,t} - \bar{y}_t) &= \alpha_i + \rho_i(y_{i,t-1} - \bar{y}_{t-1}) + (\Delta D_{it} - \rho_i D_{i,t-1})\delta_i, \\ &+ (u_{i,t} - \bar{u}_t), \end{aligned}$$

$$\text{Model 2} : \quad \Delta(y_{i,t} - \bar{y}_t) = \alpha_i + \theta_i t + \rho_i(y_{i,t-1} - \bar{y}_{t-1}) + (u_{i,t} - \bar{u}_t),$$

$$\text{Model 3} : \quad \Delta(y_{i,t} - \bar{y}_t) = \alpha_i + \rho_i(y_{i,t-1} - \bar{y}_{t-1}) + (u_{i,t} - \bar{u}_t),$$

$$\text{Model 4} : \quad \Delta(y_{i,t} - \bar{y}_t) = \rho_i(y_{i,t-1} - \bar{y}_{t-1}) + (u_{i,t} - \bar{u}_t),$$

where $y_{i,t}$ is the logarithm of $Y_{i,t}$, $\bar{y} = \frac{1}{N} \sum_{i=1}^N y_{i,t}$, $u_{i,t}$ is $iid(0, \sigma^2)$, and

$$\Delta D_{it} = \begin{cases} 1 & t \leq T_{B,i} + 1 \\ 0 & \text{otherwise} \end{cases},$$

where $T_{B,i}$ is the time period of structural shift in the i th series. *Models 1, 2, and 3* include a country-specific constant α_i , necessary if some slowly-changing factor wedges the incomes from the mean. *Models 1 and 2* also include a country-specific trends, addressing time-related factors, such as the diffusion of technology, which may take place at different pace in different countries (Lee *et al.* 1997). It is often necessary to allow this kind of heterogeneity even within clubs since a complete control of heterogeneity by clustering may not be possible. Only the test with no intercept and trend (*Model 4*) refers to decreasing income gaps, i.e., to unconditional convergence, whereas *Models 1, 2, and 3* refer to the conditional one. For discussion see Pesaran (2007b) and Pedroni (2007).

In *Models 2-3*, country i converges to the mean (has a stationary time series of income differences) if the estimate for ρ_i is negative. Im, Pesaran and Shin (IPS, 2003) propose a test statistics which builds on Augmented Dickey Fuller (ADF) test. This test assumes individual unit root processes, indicating that countries may convergence at different rates and some countries may not converge at all.

The tests in *Models 2-3* have recently been critiqued on *two* grounds. The first of them claims that the first generation tests above do not properly deal with the cross-section dependence, potentially arising due to spatial and spill-over effects or other common factors unobserved in the data (Baltagi and Pesaran 2007). True enough, IPS allows a limited amount of cross-section dependence due to demeaning in the presence of common time effects, but demeaning does not help if reaction to shocks differs across countries. Pesaran (2007a) has indeed shown that, with low cross-section dependence, IPS performs reasonably well but, with high dependence, it tends to over-reject the no-convergence null. To correct the bias from cross-section dependence, Pesaran (2007a) proposes a modified IPS with a single unobserved common factor. This, however, does not come without costs: if no dependence exists, the corrected test performs worse than the original test.

To discover the cross-section dependence in the data, the CD-test proposed by Pesaran (2007a)³ calculates

$$CD = \sqrt{\frac{2T}{N(N-1)}} \left(\sum_{i=1}^{N-1} \sum_{j=i+1}^N \hat{\gamma}_{ij} \right), \quad (4)$$

where T and N are the number of observations in time and cross-sections, and $\hat{\gamma}_{ij}$ is the residual correlation between countries i and j , these residuals being obtained from individual ADF(p) regression. The statistics of this test is normally distributed with $N(0, 1)$, but the drawback is that it lacks power if the population average pair-wise correlation is (close to) zero. Another test, proposed by Breusch and Pagan (1980)

$$LM = T \sum_{i=1}^{N-1} \sum_{j=i+1}^N \hat{\gamma}_{ij}^2 \quad (5)$$

is based on $\chi_{N(N-1)/2}^2$ distribution. While this test is not affected by the zero

³Pesaran et al. (2007) proposed the use of a bias-adjusted LM test. They show that this test is more robust than the other two. The problem with the adjusted LM test is that it assumes strong exogeneity, which does not hold in our data.

averages, it is likely to exhibit substantial size distortions when N is large and T is small.

3 Results I: Hansen Results

This section reports the threshold estimation. Maybe the most prominent feature is that the initial values of income and schooling suggestfully applied by Durlaud and Johnson (1995) and Hansen (2000) are not statistically significant threshold variables in our data.⁴ From the demographic threshold candidates, the same holds for infant mortality and dependency rate (estimates not reported). In contrast, the role of fertility (tfr) and life-expectancy (lif) is significant. Table 3 reports the threshold estimates from (3) for the initial income, schooling, life expectancy and total fertility.⁵ The lower part of Table 3 shows that further exploration of the sub-samples generated by the first split reveals an additional sub-sample both for life expectancy-based and fertility-based clubs. Therefore, the ultimate number of clubs is three in both cases.

Figures 1 and 2 present the graphs of the normalized likelihood ratio sequence $LR(\gamma)$ for life expectancy and fertility in the first threshold estimation. The LS estimate of $\hat{\gamma}$ is the value that minimizes the graph. The 95% critical value is plotted as a dotted line. The asymptotic 95% confidence interval is visible in both graphs where the $LR(\gamma)$ crosses the dotted line.

The confidence intervals in the first and second splits turn out to be markedly tight for life expectancy. There are actually no countries that fall within these intervals indicating that the classification into clubs can be performed without facing a single unclear case. On the other hand, the confidence intervals for fertility are relatively large: 33 countries fall within these intervals, implying that the classification into clubs is not decisive.

⁴The research period in Durlaud and Johnson (1995) and Hansen (2000) was 1960 – 1985, the sample consisted of 121 countries.

⁵Estimation with Gauss, the code provided by Hansen (2000)

Table 1: Threshold estimation of selected variables

variable	threshold estimate	p-value	confidence interval
$\log(Y/L)_{i,1970}$	7.968	0.628	6.7602, 8.9681
$\log(school)_{i,1970}$	2.912	0.104	2.8385, 4.3795
$\log(LIF)_{i,1970}$	3.896	0.008	3.8958, 3.8958
$\log(TFR)_{i,1970}$	1.893	0.009	1.6986, 1.9181

Estimation using sub-samples of *LIF* and *TFR* thresholds

$\log(LIF)_{i,1970} \leq 3.896$	3.753	0.888	3.7536, 3.7526
$\log(LIF)_{i,1970} > 3.896$	4.011	0.009	4.0113, 4.0113
$\log(TFR)_{i,1970} \leq 1.893$	1.845	0.037	1.8145, 1.8453
$\log(TFR)_{i,1970} > 1.893$	1.932	0.668	1.8940, 2.0936

H_0 = no threshold effect. Asymptotic critical value is 7.35. P-values are generated using bootstrap analogue with 10000 replications, because the threshold value γ is not identified under the null hypothesis. P-values are calculated by fixing the regressors from the right-hand side of the estimated equation (2) and generating a bootstrap dependent variable from the distribution $N(0, \hat{e}_i^2)$, where \hat{e}_i^2 is OLS residual from the estimation of model (2) (Hansen 2000).

Table 2: Cross-section regression results of subsamples defined according to the thresholds of life expectancy

Dependent variable: <i>growth</i>					
	full	LIF	LIF	TFR	TFR
	sample	≤ 3.896	> 3.896	≤ 1.893	> 1.893
constant	-0.0744* (0.0201)	0.0802 (0.055)	-0.0437* (0.0247)	-0.0284 (0.0211)	0.286 (0.0893)
$\log(Y/L)_{i,1970}$	-0.0041* (0.0019)	-0.0179* (0.0056)	-0.0049* (0.0021)	-0.0087* (0.0022)	-0.0021 (0.0061)
$\log(I/Y)_{i,1970}$	0.0192 (0.0165)	0.0148 (0.0337)	0.0156 (0.0171)	0.0285 (0.0163)	-0.0220 (0.0405)
$\log(n_i + g + \delta)$	-0.0315* (0.0077)	-0.0145 (0.0196)	-0.037* (0.0097)	-0.0205 (0.0082)	0.0043 (0.0244)
$\log(school)_{i,1970}$	0.0092* (0.0033)	0.0034 (0.0047)	0.0008 (0.0045)	0.0148* (0.0049)	0.0006 (0.0043)
R^2	0.33	0.24	0.34	0.39	0.02
countries	101	29	72	75	26

* = significant at the 5% or higher level. Standard errors of the parameter estimates are presented in parentheses. Standard errors are heteroskedasticity-consistent. All estimations are done with OLS.

Table 2 reports the estimation results of equation (1) for the full sample and for the clubs determined in the first threshold estimation, i.e., for two

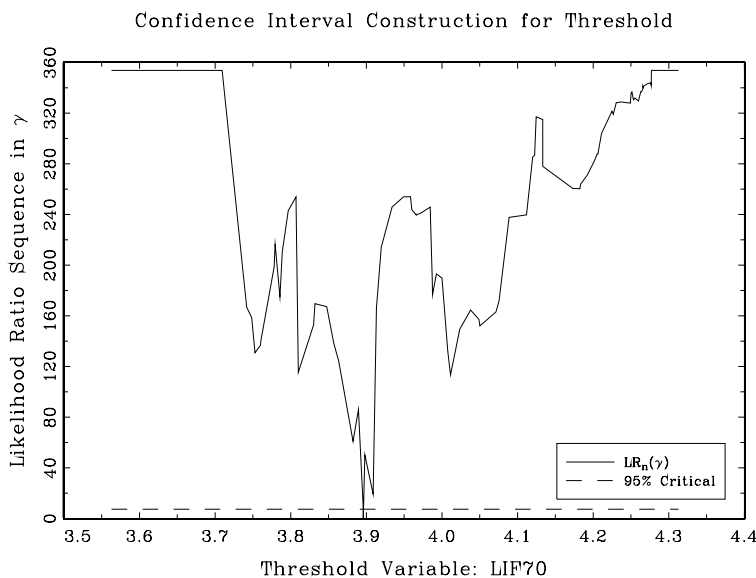


Figure 1: Normalized likelihood ratio sequence as a function of the threshold (γ) in life expectancy.

clubs.⁶ Results for all three clubs are not available yet. In the full sample, initial income, schooling, and effective depreciations are statistically significant. In particular, the negative coefficient for the initial income indicates that conditional convergence exists in the data. The importance of the initial income varies across clubs being, however, insignificant only in the high-fertility club. A closer exploration shows that this club contains countries with considerable breaks in their economic trends, causing non-linearities between initial incomes and growth rates. These breaks are discussed later in this paper. An expected result is that the effective depreciation in the fertility-based clubs is not significant since fertility apparently measures the same dimension as population growth n . On the other hand, initial schooling is significant only in the low-fertility club, where its coefficient is much larger than in the full sample.

⁶Estimation with Gauss, code provided by Hansen (2000).

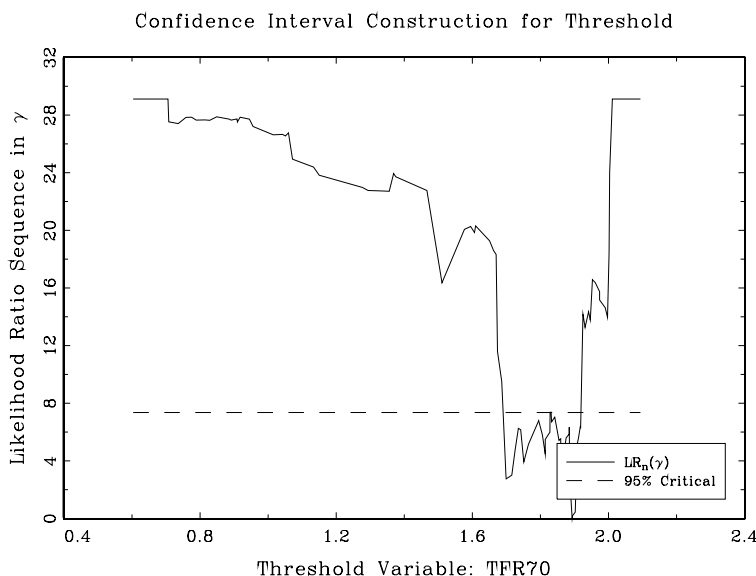


Figure 2: Normalized likelihood ratio sequence as a function of the threshold (γ) in total fertility

4 Results II: The Unit Root Tests

This section reports convergence of incomes within the demographic clubs. This preliminary version supplies results only from fertility-based clubs. All three clubs are analyzed. In later versions, life expectancy-based clubs will be analyzed as well. We first deal with the problem of cross-section dependency and perform the adequate dependency tests. As the second topic, we deal with the potential breaks within the clubs.

4.1 Cross-section Dependency

To evaluate the presence of cross-section dependence, we ran the ADF(p) regressions with individual values for p to compute the pair-wise cross-section correlations for the residuals (Pesaran 2007a). Table 3 shows that the CD statistics are -0.47, -2.51, and 3.22 for Clubs I-III, respectively.⁷ The value

⁷Since we are testing the convergence hypothesis, we ran the ADF(p) regressions for the demeaned data.

for the first club is not significant at 5 % level, while the values for the last two clubs are highly significant. Hence, the CD test indicates strong cross-section dependence in Clubs 2 and 3. The LM test statistics are all high and significant although the clubs are probably too large to yield reliable results. Hence, there seems to be some cross-section dependence on the data, rendering the use of second generation tests.

Table 3: Cross-section dependence in fertility-based Clubs 1 – 3

Test	N	CD-test	LM-test	d.f.
Club 1	26	-0.47 (-1.96)	580.4 (129.6)	325
Club 2	22	-2.51 (-1.96)	354.2 (129.6)	231
Club 3	53	3.22 (-1.96)	2539.1 (129.6)	1378

Table 4 first reports the results for conditional convergence (*Model 2*) and the for (*Model 3*). The IPS as well as Pesaran’s CIPS are both far from being statistically significant. None one of them supports convergence.

Table 4: Results for *Model 2-3*

Test	IPS (<i>Model 2</i>)	CIPS (<i>Model 2</i>)	IPS (<i>Model 3</i>)	CIPS (<i>Model 3</i>)
Club 1	-2.10 (-2.36)	-1.84 (-2.65)	-1.63 (-1.73)	-1.48 (-2.16)
Club 2	-2.21 (-2.44)	-2.15 (-2.65)	-1.51 (-1.81)	-1.59 (-2.16)
Club 3	-2.18 (-2.31)	-2.01 (-2.58)	-1.46 (-1.67)	-1.38 (-2.10)

4.2 Tests with Breaks

According to the Lee and Strazicich’s (2003) minimum LM unit root test, there are (at least) two statistically significant break points in the trend of

the series of all 3 clubs. According to the test, there is a break in the trend of the series of club 1 in 1988 and in 1996,⁸ a break in the trend of the series of club 2 in 1979 and in 1988,⁹ and a break in the trend of the series of club 3 in 1990 and in 2000.¹⁰

Fixed effects estimation is used to mitigate the effect of possible cross-sectional dependence within clubs. Table 5 reports the results of the conditional convergence (*model 1*) assuming no break, 1 break, and 2 breaks in the time trend of the tested series.

Table 5: Panel unit root tests allowing for structural shifts (*model 1*)

Test	ILT (no break)	ILT (1 break)	ILT (2 breaks)
Club 1	-0.255 (-1.919)	-4.375* (-1.919)	-25.052* (-1.919)
Club 2	0.286 (-1.980)	-12.195* (-1.980)	-22.529* (-1.980)
Club 3	0.698 (-1.797)	-16.944* (-1.797)	-33.934* (-1.797)

H_0 = unit root. * = statistically significant at the 5% or higher level. The values presented without brackets denote the value of *LM*-statistics. The critical values of the test statistics for 5% level are presented in parentheses. ILT test statistics is estimated using time fixed effects. The maximum lag length is set to 1. Serial correlation in the residuals is corrected using Amsler and Lee's (1995) method.

Results of the ILT test are valid for club 1, which was found to be cross-sectionally independent in the previous section. The results of clubs 2 and 3, however, are more in doubt, because both clubs were found to include strong cross-sectional dependency.

⁸Minimum LM test statistic for a two breaks is -6.1034. The 5% critical value (with $T=100$) is -4.19.

⁹Minimum LM test statistic for a two breaks is -5.1717. The 5% critical value (with $T=100$) is -4.31.

¹⁰Minimum LM test statistic for a two breaks is -5.9156. The 5% critical value (with $T=100$) is -4.19.

4.3 Summary of Unit Root Tests

When no break in the time trend is allowed, the results of ILT test are in line with Pesaran's (2007) test. That is, the ILT test finds all the tested series to be $I(1)$. However, when 1 or 2 breaks in the time trend are allowed, the test finds all the tested series to be trend-stationary.

5 Discussion

This paper evaluates the role of demographics in post-war growth and convergence. Different timing of the demographic transition has segmented countries into different regimes and their simultaneous existence makes the concept of convergence meaningless if neglected. This paper classifies countries into demographic clubs by the Hansen method and applies unit root convergence tests to the clubs. The unit root tests range from the traditional tests to the second generation tests.

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A Appendix: Data and Clubs

Country	growth	Y/L	school	I/Y	n+g+d	tfr	lif	imr	dep	Ctfr	Clif
Afghanistan	-0.37	862.79	11.80	8.98	7.53	7.70	35.26	215.00	86.13	1	1
Albania	1.67	2547.41	52.75	48.52	7.39	4.84	67.11	77.00	88.04	3	3
Argentina	0.92	10879.45	93.00	23.15	6.66	3.11	66.80	56.50	57.03	3	3
Australia	2.11	16646.12	100.00	31.60	7.16	2.86	71.02	17.90	59.21	3	3
Austria	2.39	14873.88	100.00	32.13	5.45	2.29	69.89	25.90	62.44	3	3
Bahamas	0.76	19017.75	91.30	12.74	7.26	3.58	66.16	38.00	88.92	3	3
Bangladesh	1.11	1552.33	24.10	6.40	7.66	6.33	44.55	158.70	91.50	2	1
Belgium	2.21	14933.20	100.00	31.75	5.36	2.20	71.21	21.10	58.53	3	3
Benin	0.96	990.46	10.80	11.78	7.62	7.05	46.12	151.30	95.60	1	1
Bolivia	0.73	2887.23	57.80	12.44	7.47	6.52	46.07	147.00	86.48	2	1
Brazil	1.91	4761.18	68.20	18.15	7.66	4.98	58.88	103.00	85.25	3	3
Brunei	-0.37	58060.74	57.00	2.46	11.87	5.62	67.03	57.50	87.15	3	3
Bulgaria	3.53	2642.71	92.50	34.23	5.55	2.17	71.26	27.30	47.97	3	3
Burkina Faso	1.48	798.21	7.00	5.29	6.17	7.58	42.45	153.50	91.65	1	1
Burundi	-0.62	810.78	22.30	1.84	7.10	6.80	43.78	129.66	91.75	1	1
Cameroon	0.89	1873.68	31.30	6.89	7.11	6.22	46.15	127.00	85.30	2	1
Canada	2.15	16323.60	100.00	21.69	6.26	2.26	72.70	18.80	61.29	3	3
Central Africa	-1.18	1337.03	14.30	11.72	7.40	5.71	42.63	141.77	81.01	3	1
Chile	2.59	7038.52	88.20	22.93	6.82	3.95	62.38	78.00	80.95	3	3
Colombia	1.85	3925.59	78.00	15.74	7.59	5.47	61.05	67.34	97.33	3	3
Congo. De. Re.	-4.12	1789.77	22.58	4.17	7.74	6.39	45.15	143.08	91.90	2	1
Congo. Re.	1.32	2048.88	32.90	7.09	7.59	6.25	53.76	87.97	88.90	2	2
Costa Rica	1.65	6422.58	88.20	18.20	7.85	4.93	67.11	62.00	97.65	3	3
Cote d'Ivoire	-0.27	2461.25	15.80	11.59	10.15	7.37	48.89	157.51	88.99	1	1
Cuba	2.15	5033.08	89.40	7.44	6.47	3.88	70.05	38.70	76.70	3	3
Cyprus	3.70	6383.67	83.50	52.70	5.84	2.60	70.97	26.00	69.94	3	3
Denmark	2.02	16266.72	100.00	27.51	5.69	1.95	73.34	14.20	55.20	3	3
Dominica	3.00	1625.64	67.10	30.36	6.48	6.09	58.64	92.09	101.42	2	3
Egypt	3.14	1785.08	31.40	7.40	6.80	6.14	50.39	157.90	83.95	2	2
El Salvador	0.80	4162.92	58.00	13.58	7.91	6.31	57.34	111.00	96.65	2	2
Ethiopia	0.43	947.06	12.60	5.12	7.12	6.81	42.96	142.40	91.74	1	1
Finland	2.40	13373.00	100.00	41.38	5.13	1.83	70.18	13.40	50.97	3	3
France	1.86	14878.90	100.00	31.93	5.98	2.48	72.01	18.20	60.50	3	3
Gambia	0.07	1378.33	9.70	6.03	8.25	6.65	37.32	179.70	81.45	1	1
Germany	1.90	15490.93	100.00	33.52	5.73	2.03	70.46	22.50	58.51	3	3
Ghana	0.76	1249.82	29.50	18.18	8.09	6.70	49.20	110.11	90.07	1	1

Continued

Country	growth	Y/L	school	I/Y	n+g+d	tfr	lif	imr	dep	Ctfr	Clif
Greece	2.24	12122.95	86.70	40.42	5.43	2.34	71.84	28.30	56.28	3	3
Guatemala	1.06	4121.28	45.20	20.53	7.26	6.24	52.37	115.00	90.51	2	2
Haiti	-0.11	1648.19	22.20	7.14	5.97	5.76	47.31	148.67	83.47	3	1
Honduras	1.17	2393.46	53.40	25.98	8.39	7.20	52.77	115.51	103.34	1	2
Hungary	2.43	6999.81	98.10	22.88	5.27	1.97	69.16	35.90	47.85	3	3
India	3.06	1231.52	33.10	13.42	7.27	5.40	49.30	128.70	78.91	3	2
Ireland	3.84	10058.84	100.00	33.55	5.95	3.93	71.09	19.50	73.46	3	3
Israel	1.91	11873.27	87.40	36.59	8.17	3.78	71.21	24.10	66.05	3	3
Italy	2.05	13479.40	94.50	33.81	5.64	2.43	71.56	29.60	54.96	3	3
Jamaica	0.12	7848.86	67.50	36.99	6.19	5.31	68.36	47.66	110.71	3	3
Japan	2.12	13972.80	100.00	42.70	6.29	2.14	71.95	13.10	45.13	3	3
Jordan	0.29	4636.04	54.10	7.15	8.48	7.87	54.60	77.00	96.03	1	2
Kenya	0.42	1730.90	40.80	16.88	8.37	8.05	52.47	96.00	110.81	1	2
Korea. Re.	5.58	3029.68	86.80	24.41	6.97	4.53	61.84	43.00	83.04	3	3
Laos	3.17	705.42	17.09	6.60	7.06	6.42	46.09	145.00	87.64	2	1
Lebanon	-1.56	13794.21	63.30	10.03	10.96	5.00	64.84	45.00	88.86	3	3
Liberia	-4.27	1873.32	18.40	15.42	7.98	6.90	42.17	190.18	92.62	1	1
Luxembourg	3.30	22962.78	100.00	32.51	5.95	1.98	70.34	24.90	53.05	3	3
Madagascar	-0.70	1109.33	38.68	6.42	7.26	6.74	44.07	109.00	92.15	1	1
Malawi	1.90	621.40	37.90	38.01	7.68	7.32	40.82	199.50	96.03	1	1
Malaysia	4.79	3040.88	58.30	16.93	7.37	5.47	61.55	46.00	92.35	3	3
Mali	1.84	643.75	6.30	6.20	7.24	7.47	39.44	224.10	90.41	1	1
Malta	4.28	4299.91	77.70	62.76	4.97	2.03	70.12	25.60	58.03	3	3
Mauritania	0.57	1865.36	26.00	14.34	6.63	6.58	47.63	138.10	91.58	2	1
Mauritius	3.99	4569.16	67.00	7.94	6.38	3.65	62.39	61.60	86.37	3	3
Mexico	1.61	6168.70	74.90	25.44	8.05	6.64	61.71	79.00	100.87	2	3
Morocco	1.66	2927.57	19.70	14.74	7.51	6.97	51.89	119.00	107.22	1	2
Mozambique	1.50	1274.12	16.60	3.65	7.49	6.59	39.43	185.21	86.49	2	1
Namibia	0.36	5597.36	57.00	22.54	8.59	6.48	52.77	73.15	86.16	2	2
Nepal	1.37	1164.60	16.10	5.37	6.96	5.84	42.96	158.16	81.58	2	1
Netherlands	1.83	17506.19	100.00	32.78	6.23	2.57	73.59	12.00	59.87	3	3
New Zealand	1.49	14651.13	100.00	22.92	6.66	3.16	71.27	16.70	67.33	3	3
Nicaragua	-1.53	3834.22	56.90	30.37	8.24	6.85	53.90	113.00	101.75	1	2
Niger	-1.26	1368.30	5.70	7.53	7.21	8.12	40.64	150.00	103.42	1	1
Norway	2.86	16785.87	100.00	41.01	5.66	2.50	74.09	12.00	59.65	3	3
Oman	2.50	9809.44	18.50	4.52	8.04	7.20	50.06	126.00	102.67	1	2
Pakistan	2.53	1405.42	20.70	17.79	7.68	6.60	51.11	137.70	85.43	2	2
Panama	2.59	3504.04	79.10	34.49	7.75	5.21	65.59	46.00	93.02	3	3
New Guinea	1.30	1364.44	41.28	41.02	7.80	6.14	43.73	107.60	84.14	2	1

Continued

Country	growth	Y/L	school	I/Y	n+g+d	tfr	lif	imr	dep	Ctfr	Clif
Paraguay	1.28	2936.23	79.80	9.39	7.70	5.67	65.52	56.30	98.35	3	3
Peru	0.57	5192.35	71.60	13.60	7.81	6.22	53.91	116.54	90.37	2	2
Philippines	1.64	2615.68	83.60	15.46	7.85	6.20	57.41	58.37	93.22	2	3
Poland	2.53	5685.21	98.20	23.56	5.77	2.20	69.87	31.10	54.34	3	3
Portugal	2.60	7691.73	73.60	33.27	4.40	2.76	67.42	53.70	61.18	3	3
Romania	2.83	3261.73	93.20	36.11	6.07	2.89	68.49	43.50	52.73	3	3
Samoa	0.92	4123.86	65.92	30.95	7.10	6.02	55.22	73.05	97.77	2	2
Senegal	-0.24	2078.71	14.70	3.55	8.02	7.00	45.01	113.80	86.16	1	1
South Africa	1.07	7055.25	69.80	15.41	7.60	5.56	53.02	80.26	83.54	3	2
Spain	2.70	11584.61	91.50	33.47	5.94	2.84	72.03	28.10	60.58	3	3
Sri Lanka	3.25	1815.54	80.50	22.31	6.97	4.33	64.91	65.00	77.21	3	3
Sudan	1.67	1228.88	25.50	12.96	7.82	6.60	44.21	102.17	87.81	2	1
Sweden	1.76	17152.82	100.00	28.67	5.69	1.94	74.65	11.00	52.70	3	3
Switzerland	1.10	24837.39	100.00	35.55	6.21	2.09	73.02	15.40	54.13	3	3
Syria	2.21	1292.82	41.10	7.12	8.46	7.55	55.90	89.77	103.65	1	2
Tanzania	1.12	609.89	37.20	10.86	8.07	6.77	46.88	128.60	95.01	1	1
Thailand	4.27	1939.44	80.30	39.79	7.95	5.33	59.66	73.89	91.32	3	3
Togo	-1.15	1329.17	26.20	15.01	7.29	7.05	48.54	123.10	92.96	1	1
Tunisia	3.34	2936.12	27.40	29.43	6.92	6.42	54.19	135.00	100.01	2	2
Turkey	2.21	3414.06	56.80	18.04	7.27	5.27	56.70	150.00	84.60	3	2
Uganda	0.16	1102.97	36.10	3.52	7.69	7.11	49.85	116.62	97.87	1	2
United Kngd	2.25	14004.10	100.00	22.00	5.49	2.44	71.97	18.00	59.02	3	3
United States	2.10	19696.58	100.00	20.79	6.26	2.48	70.81	20.00	61.77	3	3
Uruguay	1.75	6773.62	92.90	15.84	5.08	2.92	68.75	46.90	58.16	3	3
Zambia	-0.89	2753.60	47.80	32.75	7.41	7.42	49.19	107.74	96.32	1	1
Zimbabwe	-0.88	2627.48	57.50	21.39	7.89	7.40	55.02	82.03	105.33	1	2