

Can Education Compensate the Effect of Population Aging on
Macroeconomic Performance? Evidence from Panel Data
**Supplementary Material for Publication as Online
Appendix**

Rainer Kotschy* Uwe Sunde†
LMU Munich LMU Munich
IZA, Bonn
CEPR, London

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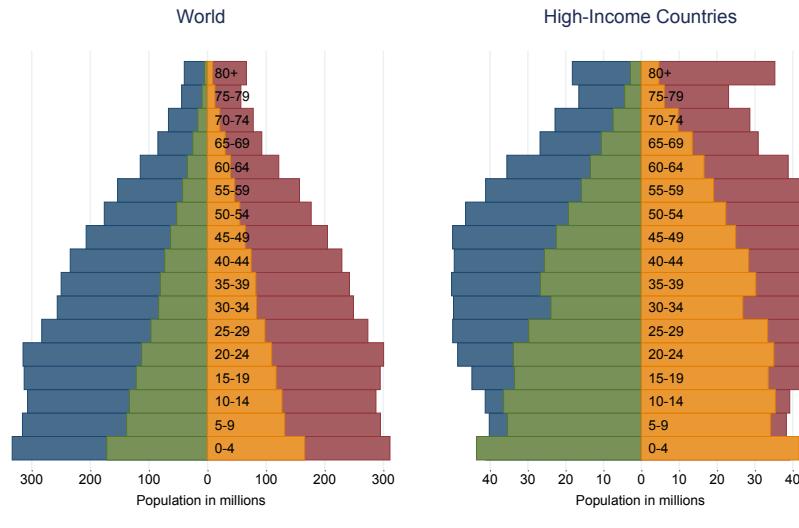
Abstract

This document provides the supplementary results referred to in the paper.

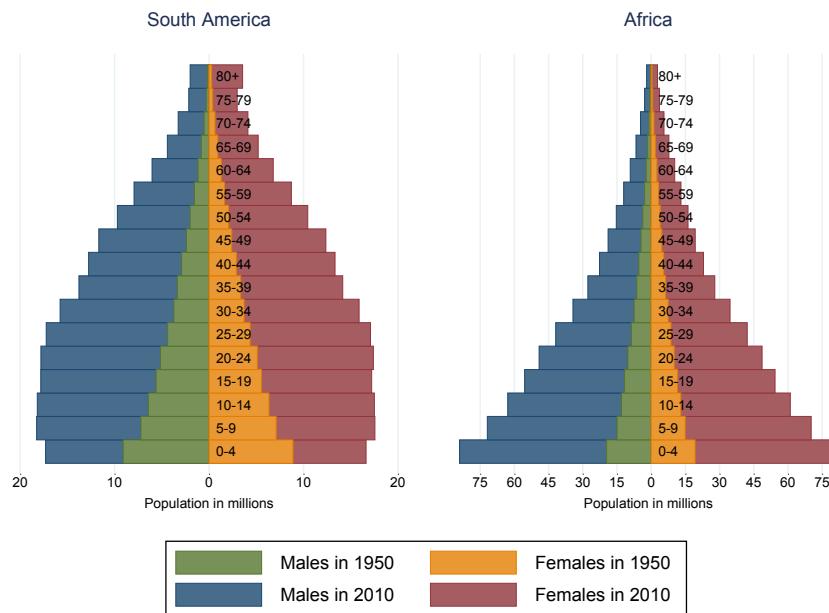
*LMU Munich, Geschwister-Scholl Platz 1, 80539 Munich, Germany, +49 89 2180 1207,
rainer.kotschy@econ.lmu.de.

†Corresponding author. LMU Munich, Geschwister-Scholl Platz 1, 80539 Munich, Germany, +49 89 2180 1280,
uwe.sunde@lmu.de.

Additional Figures



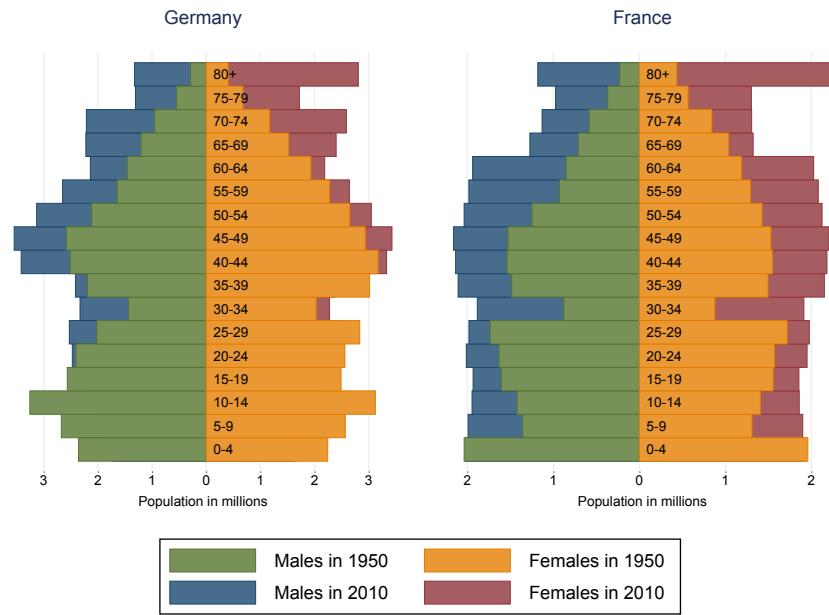
(a) World and High-Income Countries



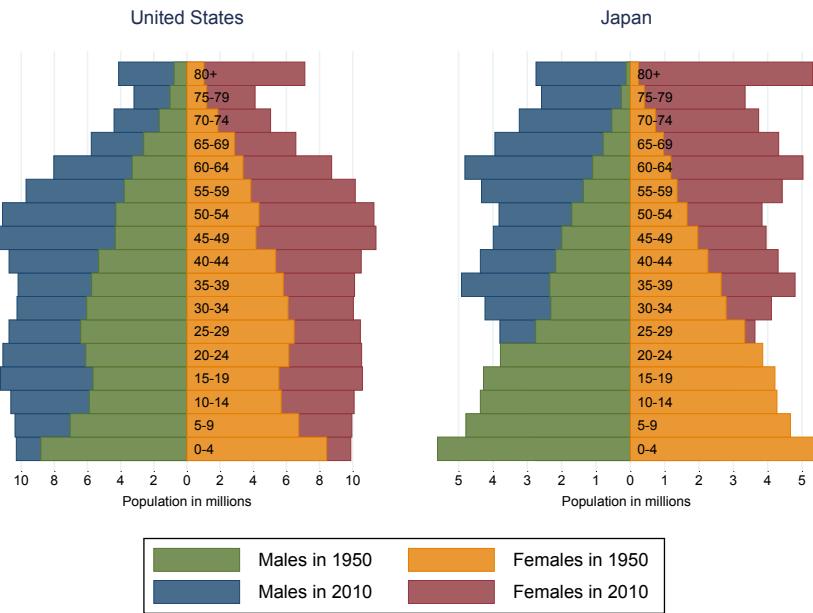
(b) South America and Africa

Figure A1: Population Dynamics – Selected Regions

Data source: United Nations, Department of Economic and Social Affairs (2015).
World Population Prospects: The 2015 Revision.



(a) Germany and France



(b) United States and Japan

Figure A2: Population Dynamics – Selected Countries

Data source: United Nations, Department of Economic and Social Affairs (2015).
World Population Prospects: The 2015 Revision.

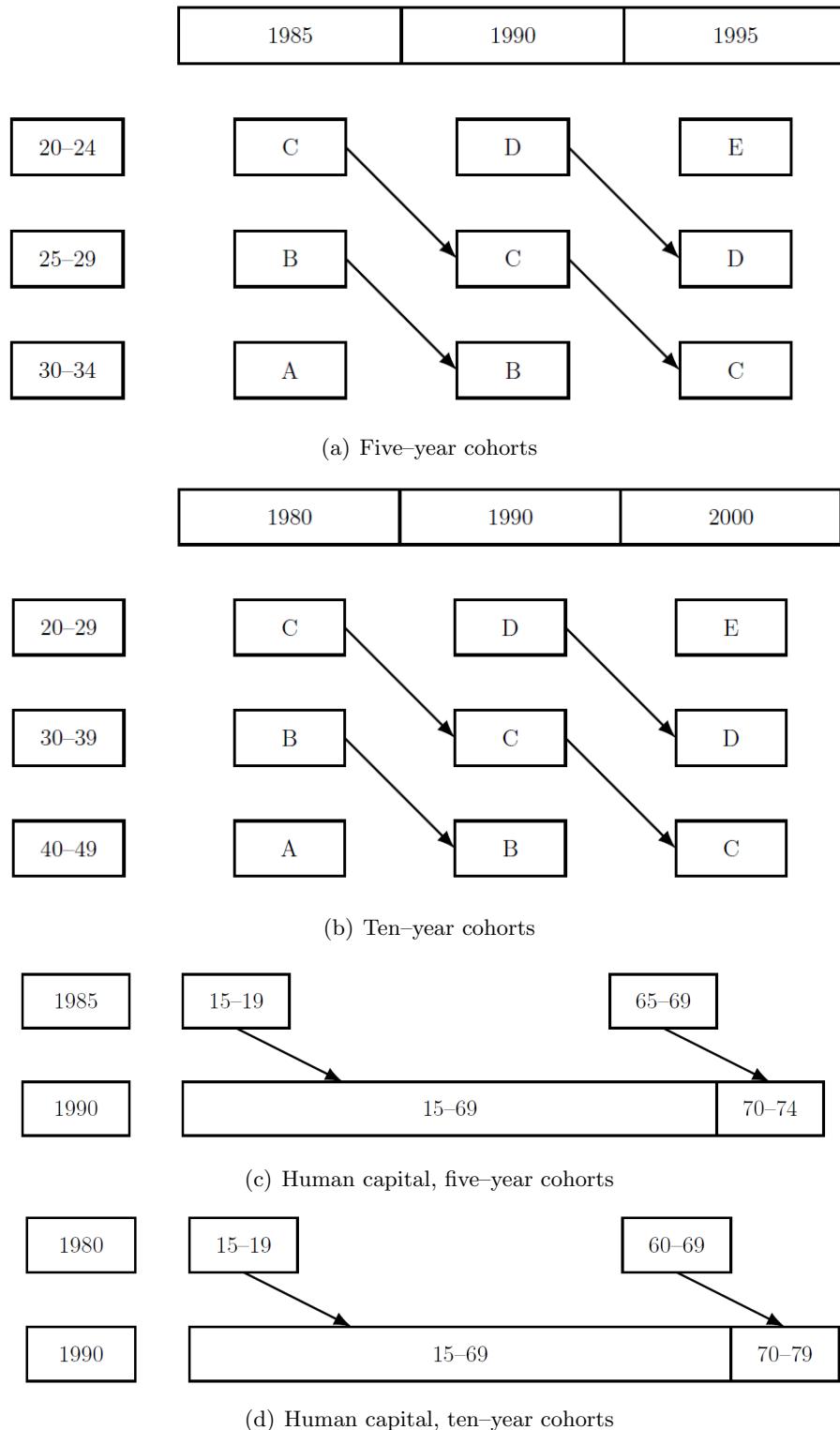


Figure A3: Illustration of Demographic Dynamics as Instrumental Variable

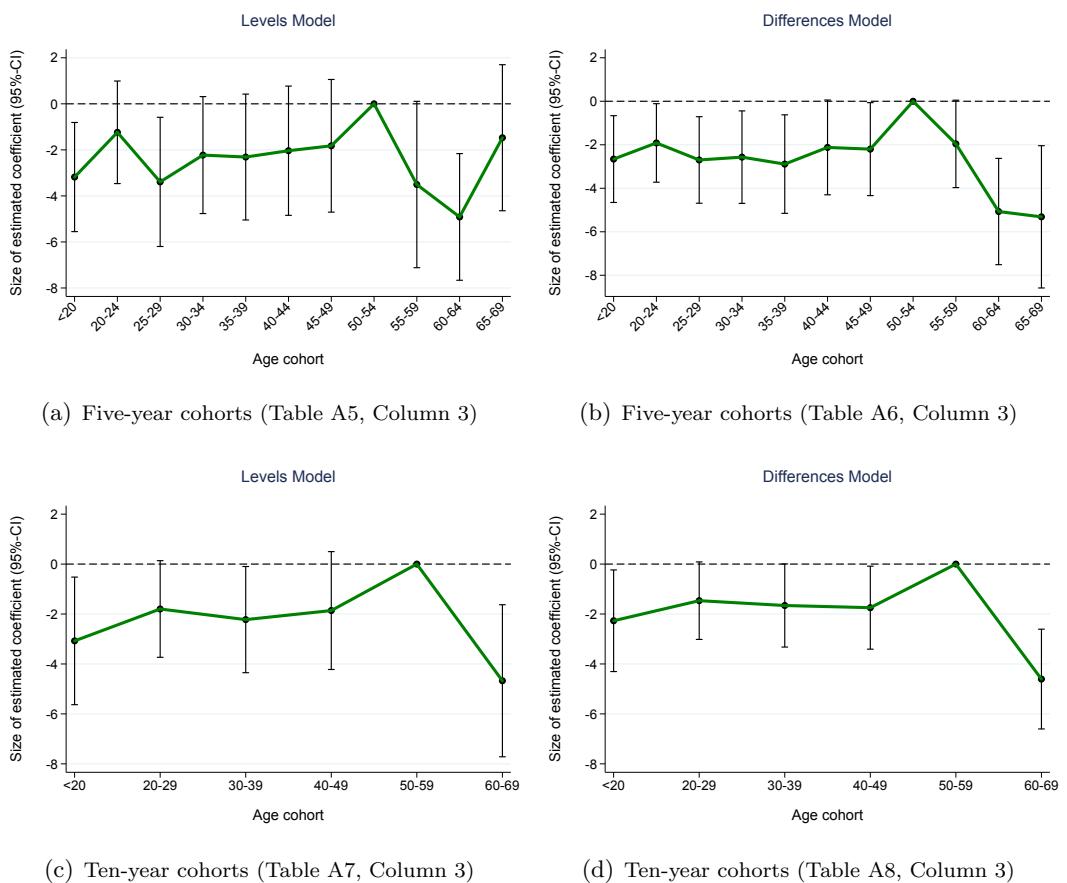


Figure A4: Macro Productivity Profiles: Barro-Lee Data

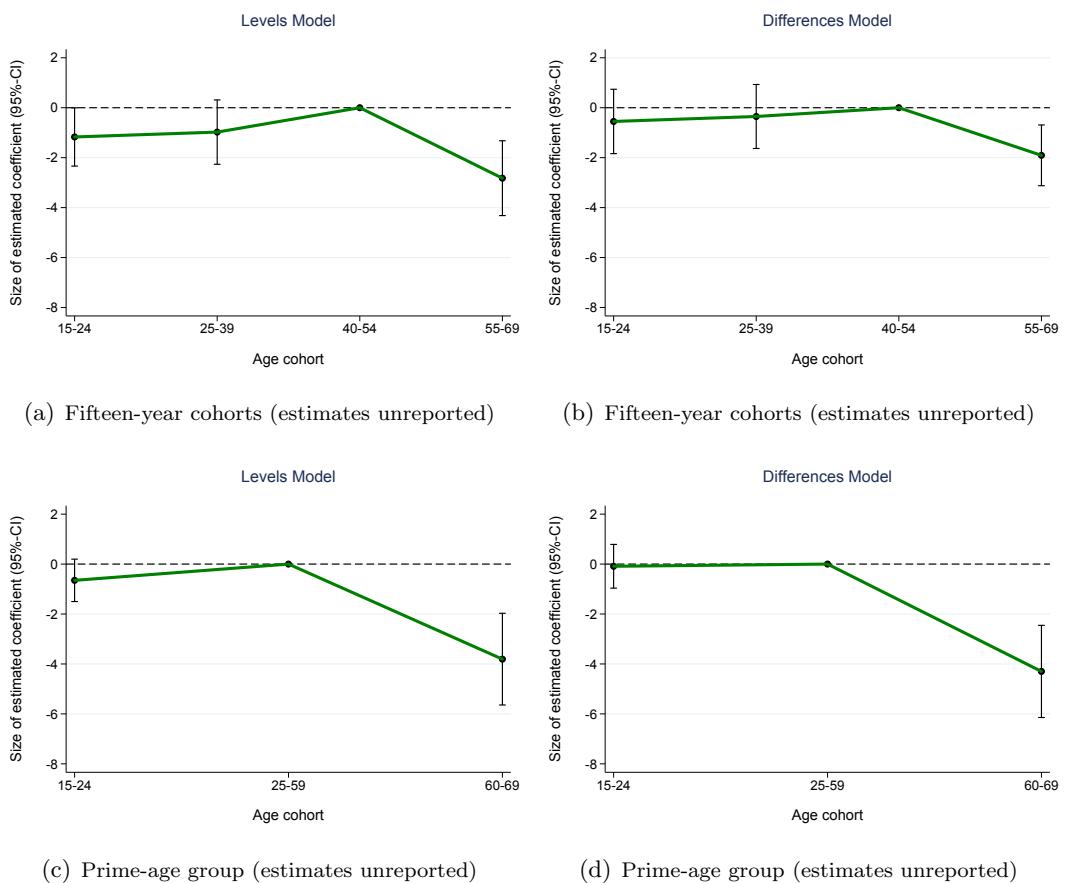


Figure A5: Macro Productivity Profiles (Alternative Cohort Structure)

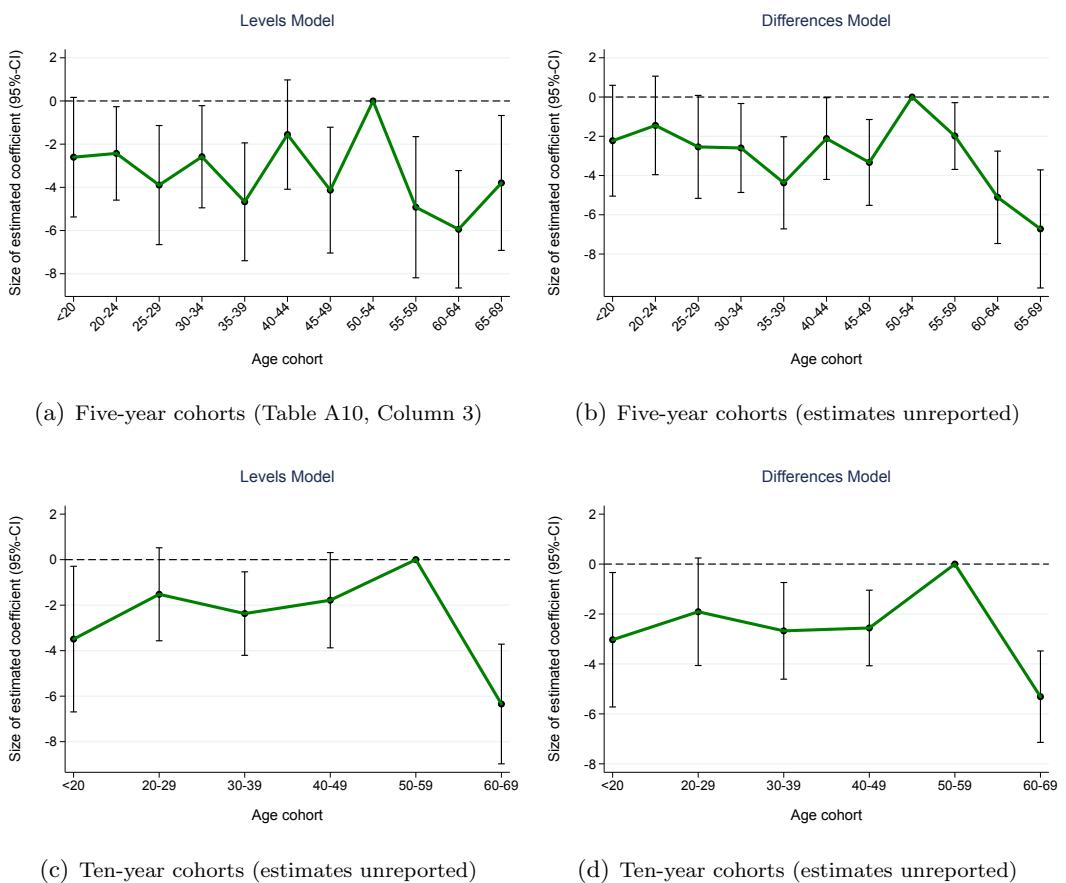


Figure A6: Macro Productivity Profiles: Income Per Capita

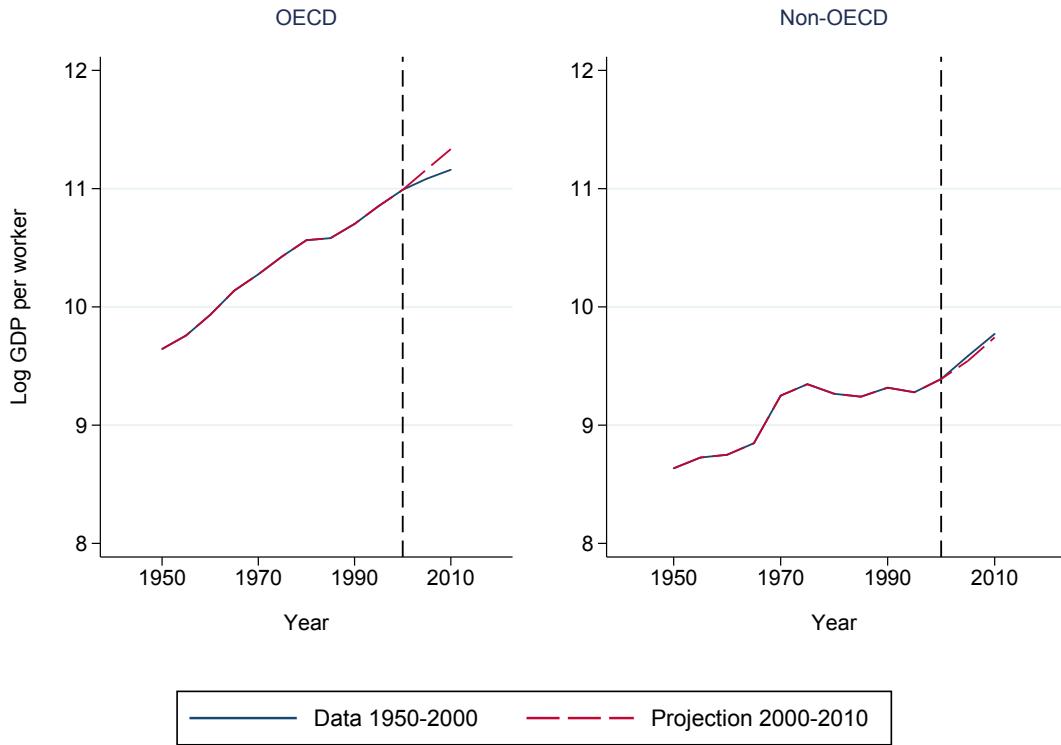


Figure A7: Within-Sample Projection (2000–2010)

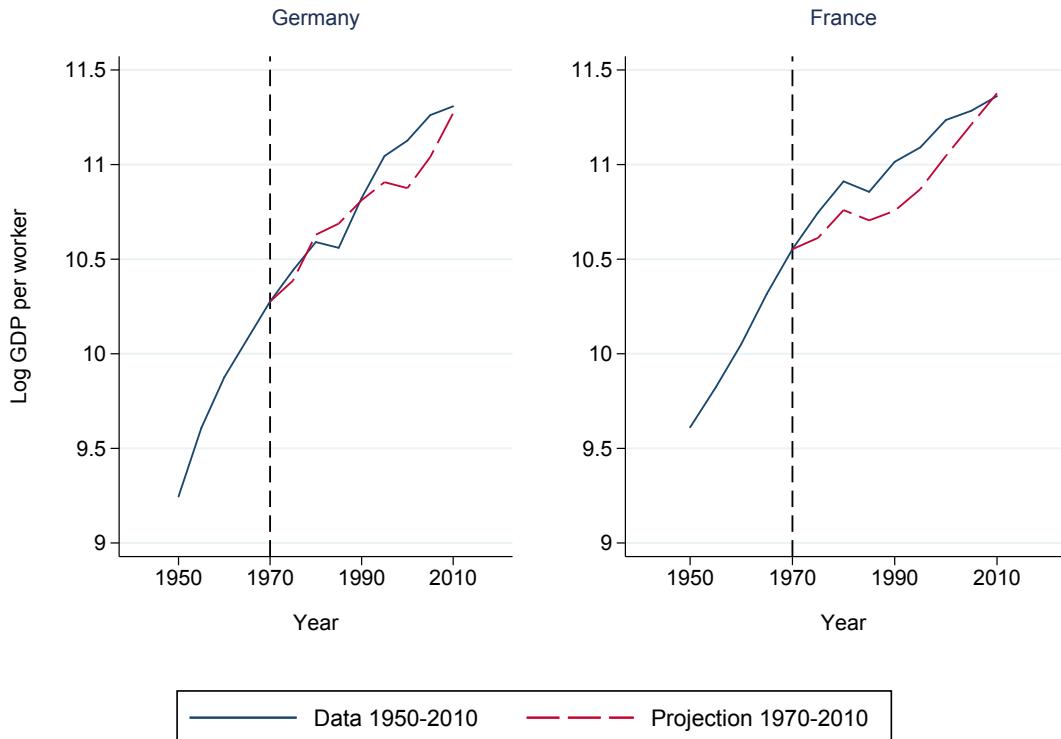


Figure A8: Within-Sample Projection Germany and France (1970–2010)

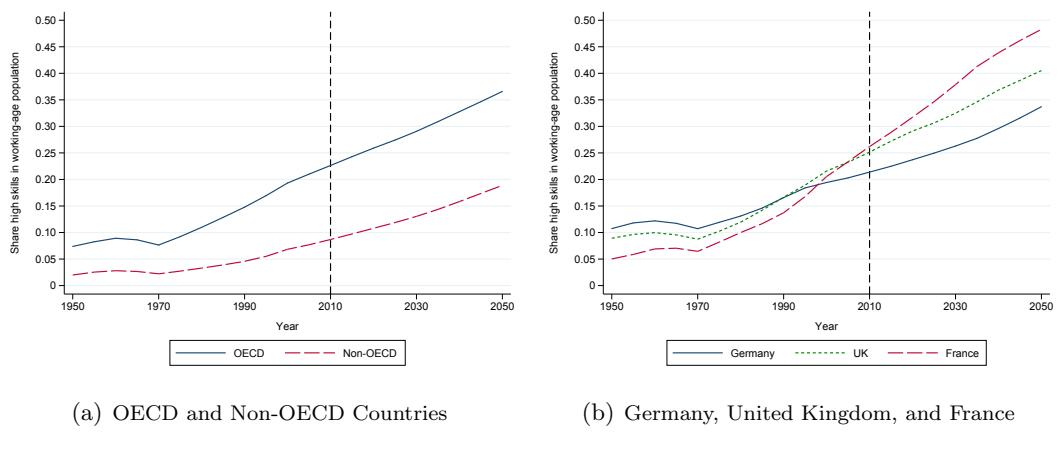
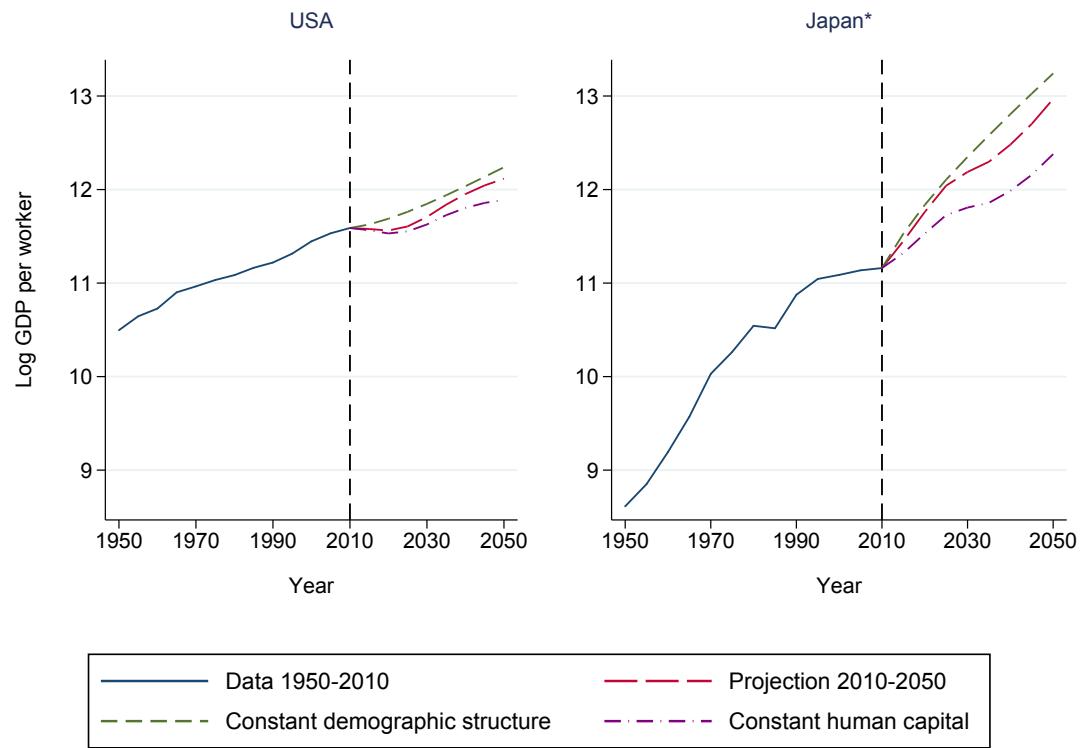
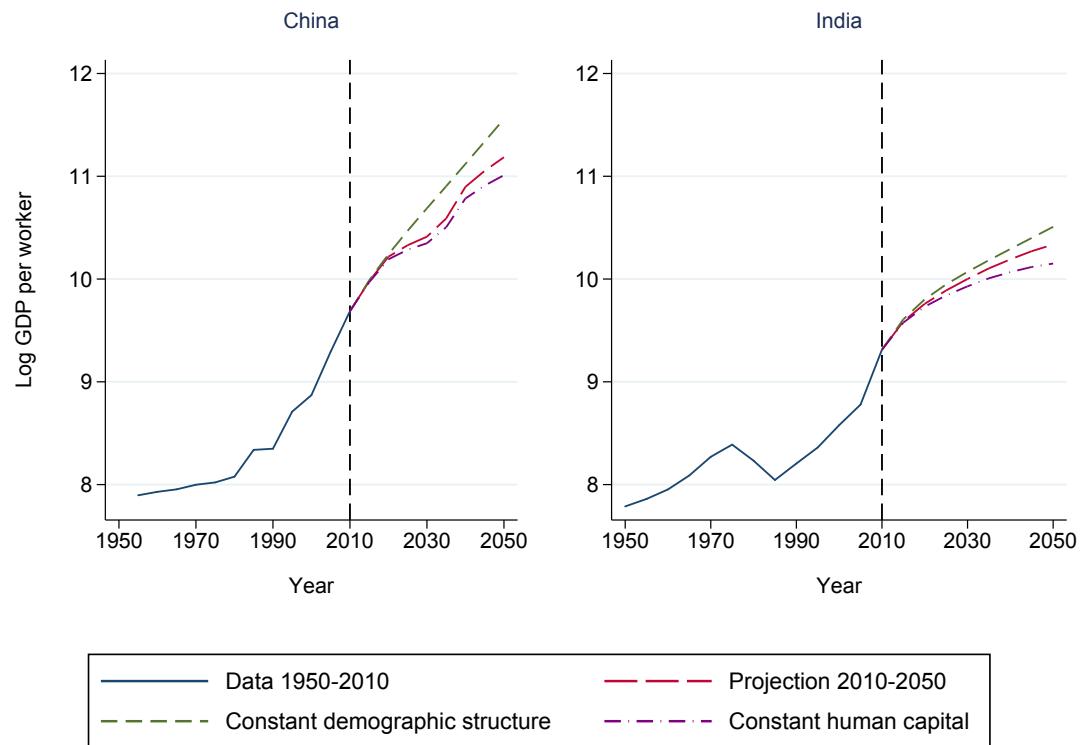


Figure A9: Actual and Projected Educational Attainment

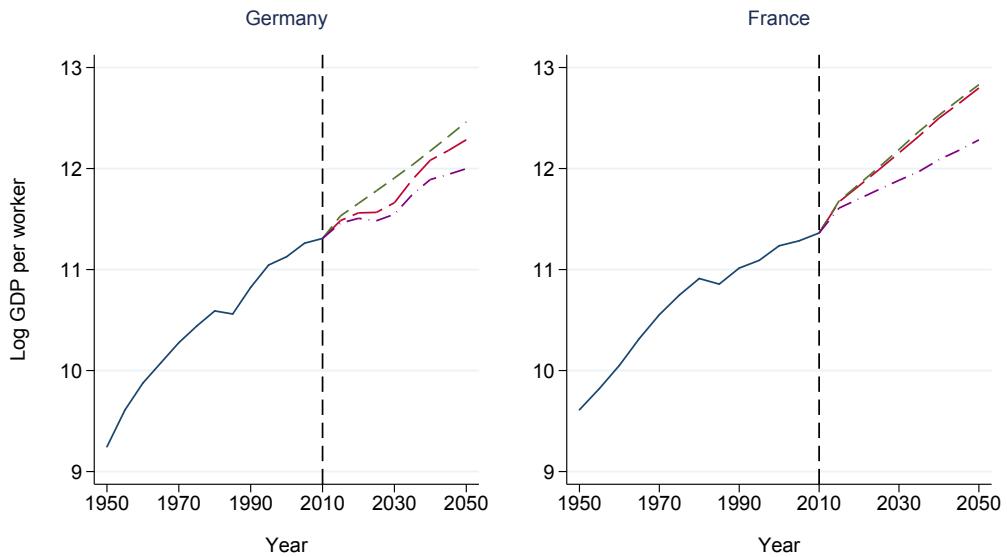


(a) Selected Countries: USA and Japan



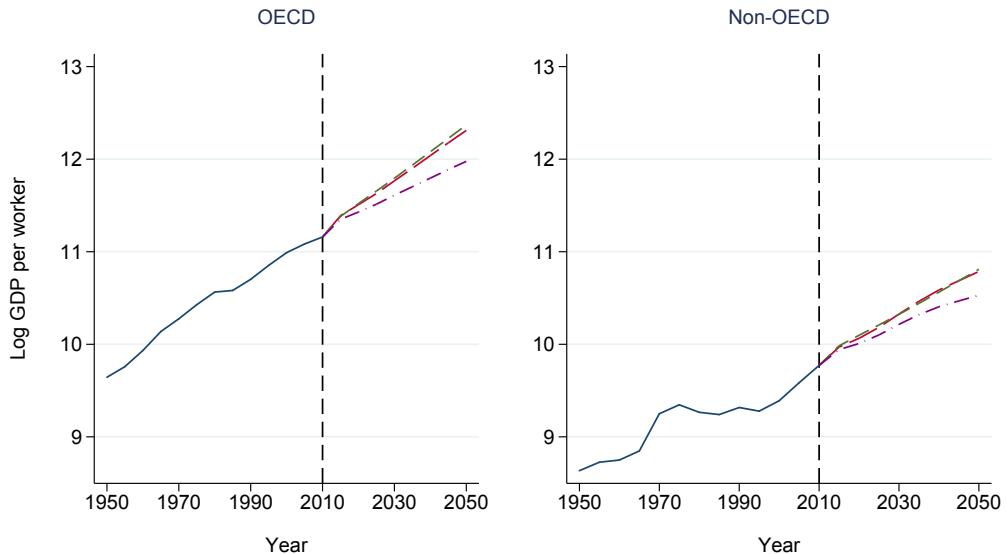
(b) Selected Countries: China and India

Figure A10: Projections under Different Scenarios



— Data 1950-2010	— Projection 2010-2050
- - - Constant demographic structure	- - - Constant human Capital

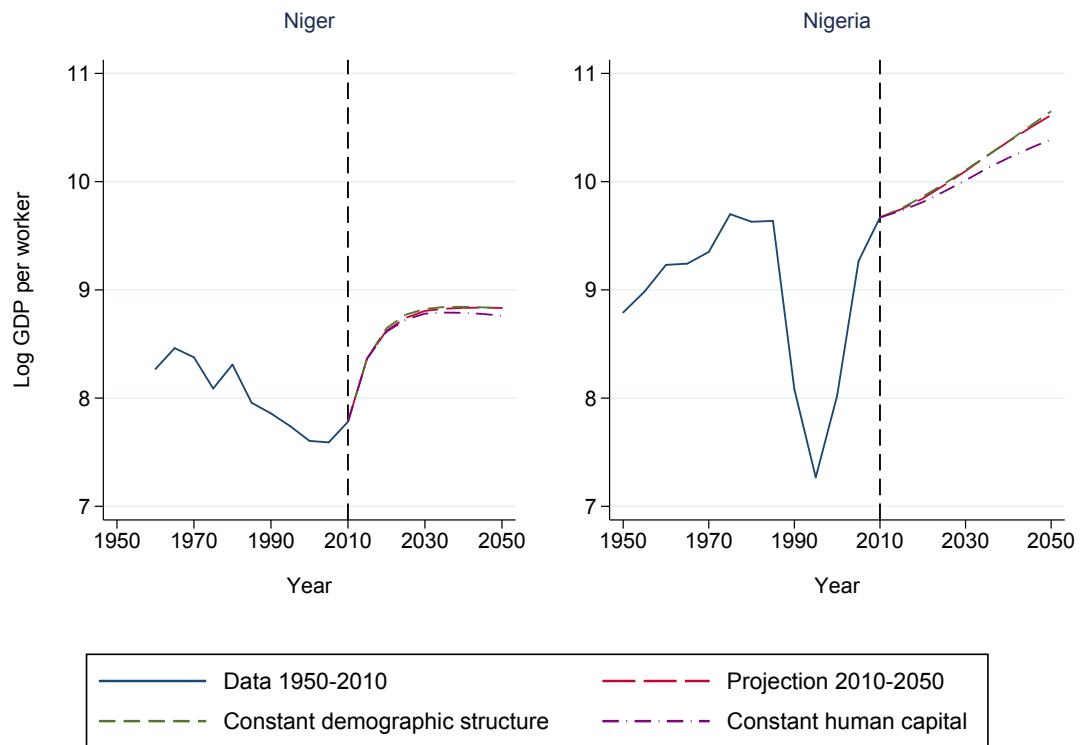
(a) Selected Countries: Germany and France



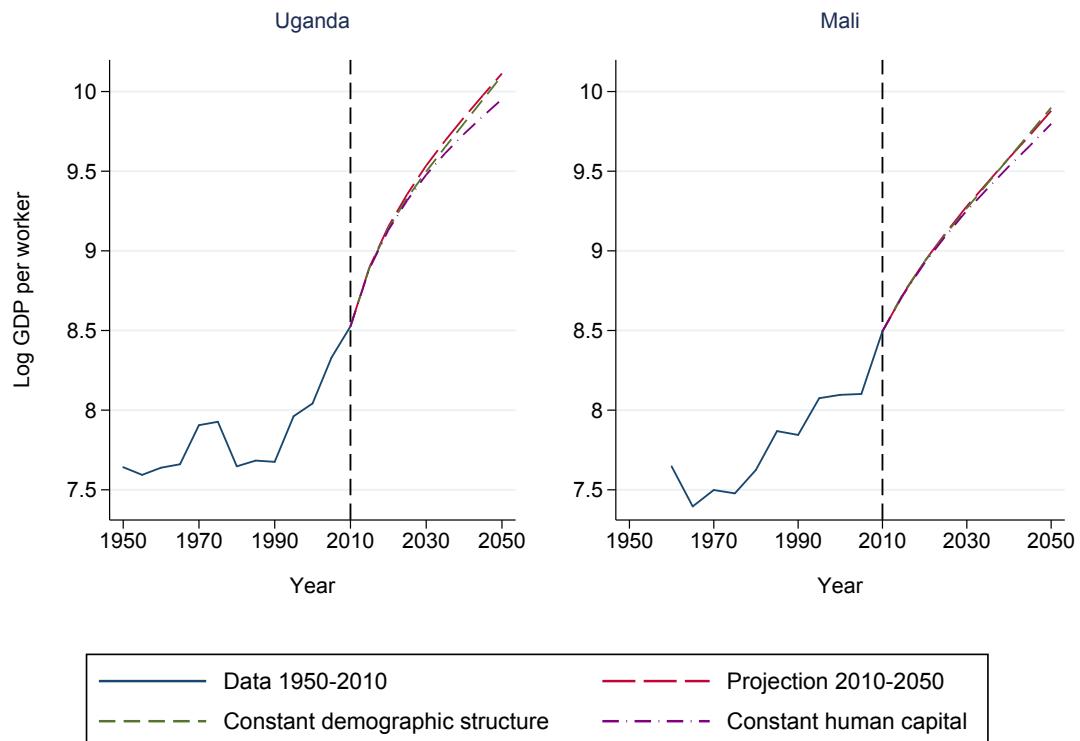
— Data 1950-2010	— Projection 2010-2050
- - - Constant demographic structure	- - - Constant human capital

(b) Selected Regions: OECD and Non-OECD Countries

Figure A11: Projections for Model Without Lagged Dependent Variable

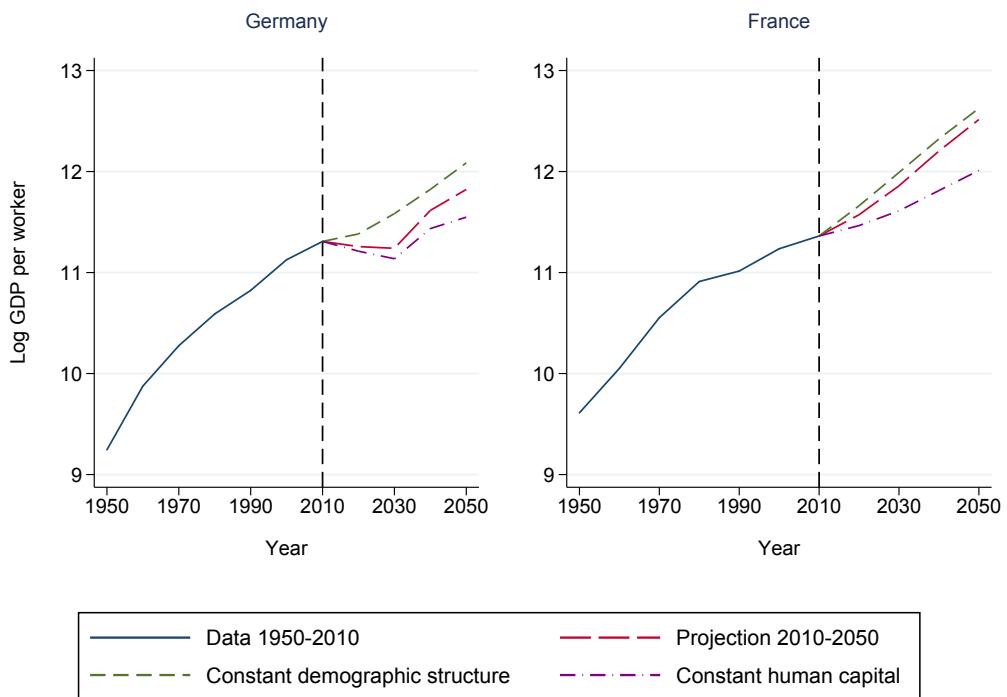


(a) Selected Countries: Niger and Nigeria

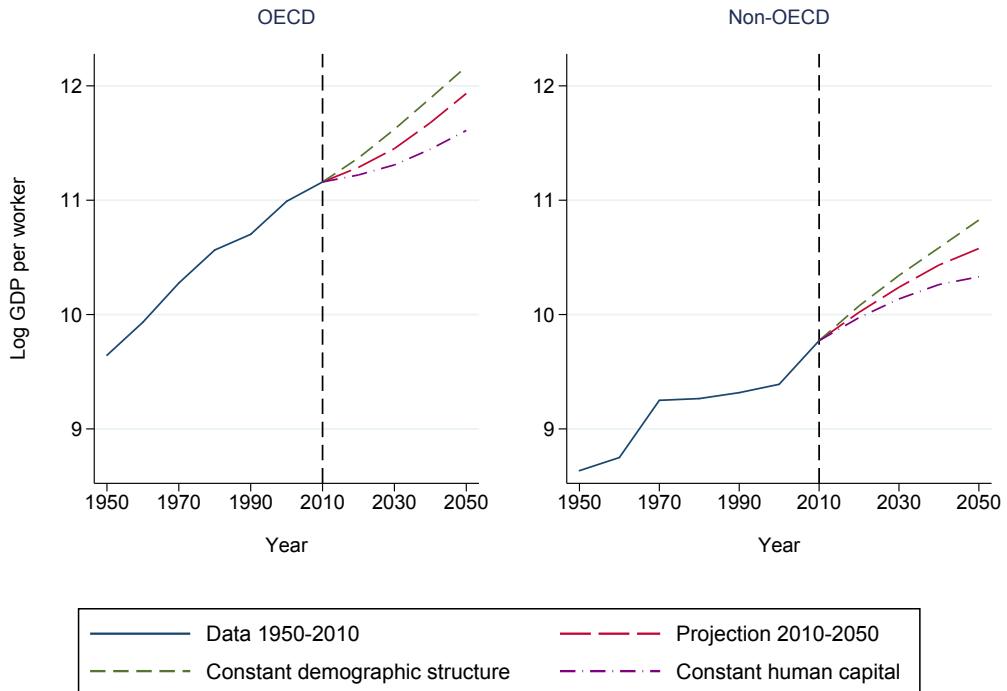


(b) Selected Countries: Uganda and Mali

Figure A12: Projections under Different Scenarios

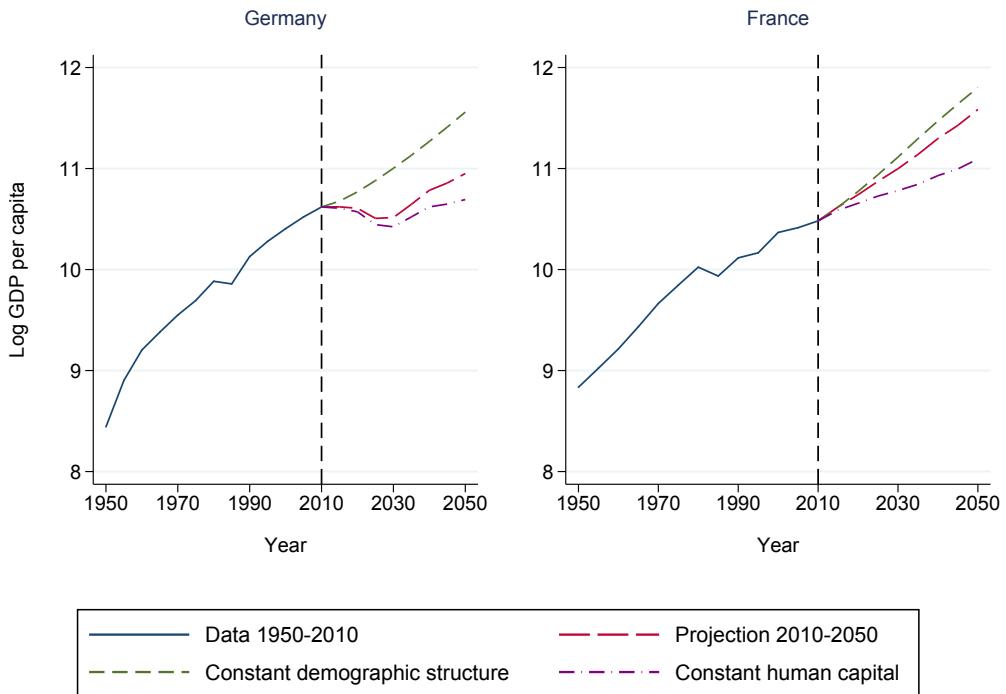


(a) Selected Countries: Germany and France

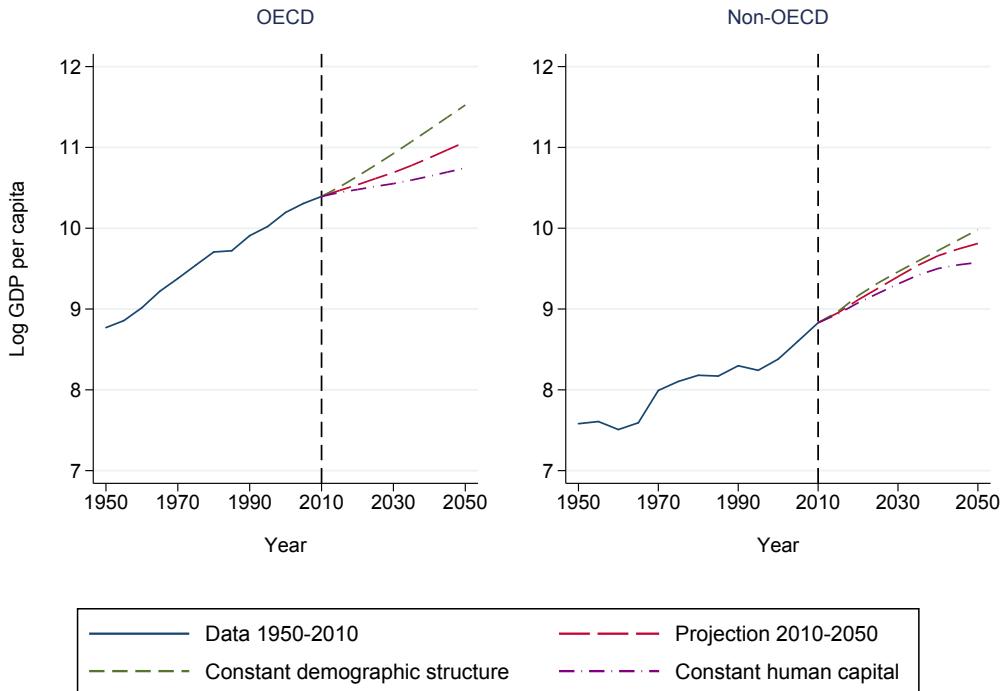


(b) Selected Regions: OECD and Non-OECD Countries

Figure A13: Projections for Model With Prime-Age Group (see Figure A5, Panel b)

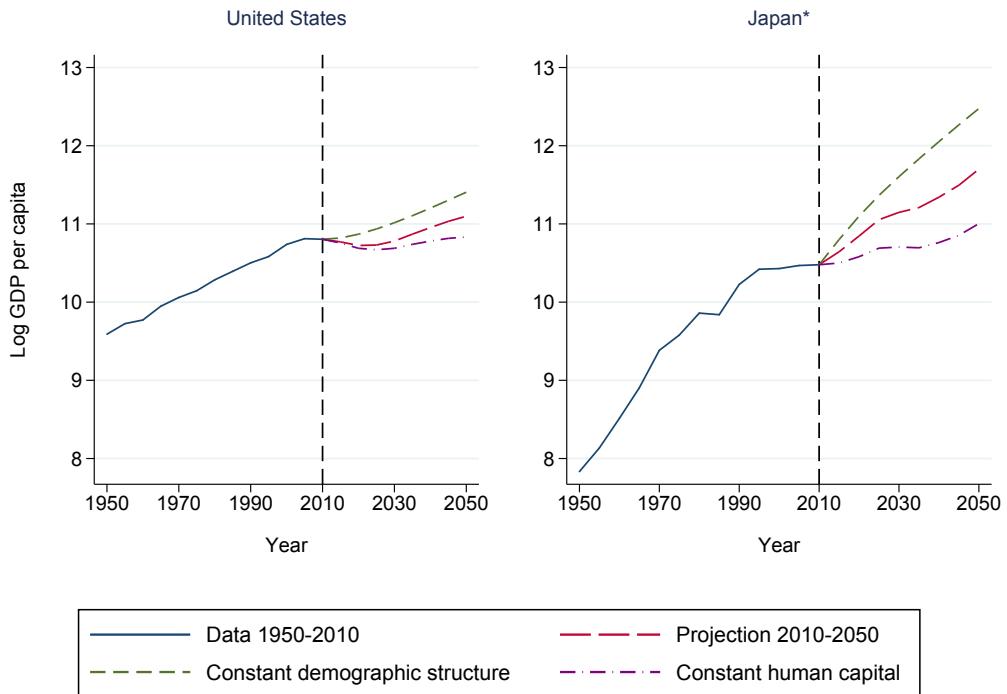


(a) Selected Countries: Germany and France

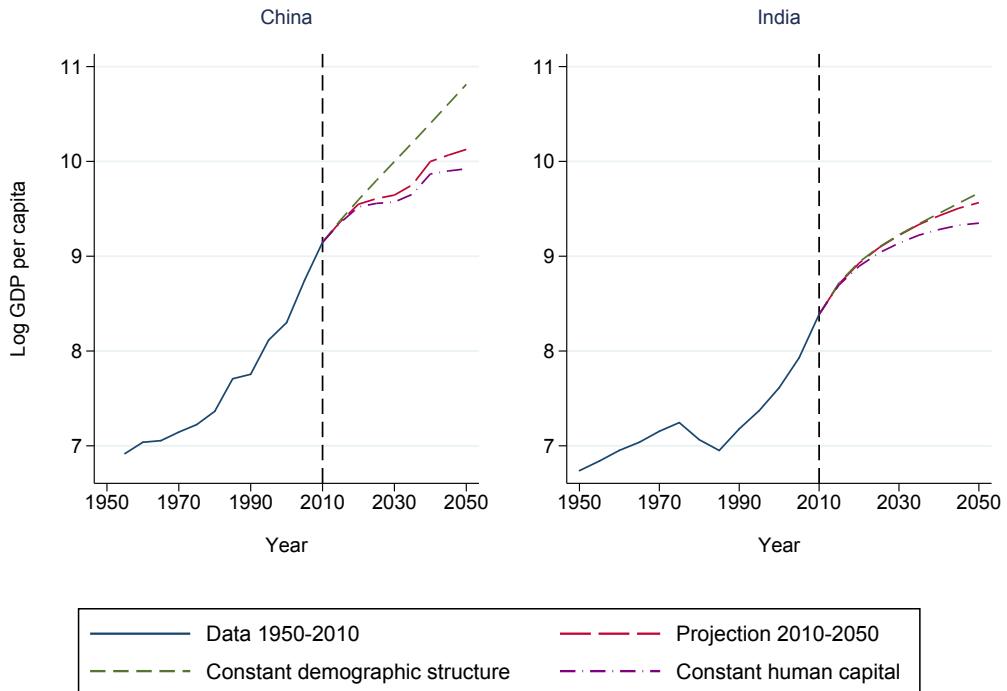


(b) Selected Regions: OECD and Non-OECD Countries

Figure A14: Projections for Income Per Capita

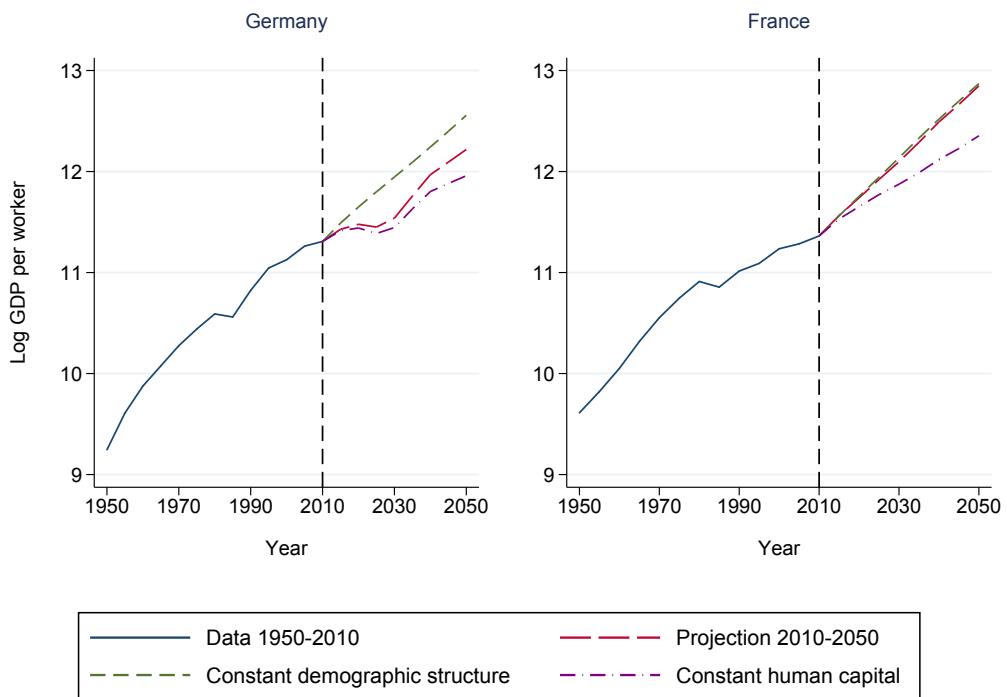


(a) Selected Countries: USA and Japan

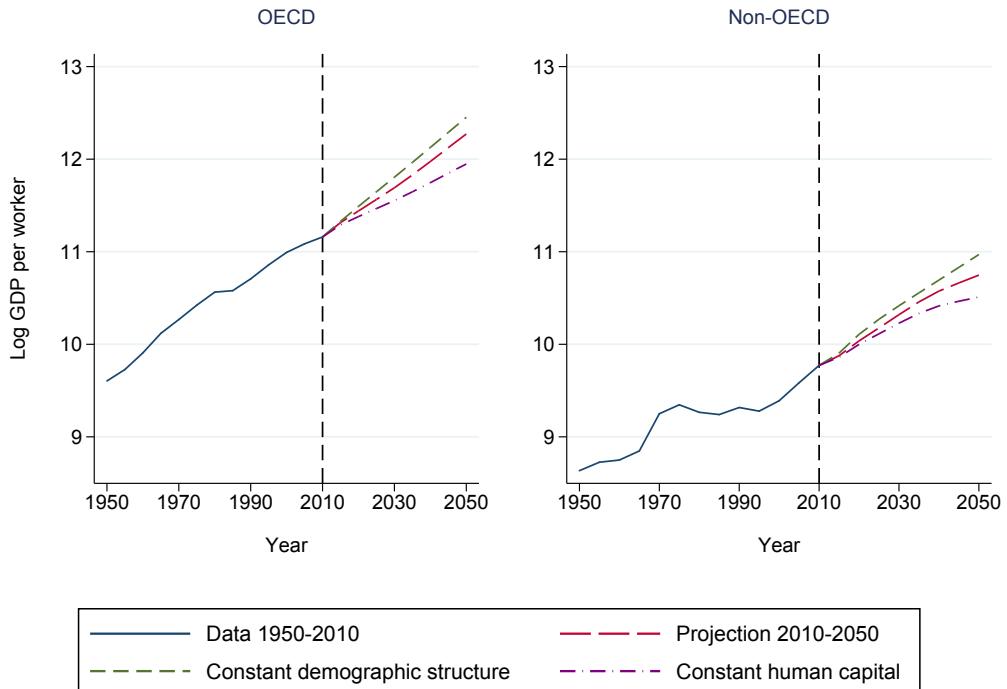


(b) Selected Countries: China and India

Figure A15: Projections for Income Per Capita

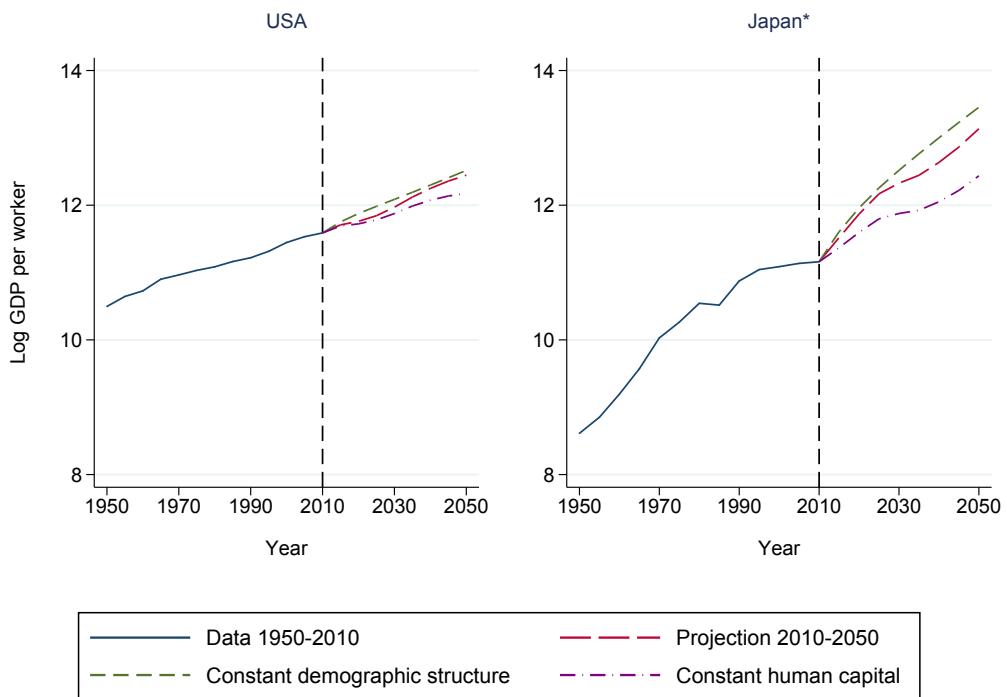


(a) Selected Countries: Germany and France

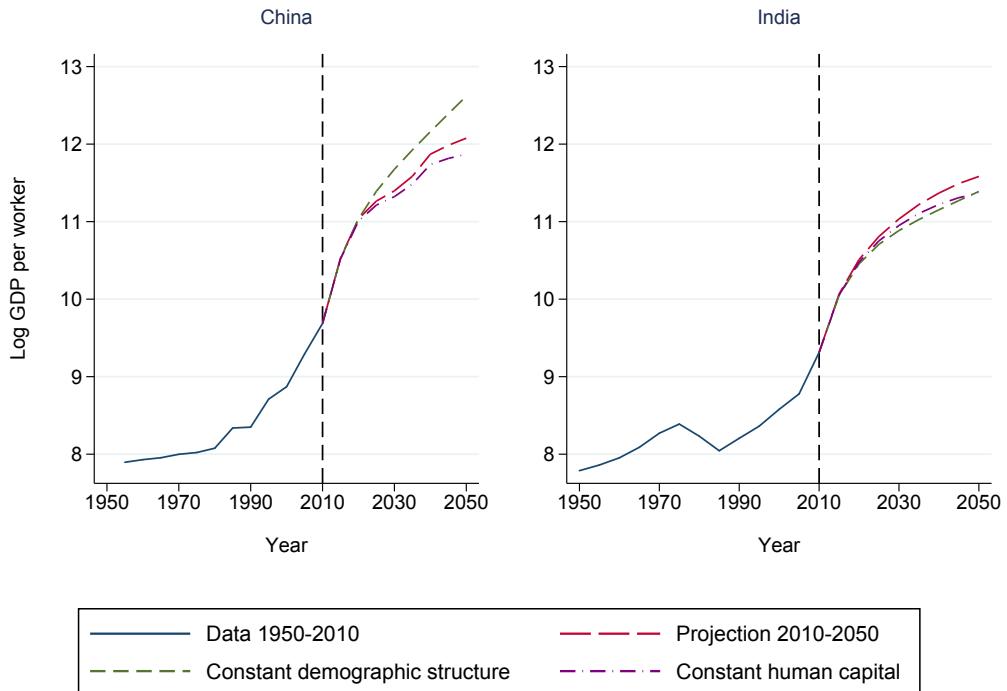


(b) Selected Regions: OECD and Non-OECD Countries

Figure A16: Projections when Controlling for the Size of the Working-Age Population

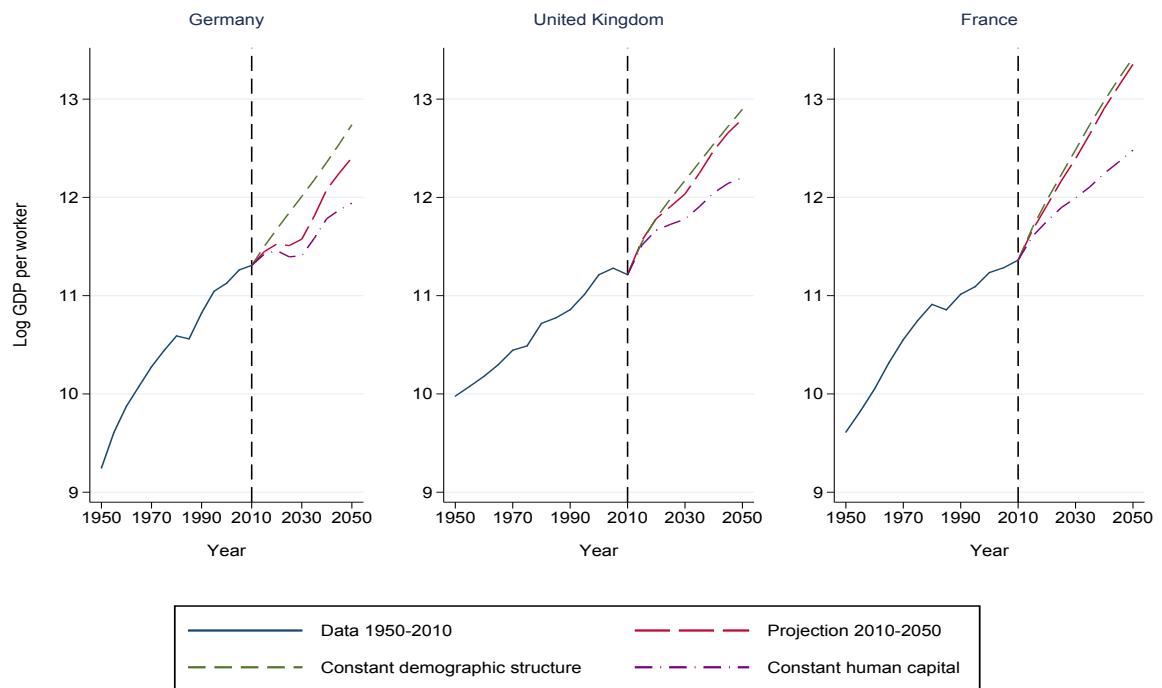


(a) Selected Countries: USA and Japan

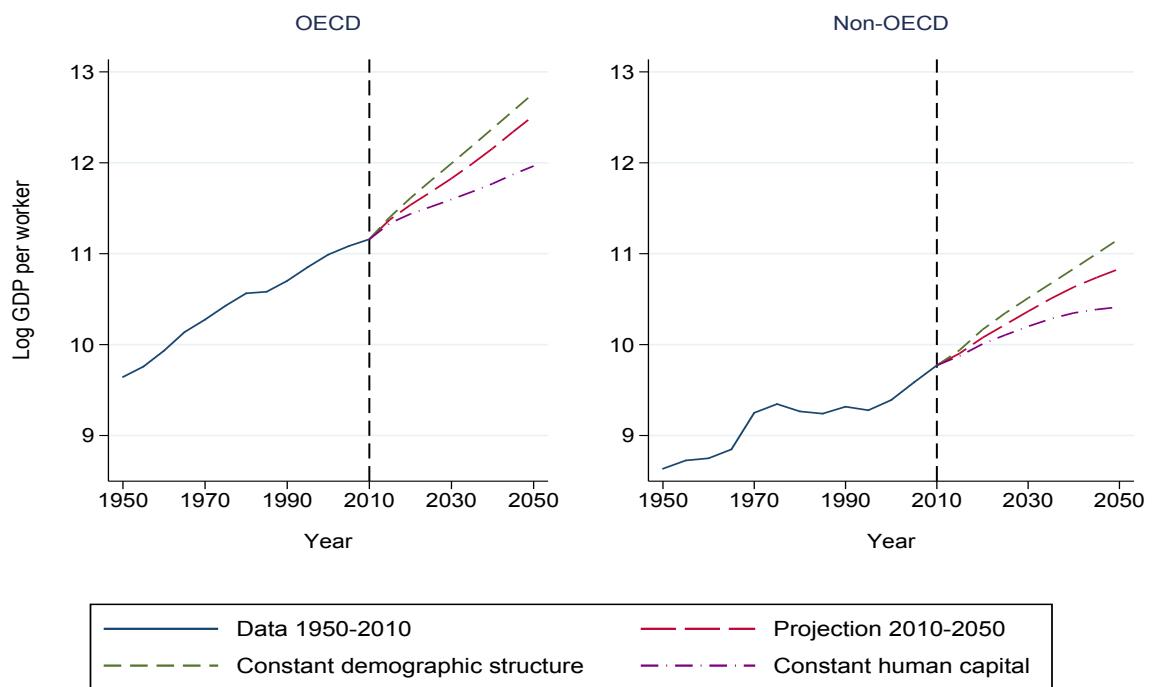


(b) Selected Countries: China and India

Figure A17: Projections when Controlling for the Size of the Working-Age Population

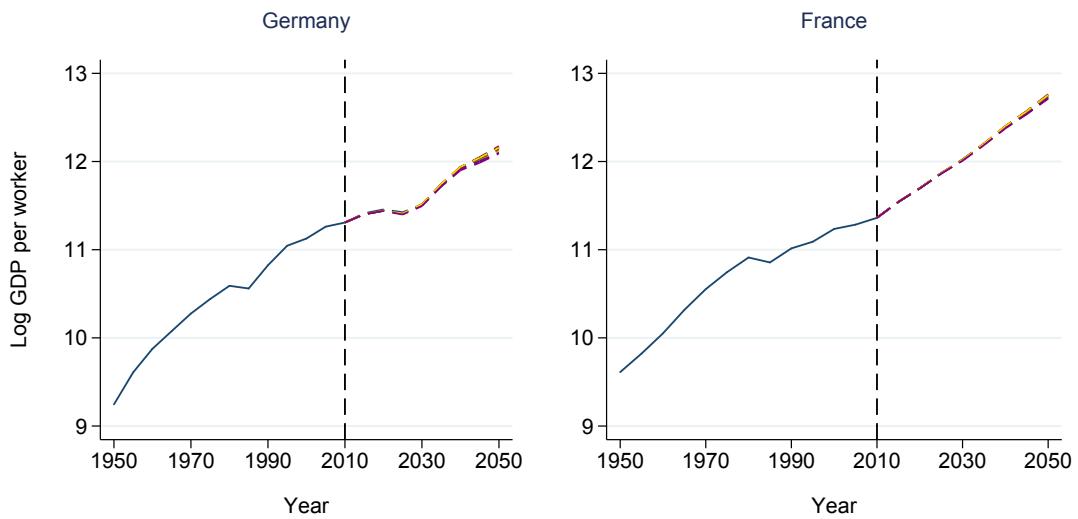


(a) Selected Countries: Germany and France

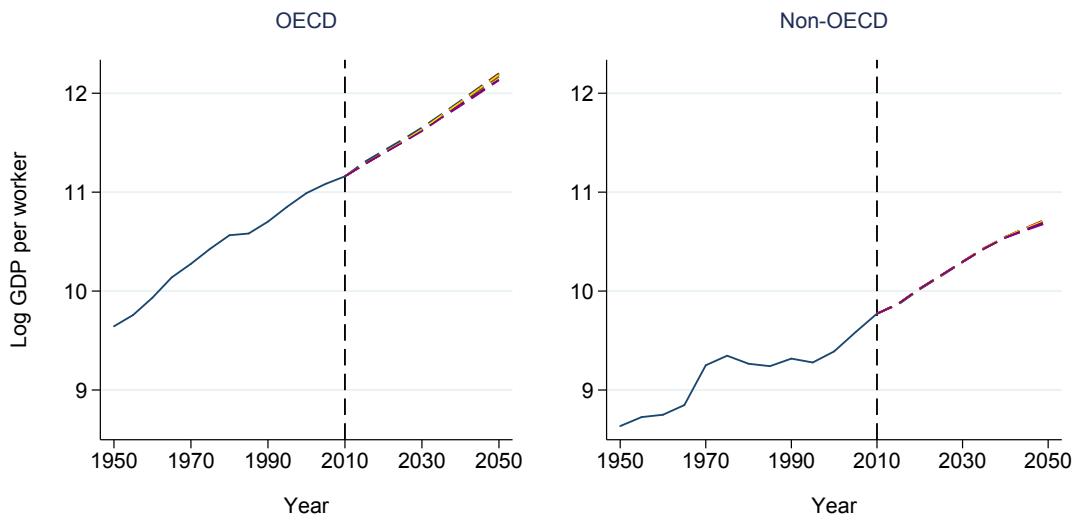


(b) Developed vs. Developing Economies

Figure A18: Projections for Instrumental Variables Model

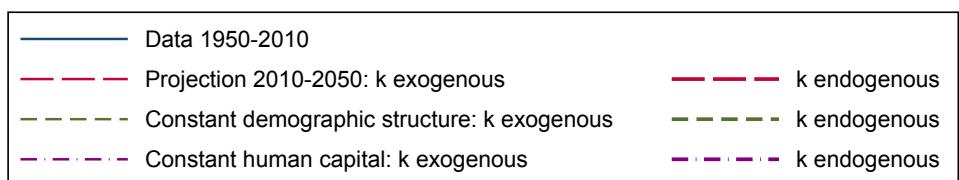
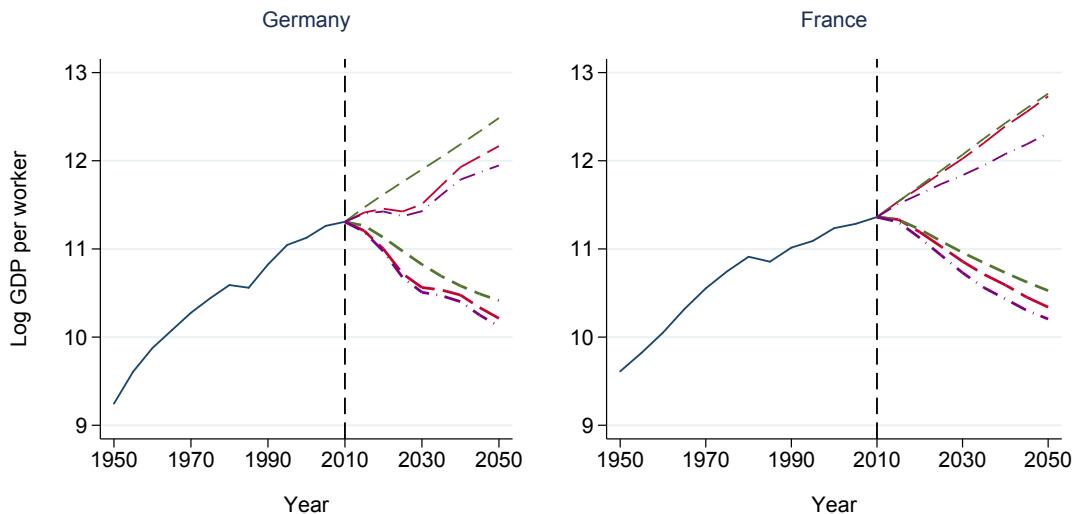


(a) Germany vs. France

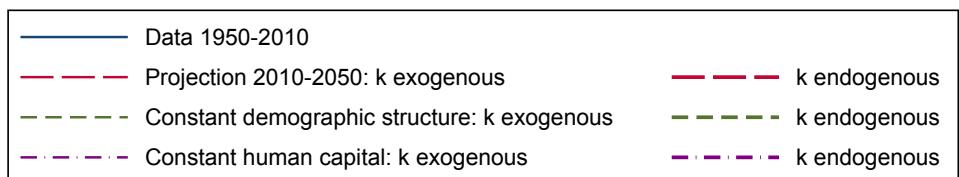
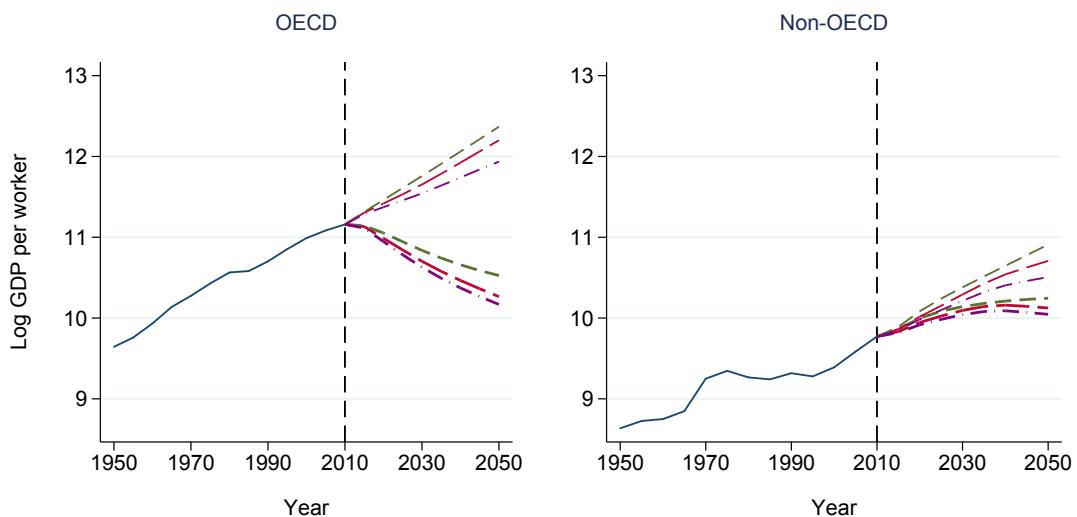


(b) OECD vs Non-OECD Countries

Figure A19: Projections with Alternative Assumptions About Fertility, Mortality, and Migration

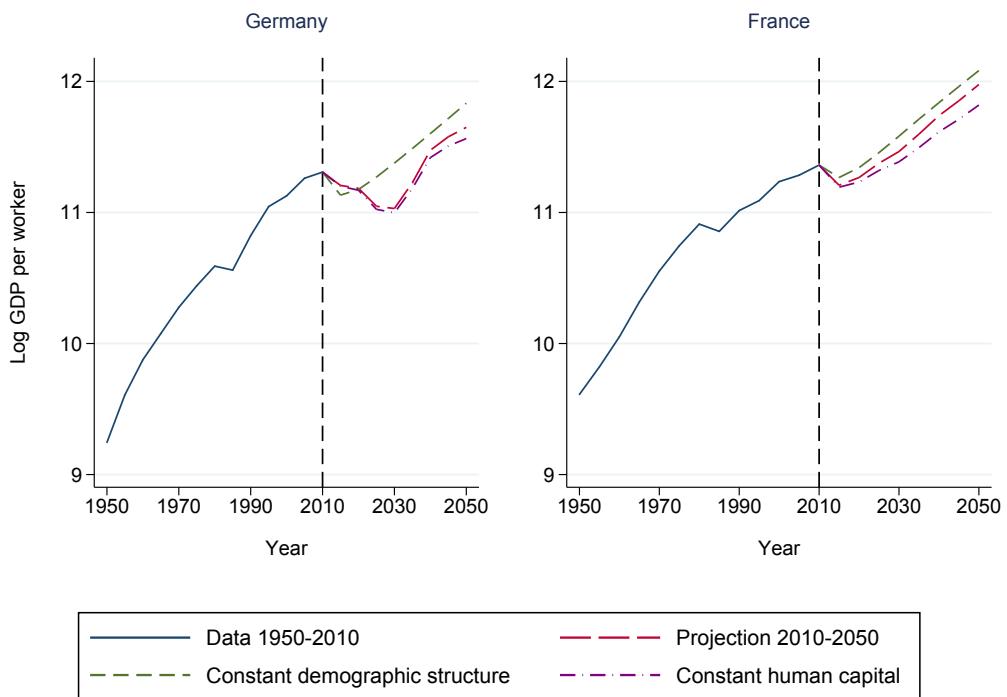


(a) Germany vs. France

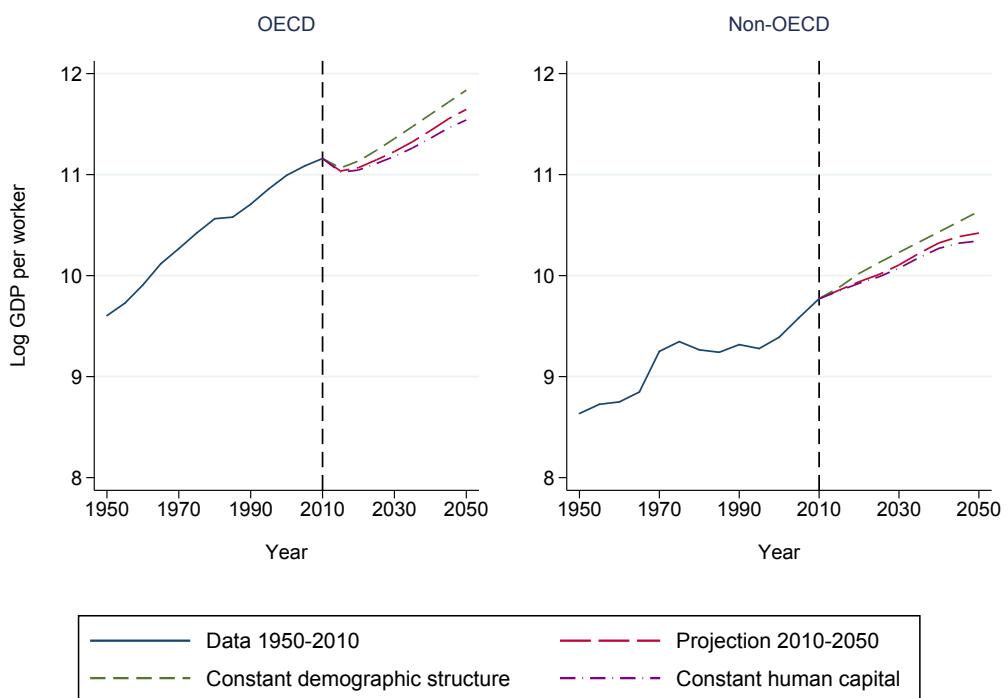


(b) OECD vs Non-OECD Countries

Figure A20: Projections with Endogenous Capital

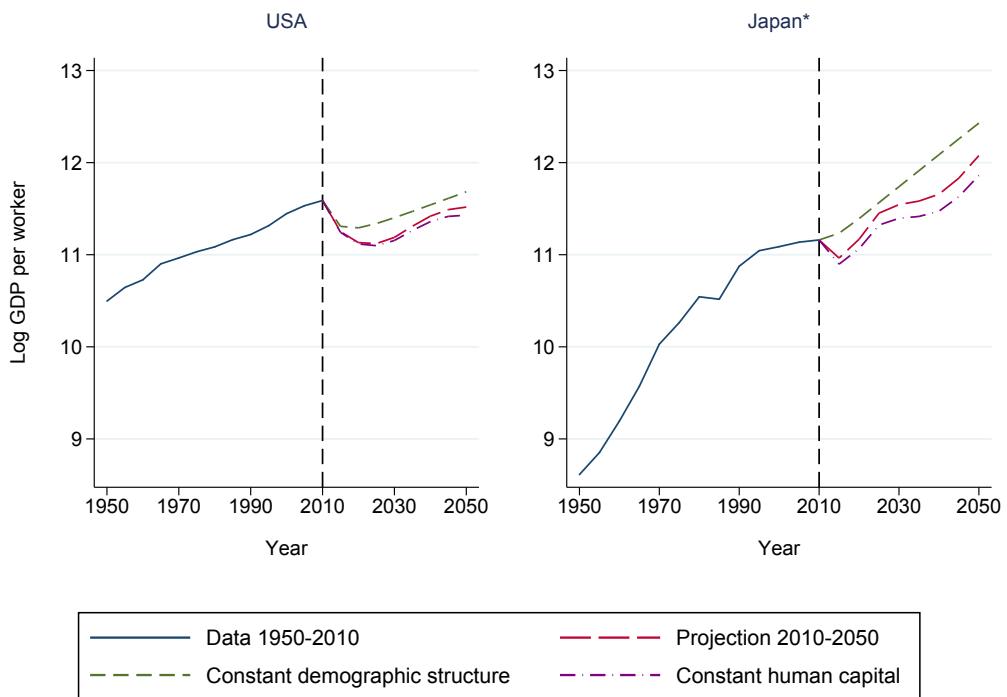


(a) Selected Countries: Germany and France

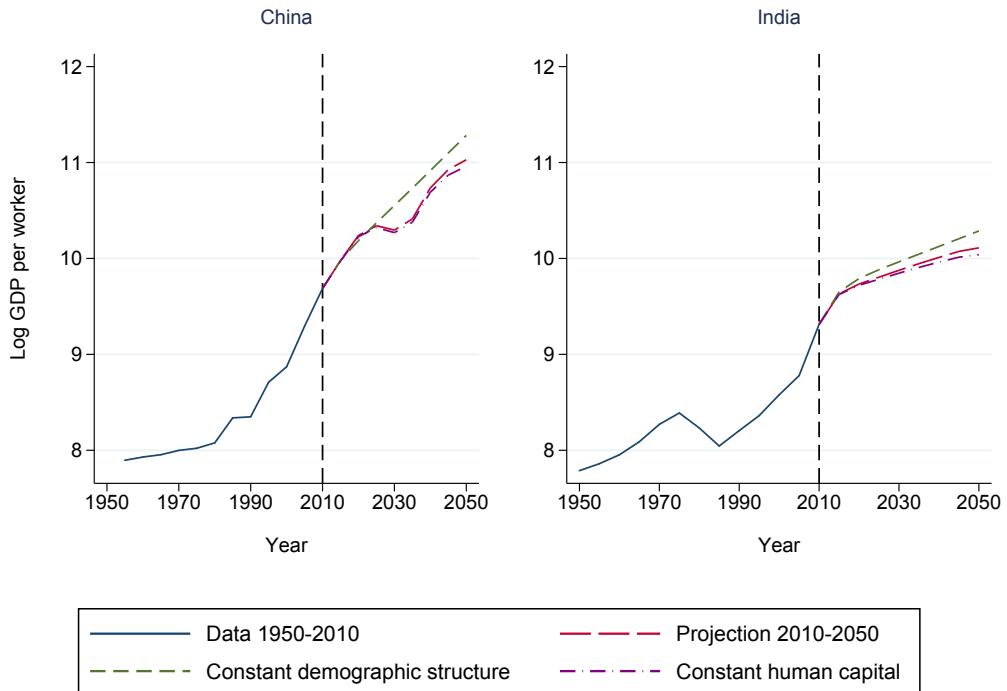


(b) Selected Regions: OECD and Non-OECD Countries

Figure A21: Projections for 1990–2010 Sample

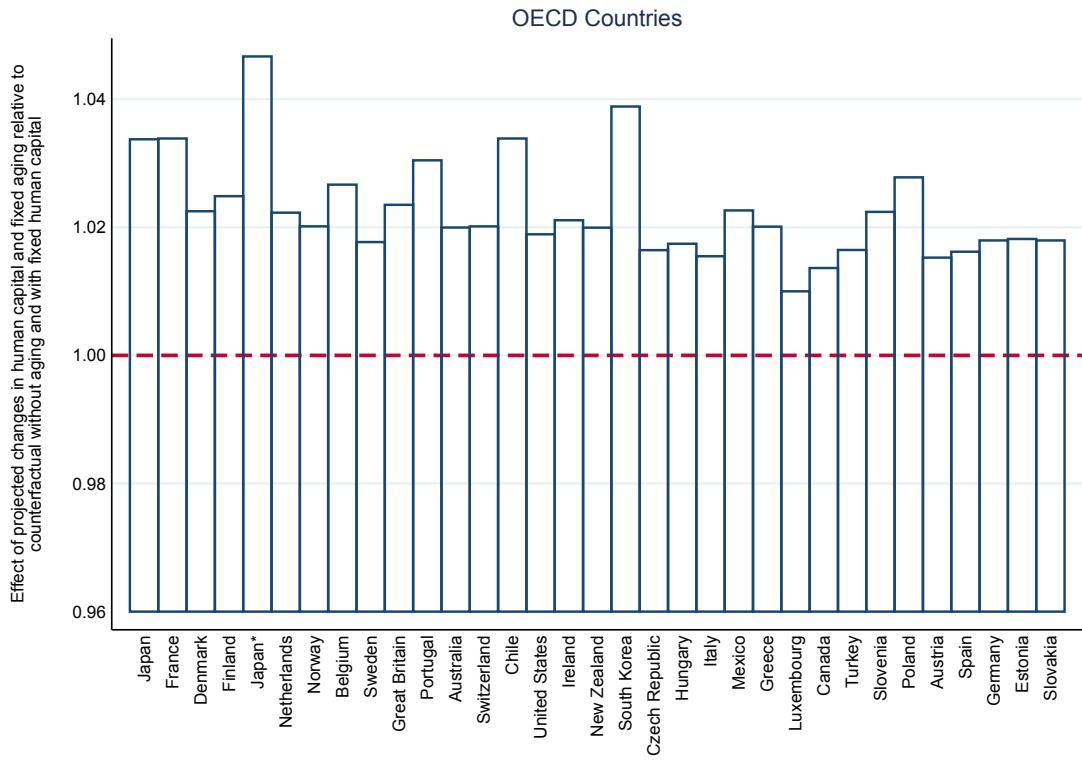


(a) Selected Countries: USA and Japan

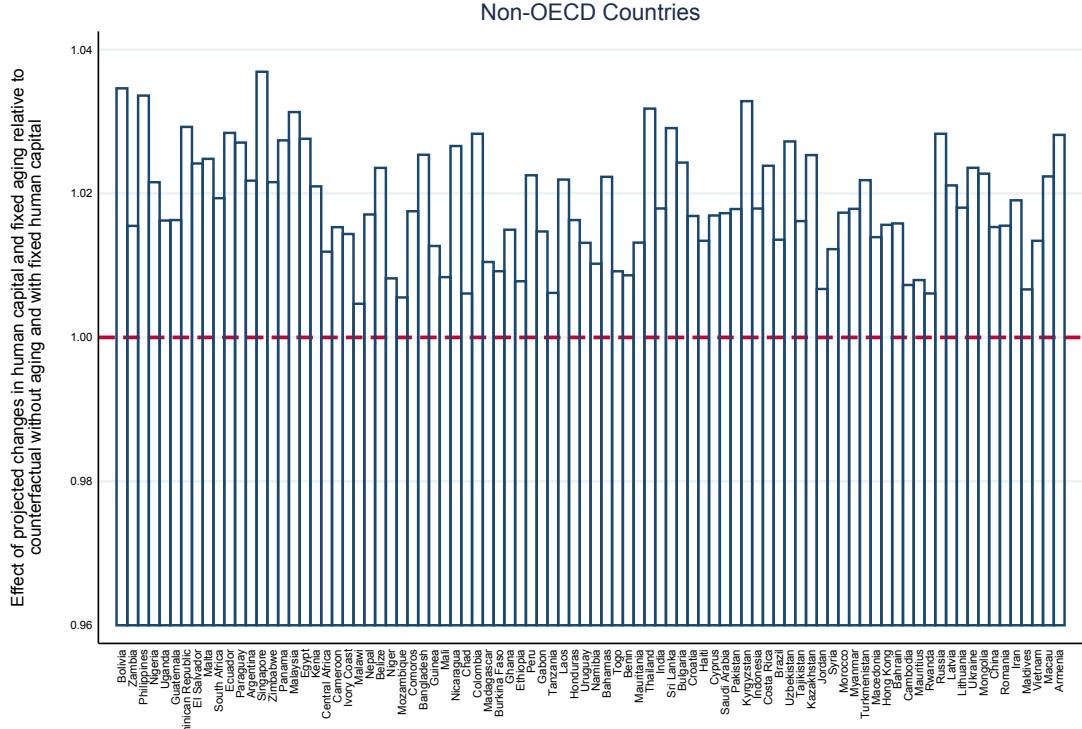


(b) Selected Countries: China and India

Figure A22: Projections for 1990–2010 Sample

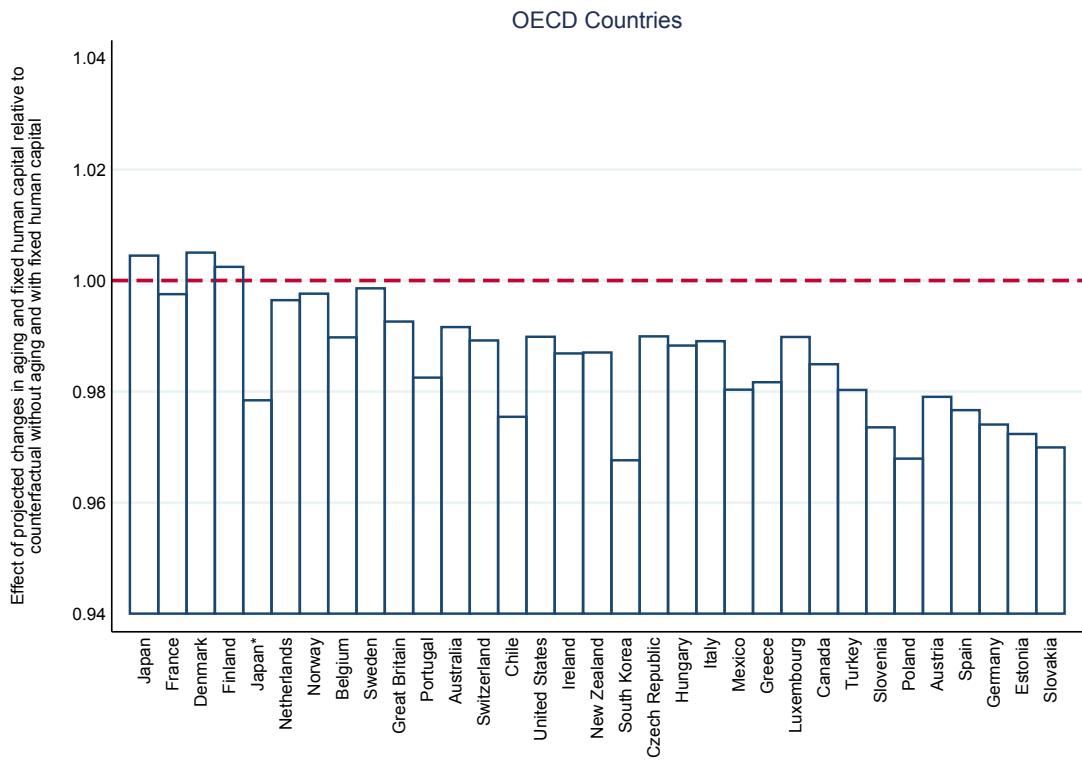


(a) OECD Countries

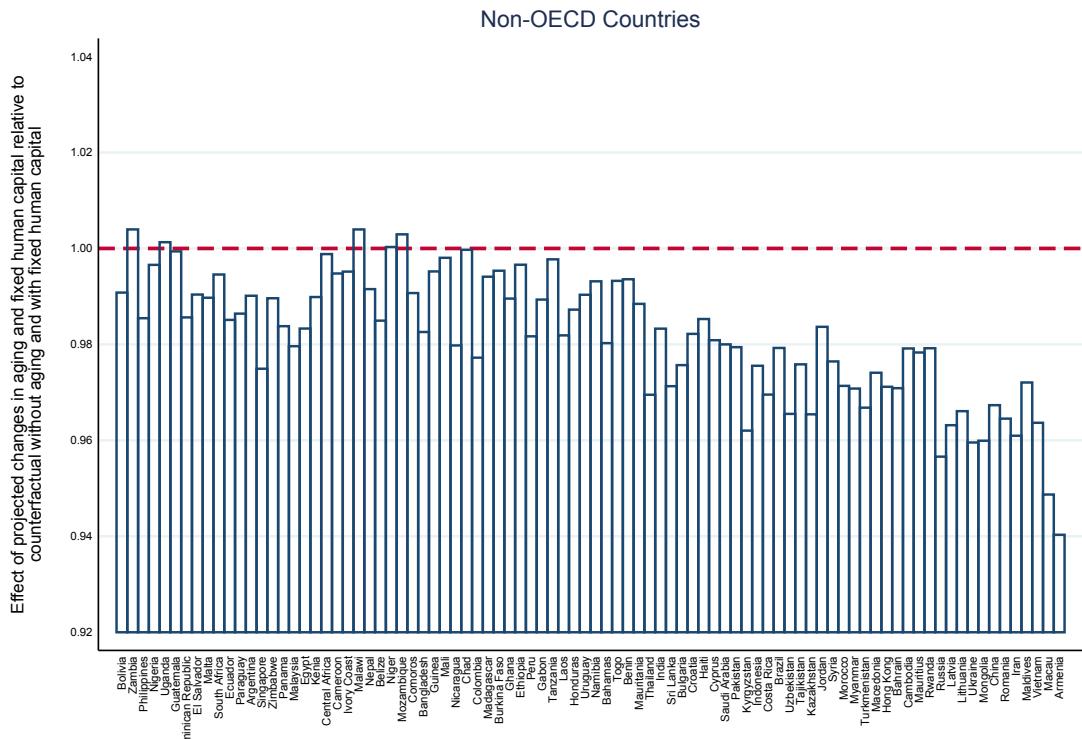


(b) Non-OECD Countries

Figure A23: Economic Performance for Constant Relative to Changing Demographic Structure

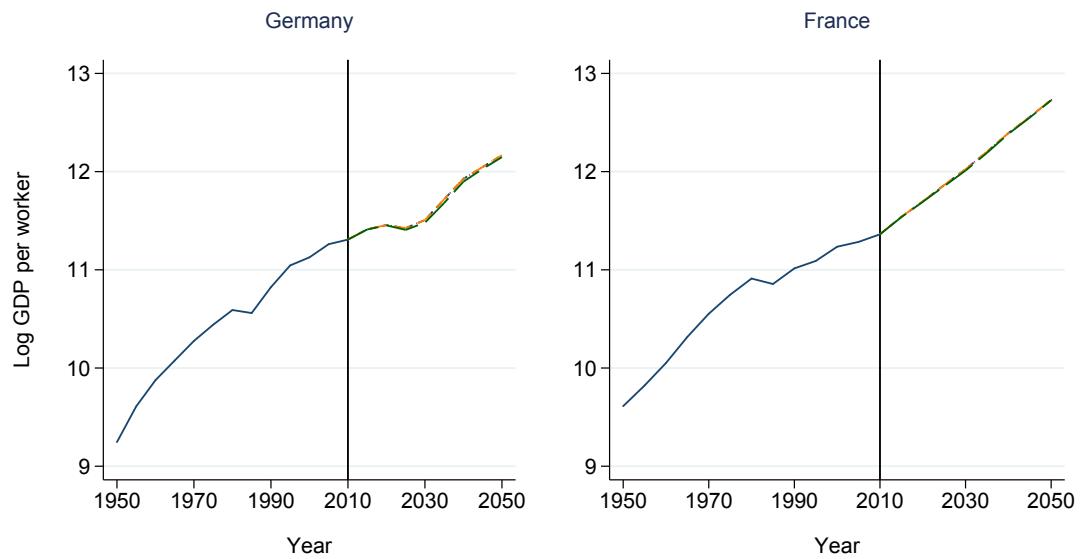


(a) OECD Countries



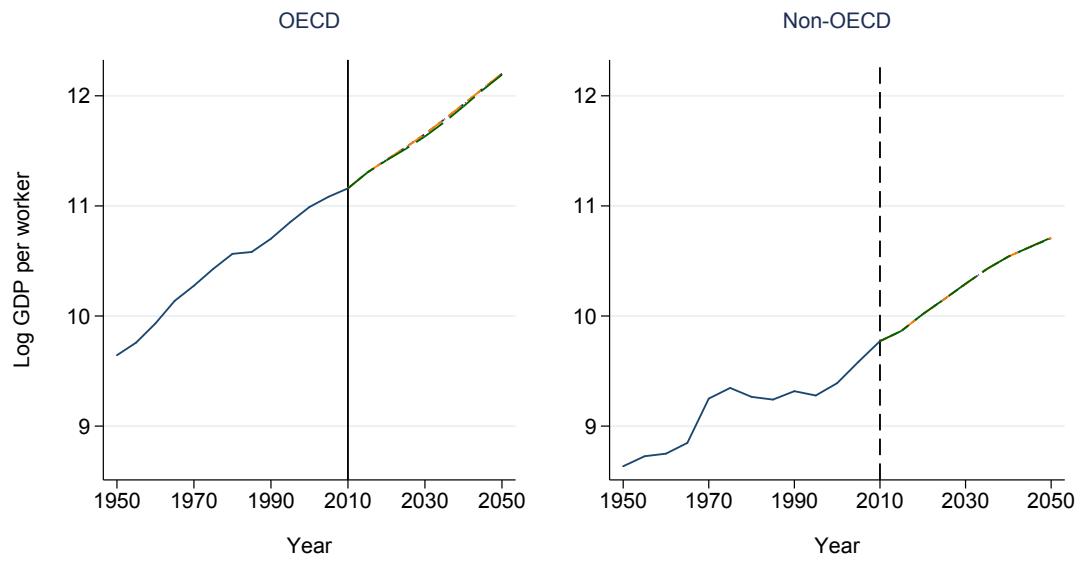
(b) Non-OECD Countries

Figure A24: Economic Performance for Constant Relative to Changing Human Capital



— Data 1950-2010	... Fast enrollment
- - General education trend	— Constant enrollment ratio
- - Constant enrollment number	

(a) Germany and France



— Data 1950-2010	... Fast enrollment
- - General education trend	— Constant enrollment ratio
- - Constant enrollment number	

(b) OECD and Non-OECD Countries

Figure A25: Alternative Education Scenarios

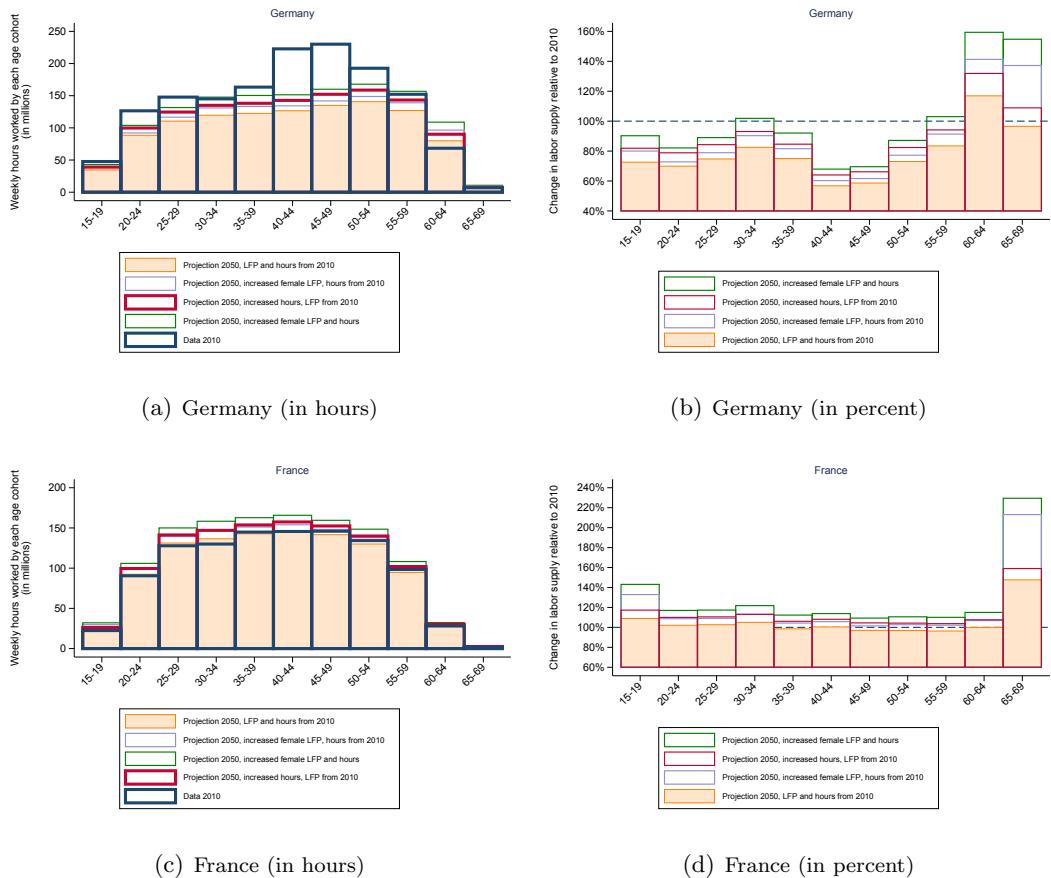


Figure A26: Projected Change in Cohort Labor Supply between 2010 and 2050

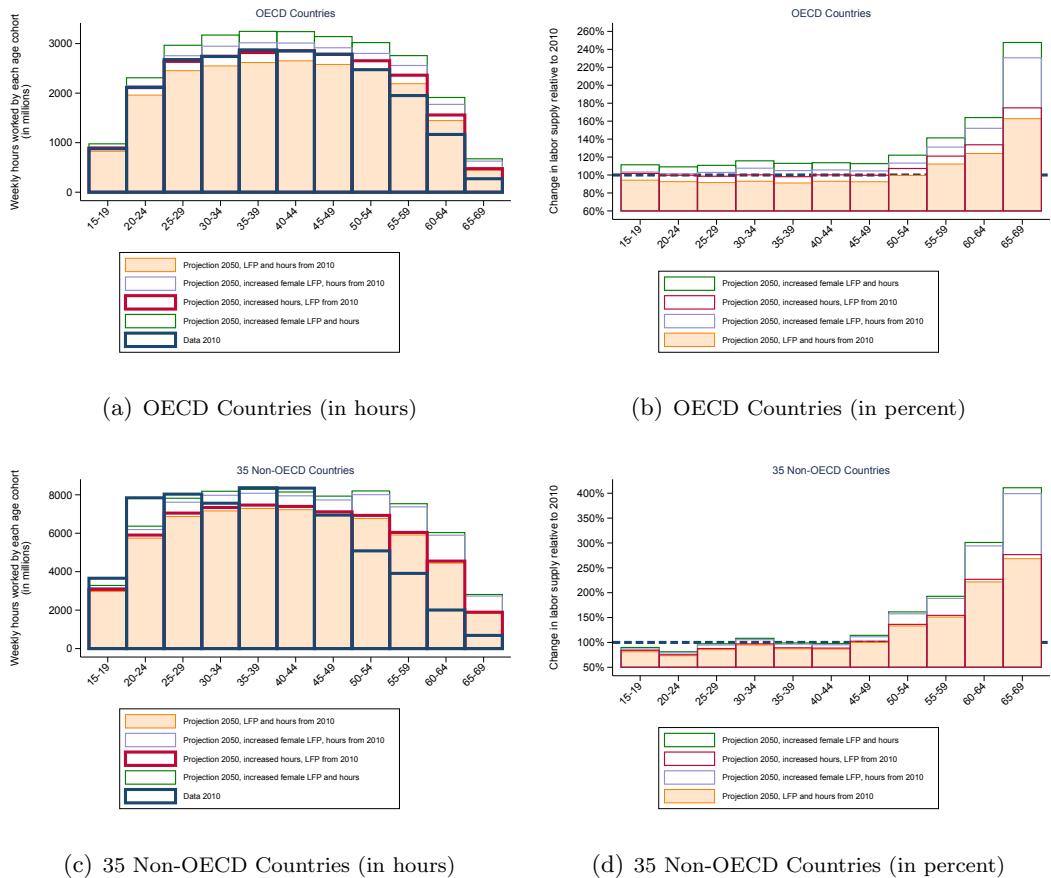
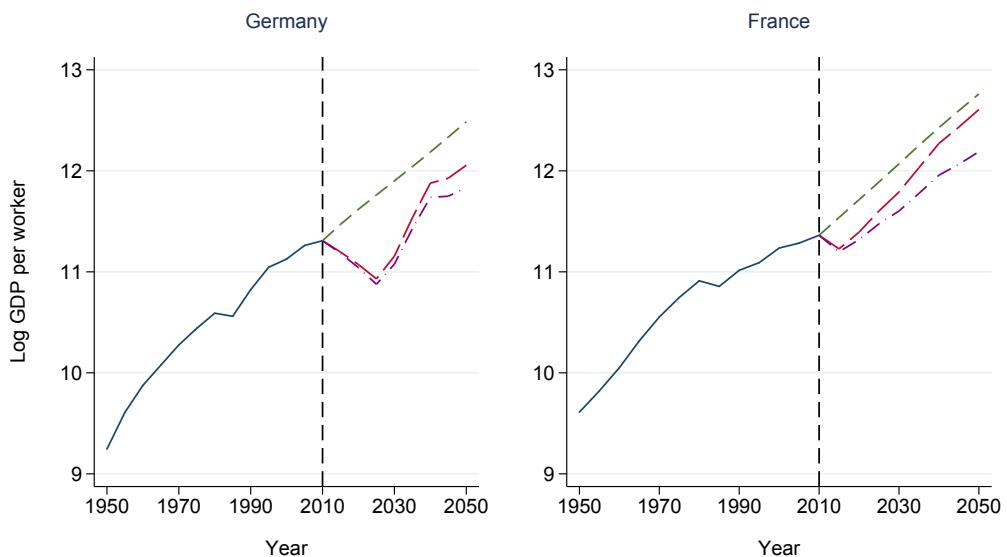
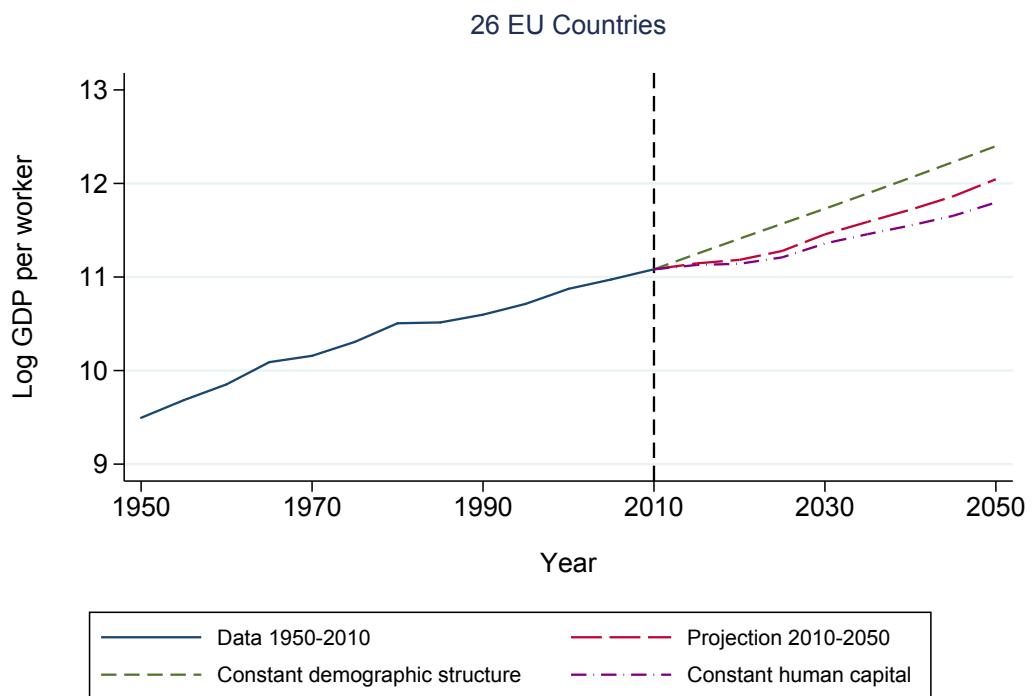


Figure A27: Projected Change in Cohort Labor Supply between 2010 and 2050

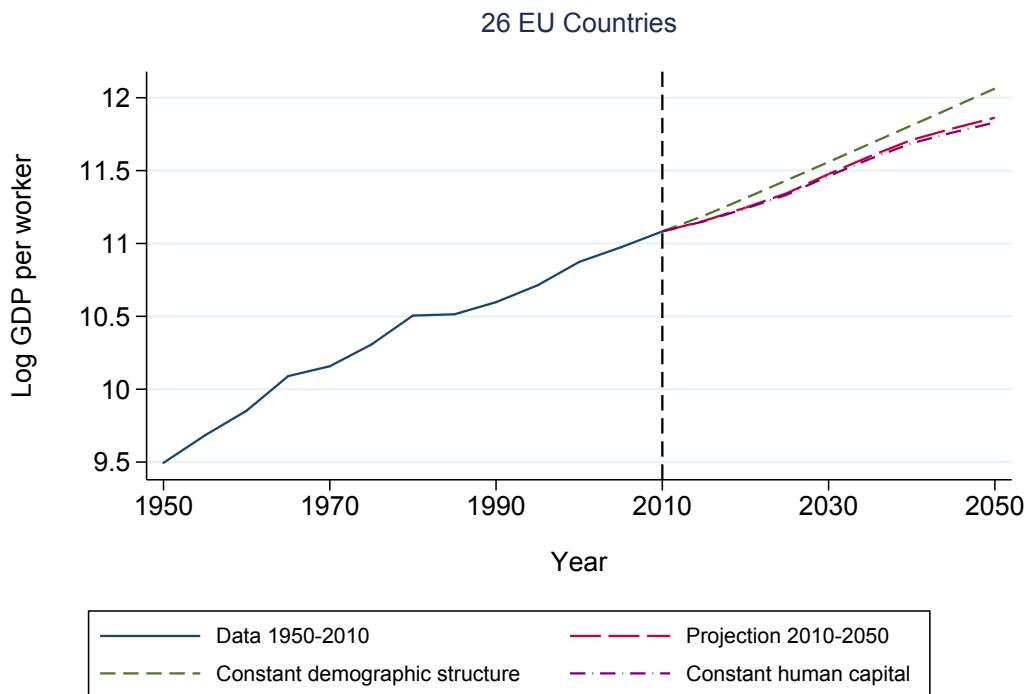


(a) Germany and France

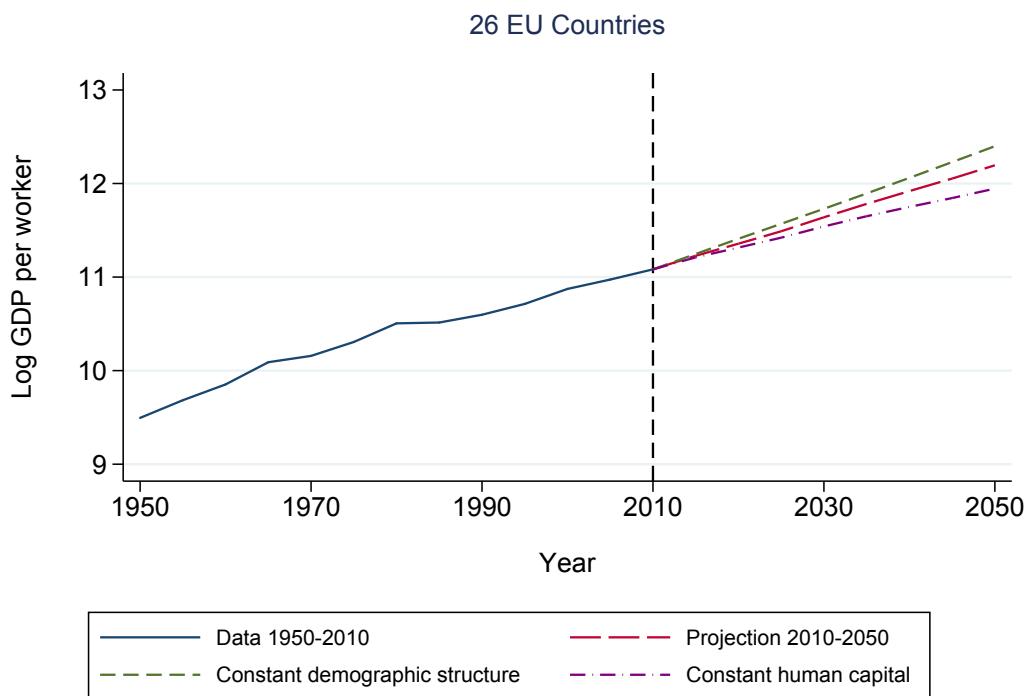


(b) 26 EU Countries

Figure A28: Reduced Form Projections: Changing Labor Force Participation based on Estimates from Working-Age Population



(a) Estimates based on Labor Force



(b) Estimates based on Working-Age Population (Baseline)

Figure A29: Projections: Labor Force Participation vs. Working-Age Population

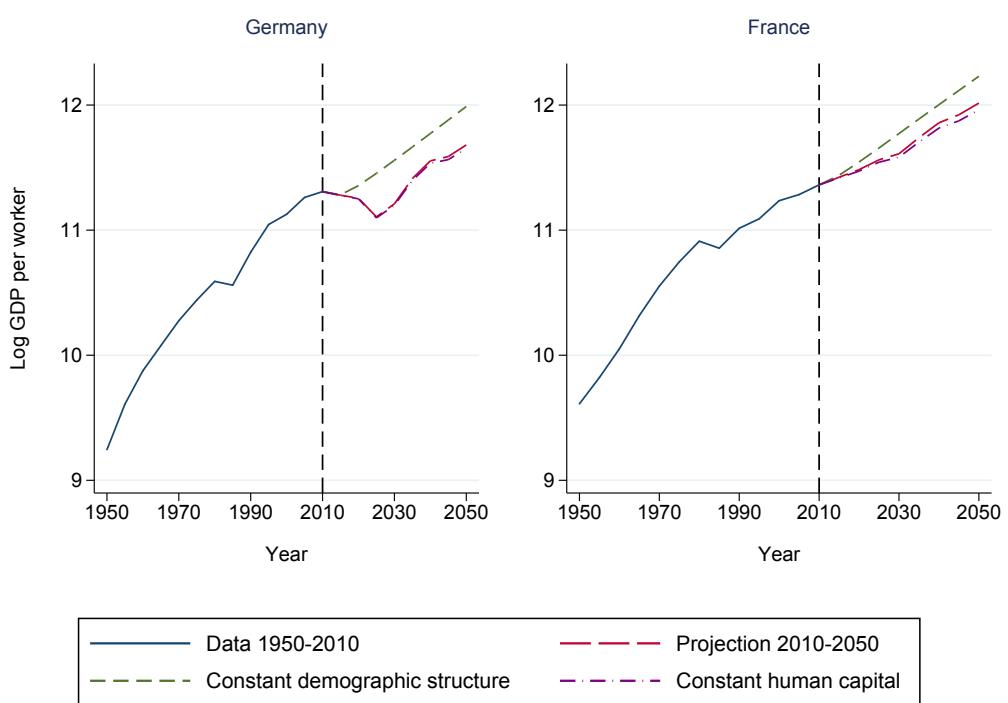
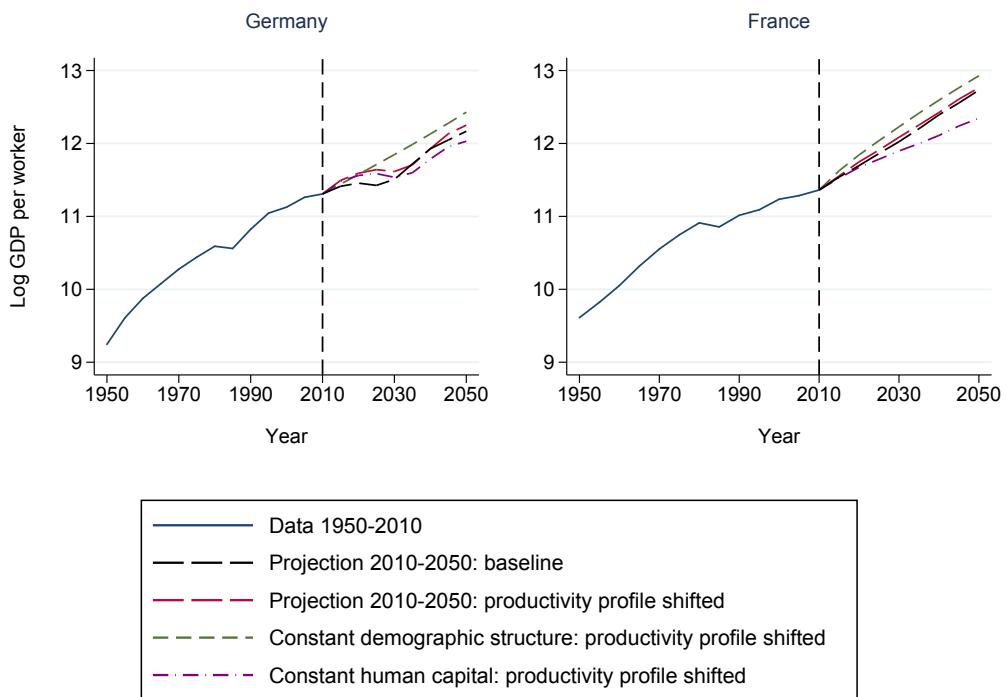
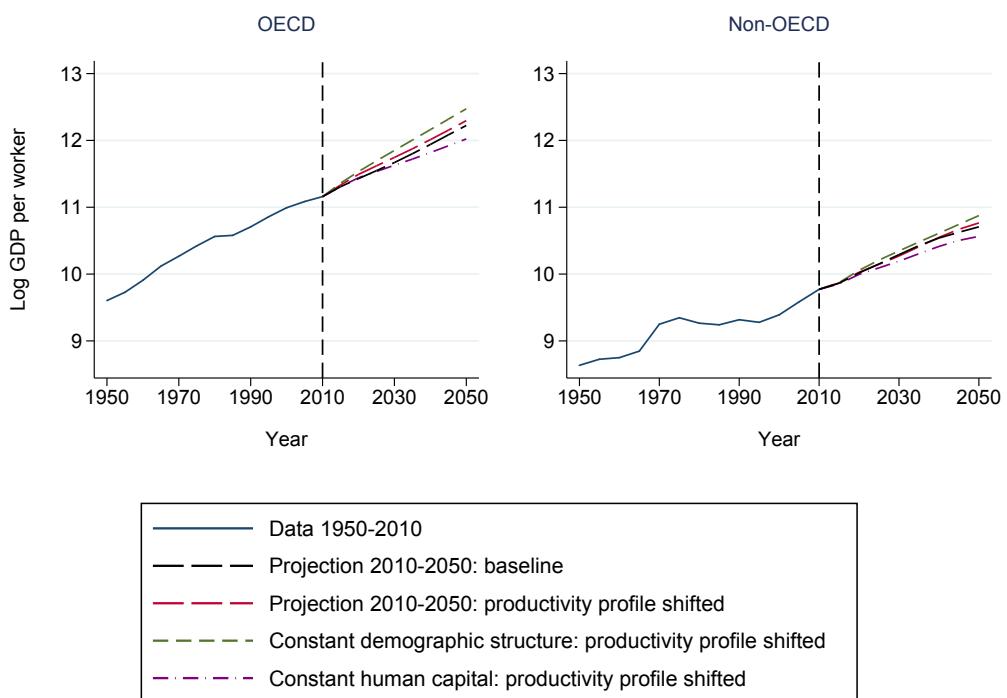


Figure A30: Projections for Changing Labor Force Participation (Germany and France)

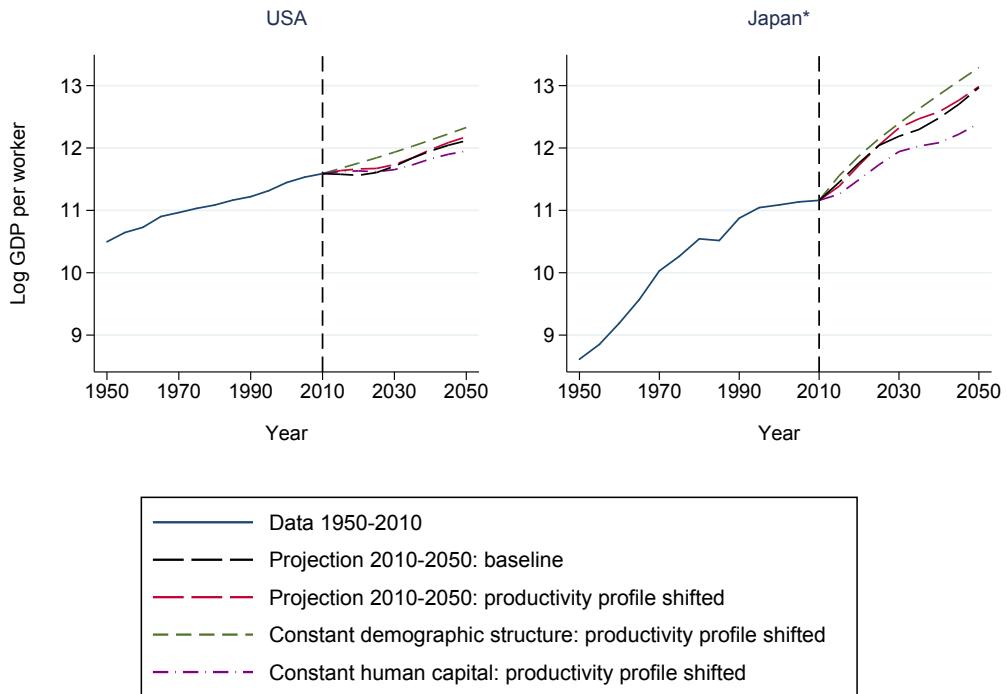


(a) Selected Countries: Germany and France

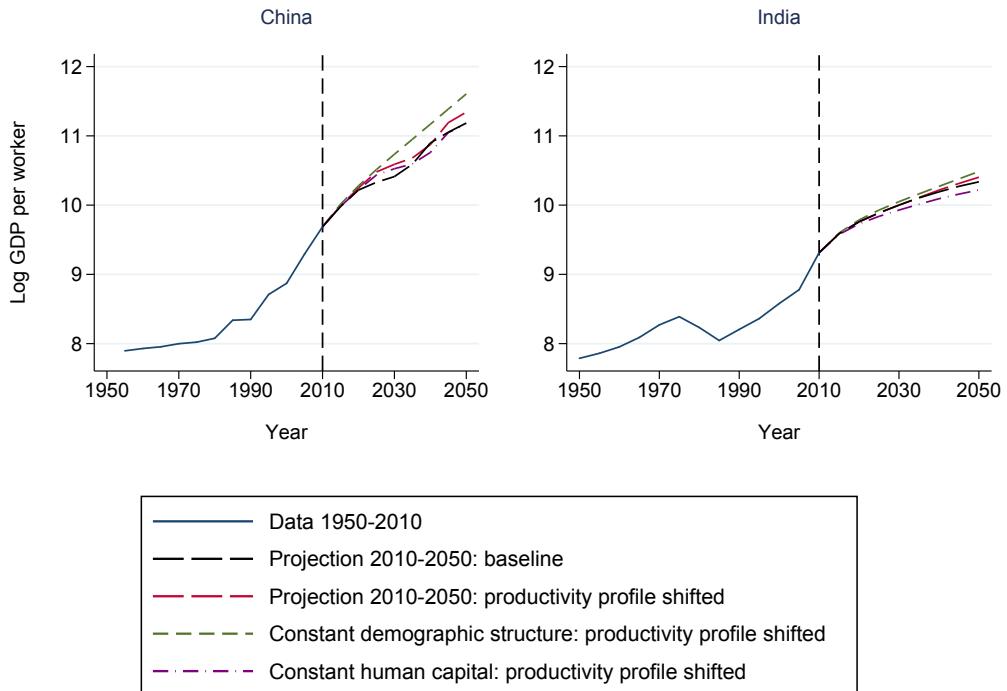


(b) Selected Regions: OECD and Non-OECD Countries

Figure A31: Projections for Shifted Productivity Profile



(a) Selected Countries: USA and Japan



(b) Selected Countries: China and India

Figure A32: Projections for Shifted Productivity Profile

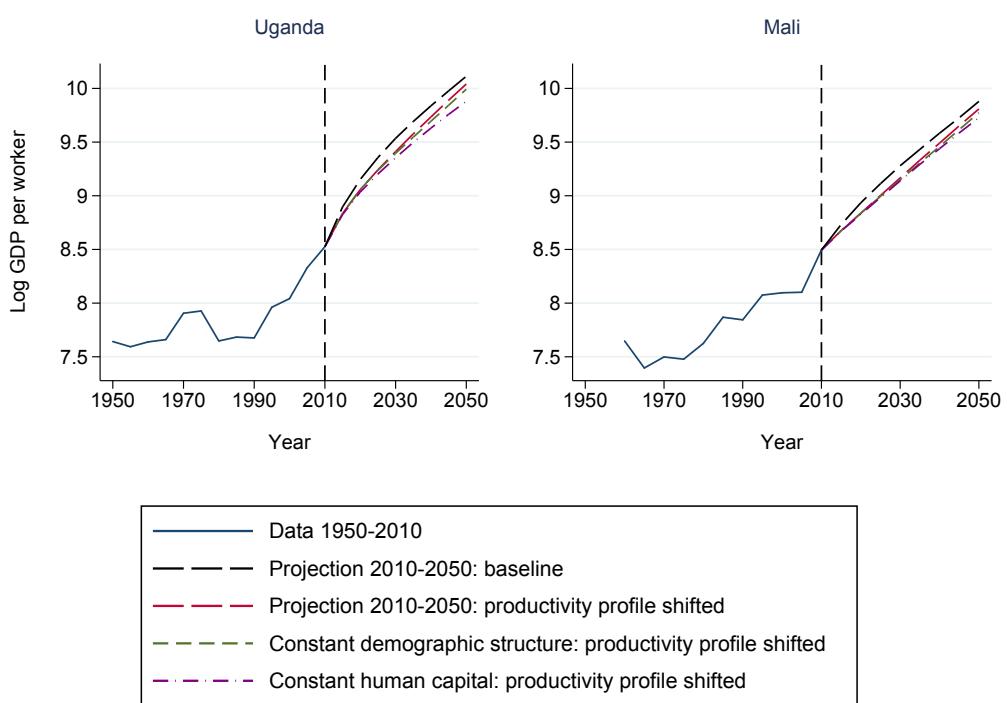
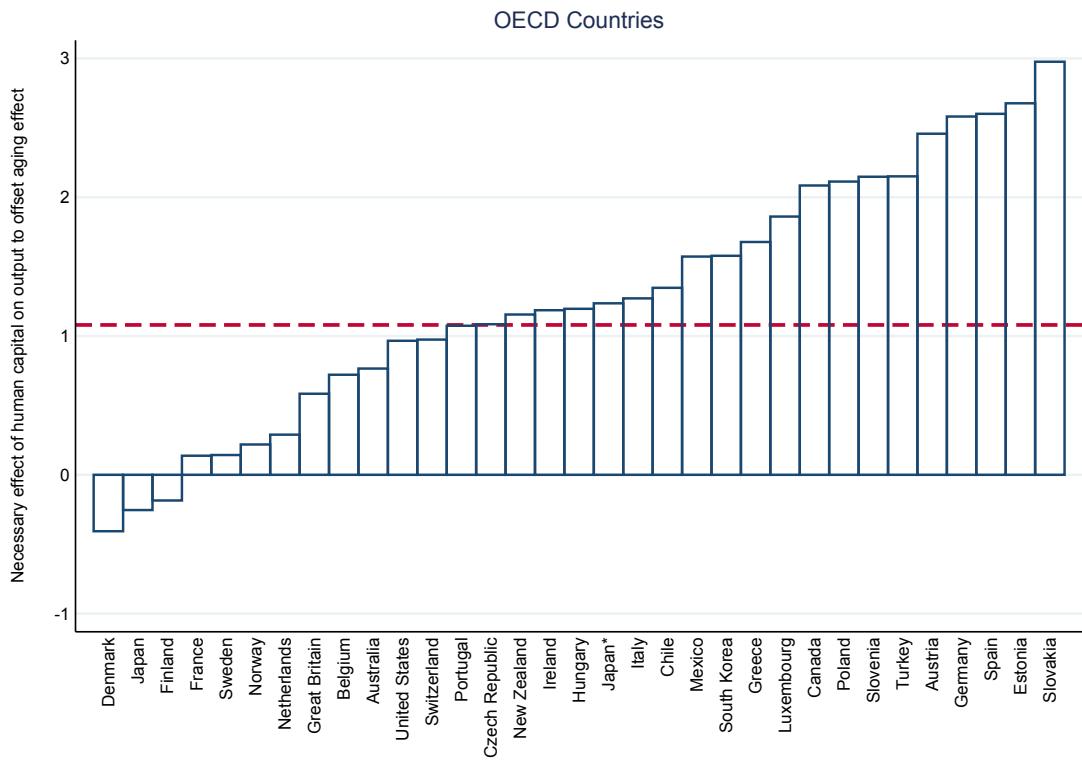
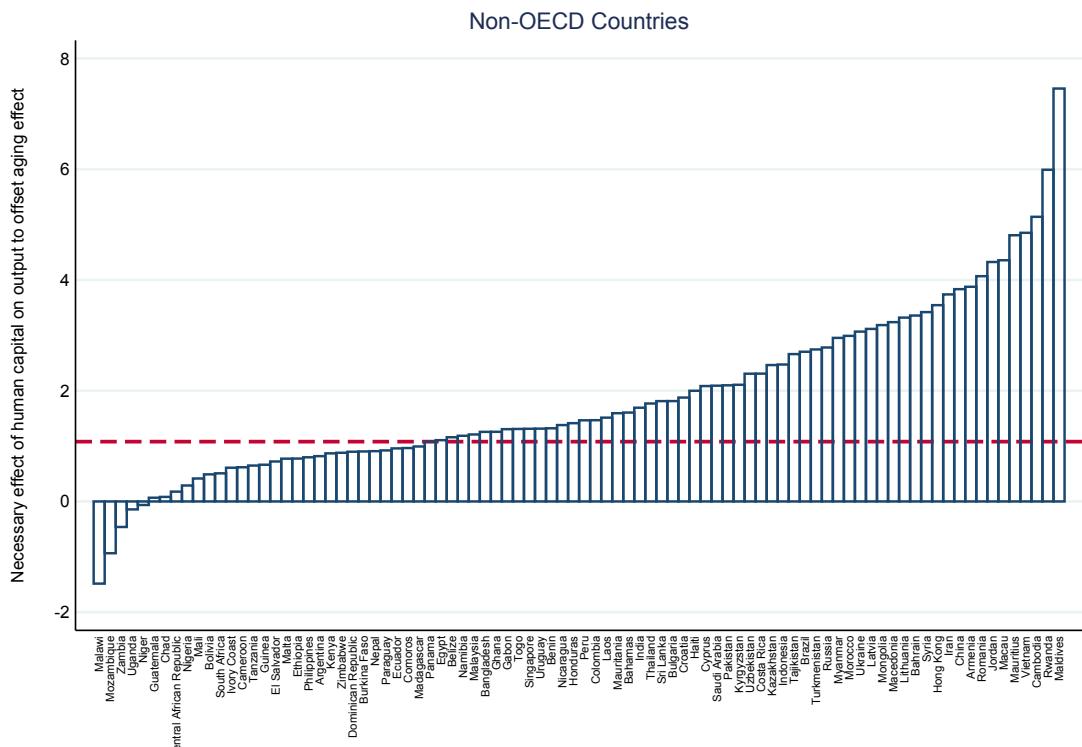


Figure A33: Projections for Shifted Productivity Profile



(a) OECD Countries



(b) Non-OECD Countries

Figure A34: How Large Must λ^h Be to Offset the Aging Effect?

Additional Tables

Table A1: Descriptives Statistics

	IIASA-VID sample (<i>n</i> = 120)					Barro-Lee sample (<i>n</i> = 139)				
	Mean	Std. Dev.	Min	Max	Obs.	Mean	Std. Dev.	Min	Max	Obs.
<i>GDP and physical capital</i>										
Log output p.w.	9.59	1.12	6.92	12.12	1098	9.72	1.12	6.18	13.07	1259
Growth of output p.w.	0.11	0.22	-1.56	1.24	1098	0.10	0.23	-1.19	1.24	1259
Log output p.c.	8.61	1.18	5.95	11.45	1098	8.71	1.19	5.05	12.43	1259
Growth of output p.c.	0.12	0.23	-1.57	1.24	1098	0.11	0.23	-1.28	1.20	1259
Log capital p.w.	10.31	1.50	5.69	13.02	1098	10.45	1.45	5.69	13.87	1259
Growth of capital p.w.	0.17	0.25	-2.05	2.12	1098	0.17	0.25	-1.31	2.16	1259
<i>Share of age cohort in working-age population</i>										
Total (in millions)	28.34	90.41	0.08	1013.06	1098	25.01	85.21	0.09	1018.27	1259
Change (in millions)	2.77	9.04	-4.18	93.45	1098	2.16	7.81	-4.13	96.55	1259
Share < 20	0.16	0.04	0.07	0.25	1098	0.16	0.04	0.06	0.25	1259
Share 20–24	0.14	0.03	0.07	0.21	1098	0.14	0.03	0.07	0.24	1259
Share 25–29	0.13	0.02	0.08	0.19	1098	0.13	0.02	0.08	0.25	1259
Share 30–34	0.11	0.01	0.07	0.19	1098	0.11	0.02	0.07	0.20	1259
Share 35–39	0.10	0.01	0.07	0.15	1098	0.10	0.01	0.05	0.18	1259
Share 40–44	0.09	0.01	0.05	0.15	1098	0.09	0.01	0.04	0.15	1259
Share 45–49	0.08	0.02	0.05	0.13	1098	0.08	0.02	0.04	0.13	1259
Share 50–54	0.07	0.02	0.03	0.12	1098	0.07	0.02	0.03	0.12	1259
Share 55–59	0.06	0.02	0.02	0.11	1098	0.06	0.02	0.01	0.11	1259
Share 60–64	0.05	0.02	0.01	0.11	1098	0.05	0.02	0.01	0.11	1259
Share 65+	0.04	0.02	0.01	0.09	1098	0.04	0.02	0.01	0.09	1259
<i>Share high-skill in working-age population</i>										
Share high-skill	0.08	0.07	0.00	0.37	1098	0.08	0.09	0.00	0.58	1259
Change in share high-skill	0.01	0.01	-0.02	0.06	1098	0.01	0.02	-0.08	0.15	1259
Share < 20	0.01	0.03	0.00	0.25	1098	0.03	0.05	0.00	0.46	1259
Share 20–24	0.07	0.08	0.00	0.54	1098	0.12	0.13	0.00	0.93	1259
Share 25–29	0.12	0.10	0.00	0.56	1098	0.11	0.12	0.00	0.83	1259
Share 30–34	0.12	0.10	0.00	0.53	1098	0.10	0.11	0.00	0.66	1259
Share 35–39	0.11	0.09	0.00	0.50	1098	0.10	0.11	0.00	0.62	1259
Share 40–44	0.10	0.09	0.00	0.46	1098	0.09	0.10	0.00	0.62	1259
Share 45–49	0.08	0.08	0.00	0.44	1098	0.08	0.10	0.00	0.62	1259
Share 50–54	0.07	0.08	0.00	0.42	1098	0.07	0.09	0.00	0.60	1259
Share 55–59	0.06	0.07	0.00	0.39	1098	0.06	0.08	0.00	0.58	1259
Share 60–64	0.05	0.06	0.00	0.37	1098	0.05	0.07	0.00	0.57	1259
Share 65+	0.04	0.05	0.00	0.32	1098	0.04	0.06	0.00	0.54	1259
<i>Dependency ratio and life expectancy</i>										
Dependency ratio	0.64	0.21	0.21	1.07	1086	0.64	0.21	0.16	1.09	1248
Life expectancy	64.79	11.20	23.73	82.98	1053	65.25	10.86	23.73	82.98	1198
<i>Share of age cohort in total labor force</i>										
Total (in millions)	22.45	78.59	0.06	801.59	582	19.36	73.45	0.06	801.59	672
Change (in millions)	1.66	5.31	-6.22	58.49	479	1.44	4.96	-6.22	58.49	551
Share < 20	0.08	0.05	0.01	0.20	645	0.08	0.05	0.01	0.19	742
Share 20–24	0.13	0.03	0.05	0.22	645	0.13	0.03	0.05	0.22	742
Share 25–29	0.14	0.02	0.08	0.22	645	0.15	0.02	0.07	0.23	742
Share 30–34	0.13	0.02	0.09	0.23	645	0.14	0.02	0.09	0.23	742
Share 35–39	0.12	0.02	0.07	0.20	645	0.12	0.02	0.07	0.20	742
Share 40–44	0.11	0.02	0.05	0.17	645	0.11	0.02	0.05	0.17	742
Share 45–49	0.09	0.02	0.04	0.16	645	0.09	0.02	0.04	0.17	742
Share 50–54	0.07	0.02	0.03	0.14	645	0.07	0.02	0.03	0.14	742
Share 55–59	0.05	0.02	0.02	0.12	645	0.05	0.02	0.02	0.12	742
Share 60–64	0.03	0.01	0.00	0.09	645	0.03	0.01	0.00	0.09	742
Share 65+	0.03	0.02	0.00	0.10	645	0.03	0.02	0.00	0.10	742

Table A2: Robustness: Differenced and Lagged Share of High Skills

	Demography	Skills	Demography	Bias	Demography	Skills	Both
	(1)	(2)	& Skills	Correction	Instrumented	Instrumented	Instrumented
	(3)	(4)	(5)	(6)	(7)		
(a) IIASA-VID sample							
Share < 20	-3.84*** (1.22)	-2.97** (1.21)	-2.96** (1.31)	-3.54*** (1.21)	-2.01 (1.27)	-2.73** (1.26)	
Share 20–24	-2.37** (1.10)	-1.87* (1.10)	-1.86 (1.40)	-3.27** (1.36)	-0.96 (1.13)	-2.40* (1.39)	
Share 25–29	-3.56** (1.42)	-3.25** (1.39)	-3.28** (1.66)	-2.88** (1.47)	-2.22* (1.34)	-1.80 (1.41)	
Share 30–34	-3.06** (1.27)	-2.80** (1.25)	-2.79* (1.66)	-4.03*** (1.43)	-1.84 (1.22)	-3.35** (1.49)	
Share 35–39	-4.01*** (1.44)	-3.72** (1.43)	-3.64** (1.74)	-2.99* (1.57)	-3.84** (1.55)	-2.58 (1.68)	
Share 40–44	-1.53 (1.32)	-1.32 (1.30)	-1.34 (1.47)	-1.81 (1.42)	-0.79 (1.30)	-1.82 (1.44)	
Share 45–49	-3.19** (1.43)	-3.01** (1.40)	-3.24 (2.15)	-3.93** (1.55)	-2.81** (1.40)	-3.80** (1.53)	
Share 55–59	-4.66** (1.85)	-4.28** (1.81)	-4.68** (2.15)	-4.30** (1.83)	-3.94** (1.81)	-4.15** (1.83)	
Share 60–64	-5.48*** (1.37)	-5.45*** (1.35)	-5.90*** (1.70)	-6.01*** (1.51)	-5.64*** (1.30)	-6.46*** (1.48)	
Share 65+	-3.06* (1.58)	-3.28** (1.54)	-3.39** (1.64)	-4.26*** (1.60)	-3.31* (1.73)	-3.97** (1.75)	
△ Share high-skill	1.89* (1.07)	2.23* (1.16)	1.80 (1.26)	1.82* (1.10)	0.68 (2.31)	-0.12 (2.29)	
Share high-skill ($t-1$)	0.87** (0.35)	0.94** (0.43)	0.70* (0.39)	0.72 (0.45)	2.80*** (0.84)	2.65*** (0.86)	
Cohort shares (p -value)	0.01	0.01	0.00	0.01	0.00	0.00	
Skill shares (p -value)	0.01	0.02	0.02	0.06	0.00	0.01	
First stage F -statistic				13.5	37.1	8.7	
Hansen test (p -value)				—	0.39	0.50	
(b) Barro-Lee sample							
Share < 20	-3.64*** (1.17)	-3.18*** (1.20)	-2.88** (1.44)	-3.03* (1.55)	-3.26** (1.30)	-3.01* (1.61)	
Share 20–24	-1.55 (1.14)	-1.24 (1.13)	-1.29 (1.51)	-1.72 (1.63)	-1.08 (1.17)	-1.58 (1.63)	
Share 25–29	-3.61** (1.41)	-3.39** (1.41)	-3.38* (1.81)	-2.88 (1.84)	-3.16** (1.41)	-2.51 (1.81)	
Share 30–34	-2.39* (1.29)	-2.23* (1.29)	-1.95 (1.62)	-1.93 (1.81)	-1.99 (1.30)	-1.55 (1.83)	
Share 35–39	-2.53* (1.39)	-2.32* (1.40)	-2.01 (1.62)	-2.71 (2.01)	-2.90* (1.60)	-3.15 (2.24)	
Share 40–44	-2.24 (1.44)	-2.03 (1.41)	-2.13 (1.77)	-1.08 (1.76)	-1.58 (1.41)	-0.74 (1.74)	
Share 45–49	-1.83 (1.47)	-1.82 (1.46)	-1.72 (1.91)	-2.39 (2.15)	-1.66 (1.46)	-1.97 (2.09)	
Share 55–59	-3.75** (1.85)	-3.51* (1.84)	-3.88* (2.32)	-2.71 (2.40)	-3.36* (1.83)	-2.52 (2.38)	
Share 60–64	-4.95*** (1.40)	-4.92*** (1.39)	-5.50*** (1.73)	-5.40*** (1.67)	-5.05*** (1.36)	-5.40*** (1.62)	
Share 65+	-1.44 (1.65)	-1.48 (1.61)	-1.48 (1.80)	-2.28 (2.08)	-1.43 (1.67)	-2.33 (2.20)	
△ Share high-skill	0.69 (0.50)	0.51 (0.51)	0.37 (0.46)	0.56 (0.50)	-1.35 (2.08)	-0.93 (2.29)	
Share high-skill ($t-1$)	0.68*** (0.22)	0.55** (0.25)	0.34 (0.26)	0.60** (0.25)	0.78* (0.40)	0.83* (0.42)	
Cohort shares (p -value)	0.00	0.02	0.01	0.00	0.01	0.00	
Skill shares (p -value)	0.01	0.07	0.30	0.05	0.02	0.03	
First stage F -statistic				12.5	4.0	1.0	
Hansen test (p -value)				—	0.78	0.88	

Notes: Panel (a) reports results for demographic and human capital data by IIASA-VID (Lutz et al., 2007), Panel (b) for data from Barro and Lee (2013). The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w. are measured in logarithms (coefficients unreported). Column (4) corrects for the dynamic-panel bias using the Bruno (2005) estimator. The p -value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) or high-skill shares are jointly different from zero are reported. Instruments are shifted age cohorts in Column (5); the lagged share of high skills of the edge of the working-age population in Column (6); and a combination of both in Column (7). See Figure A3 for an illustration. First stage F -statistic reports the first stage Kleibergen-Paap rk Wald F -statistic. Hansen test p -values refer to the robust overidentifying restriction test. Standard errors are clustered at the country level. Asterisks indicate significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A3: Robustness: Levels Model Without Lagged Dependent Variable

	Demography	Skills	Demography & Skills	Demography Instrumented	Skills Instrumented	Both Instrumented
	(1)	(2)	(3)	(4)	(5)	(6)
Share < 20	-5.56*** (1.14)		-3.77*** (1.22)	-4.46*** (1.43)	-2.80** (1.32)	-3.32** (1.56)
Share 20–24	-1.65 (1.11)		-0.56 (1.14)	-2.35* (1.35)	0.03 (1.19)	-1.75 (1.35)
Share 25–29	-4.41*** (1.19)		-3.41*** (1.19)	-2.91** (1.41)	-2.87** (1.19)	-2.42* (1.43)
Share 30–34	-3.79*** (1.20)		-3.04*** (1.15)	-4.56*** (1.34)	-2.63** (1.16)	-4.18*** (1.35)
Share 35–39	-3.63*** (1.28)		-3.02** (1.30)	-2.15 (1.36)	-2.69** (1.30)	-1.72 (1.34)
Share 40–44	-1.87 (1.26)		-1.45 (1.23)	-1.71 (1.38)	-1.22 (1.21)	-1.66 (1.36)
Share 45–49	-2.12* (1.14)		-1.94* (1.12)	-2.49* (1.34)	-1.85* (1.10)	-2.47* (1.32)
Share 55–59	-2.02 (1.30)		-1.60 (1.29)	-0.89 (1.37)	-1.37 (1.27)	-0.83 (1.34)
Share 60–64	-5.25*** (1.32)		-5.32*** (1.28)	-5.66*** (1.39)	-5.35*** (1.26)	-5.95*** (1.39)
Share 65+	-2.40 (1.72)		-2.84* (1.68)	-3.97** (1.69)	-3.08* (1.69)	-3.95** (1.75)
Share high-skill		2.64*** (0.52)	2.32*** (0.70)	1.80** (0.80)	3.59*** (1.09)	3.24*** (1.19)
Capital p.w.	0.56*** (0.04)	0.57*** (0.04)	0.56*** (0.04)	0.56*** (0.04)	0.57*** (0.04)	0.56*** (0.04)
Cohort shares (<i>p</i> -value)	0.00		0.00	0.00	0.00	0.00
Skill share (<i>p</i> -value)		0.00	0.00	0.02	0.00	0.01
First stage <i>F</i> -statistic				13.2	27.4	4.5
Hansen test (<i>p</i> -value)				—	0.37	0.59
Countries	120	120	120	120	120	120
Observations	1,098	1,098	1,098	1,098	1,098	1,098
<i>R</i> ²	0.80	0.80	0.81	0.80	0.80	0.80

Notes: This table reports results for demographic and human capital data by IIASA-VID (Lutz et al., 2007). The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Capital p.w., measured in logarithms, is included as control in all specifications. The *p*-value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) or high-skill shares are jointly different from zero are reported. Instruments are shifted age cohorts in Column (5) (see Figure A3); the lagged shares of high skills of cohorts at the edge of the working-age population in Column (6); and a combination of both in Column (7). First stage *F*-statistic reports the first stage Kleibergen-Paap robust *F*-statistic. Hansen test *p*-values refer to the robust overidentifying restriction test. Standard errors are clustered at the country level. Asterisks indicate significance levels:
* *p* < 0.1; ** *p* < 0.05; *** *p* < 0.01.

Table A4: Robustness: Alternative Instrumentation of Human Capital (Levels)

	Inflow and Outflow (Baseline)		Inflow and Outflow GMM		Outflow Only	
	(1)	(2)	(3)	(4)	(5)	(6)
Share < 20	-2.09*	-2.53**	-1.79	-2.31**	-1.87	-2.31**
	(1.20)	(1.18)	(1.18)	(1.16)	(1.18)	(1.17)
Share 20–24	-1.16	-2.58*	-0.93	-2.25*	-1.01	-2.45*
	(1.11)	(1.36)	(1.09)	(1.32)	(1.09)	(1.33)
Share 25–29	-2.58*	-2.30	-2.27*	-2.05	-2.45*	-2.16
	(1.32)	(1.41)	(1.30)	(1.39)	(1.30)	(1.39)
Share 30–34	-2.33*	-3.61**	-2.37*	-3.72***	-2.24*	-3.56**
	(1.21)	(1.41)	(1.21)	(1.40)	(1.21)	(1.41)
Share 35–39	-3.33**	-2.49*	-2.95**	-1.93	-3.24**	-2.39
	(1.39)	(1.51)	(1.35)	(1.42)	(1.37)	(1.47)
Share 40–44	-1.12	-1.81	-0.66	-1.46	-1.07	-1.80
	(1.26)	(1.39)	(1.19)	(1.35)	(1.24)	(1.39)
Share 45–49	-2.92**	-3.89**	-2.71**	-3.64**	-2.89**	-3.89**
	(1.37)	(1.51)	(1.35)	(1.50)	(1.36)	(1.51)
Share 55–59	-4.00**	-4.16**	-3.59**	-3.79**	-3.91**	-4.11**
	(1.74)	(1.77)	(1.70)	(1.73)	(1.72)	(1.75)
Share 60–64	-5.53***	-6.33***	-5.29***	-6.10***	-5.53***	-6.38***
	(1.30)	(1.48)	(1.29)	(1.47)	(1.30)	(1.48)
Share 65+	-3.47**	-4.22**	-3.28**	-3.88**	-3.52**	-4.02**
	(1.56)	(1.68)	(1.55)	(1.65)	(1.58)	(1.68)
Share high-skill	2.45***	2.35***	2.56***	2.44***	2.77***	2.64***
	(0.76)	(0.77)	(0.75)	(0.77)	(0.80)	(0.82)
Output p.w. ($t-1$)	0.46***	0.46***	0.46***	0.45***	0.46***	0.45***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Capital p.w.	0.35***	0.34***	0.34***	0.34***	0.35***	0.35***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Cohort shares (p -value)	0.00	0.00	0.00	0.01	0.00	0.01
Skill share (p -value)	0.00	0.00	0.00	0.00	0.00	0.00
First stage F -statistic	27.9	4.5	27.9	4.53	59.7	5.4
Hansen test (p -value)	0.25	0.28	0.25	0.28	—	—
Countries	120	120	120	120	120	120
Observations	1,098	1,098	1,098	1,098	1,098	1,098
R^2	0.86	0.86	0.86	0.86	0.86	0.86

Notes: This table reports results for demographic and human capital data by IIASA-VID (Lutz et al., 2007). The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w., measured in logarithms, are included as controls in all specifications. The p -value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) or high-skill shares are jointly different from zero are reported. Instruments are shifted shares of high skills for the 15–19 year olds (inflow) and the 65–69 year olds (outflow); and shifted age cohorts in all even columns. See Figure A3 for an illustration. First stage F -statistic reports the first stage Kleibergen-Paap rk Wald F -statistic. Hansen test p -values refer to the robust overidentifying restriction test. Standard errors are clustered at the country level. Asterisks indicate significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A5: Robustness: Barro-Lee Data (Levels)

	Demography	Skills	Demography	Bias	Demography	Skills	Both
	(1)	(2)	& Skills	Correction	Instrumented	Instrumented	Instrumented
Share < 20	-3.64*** (1.17)		-3.18*** (1.20)	-2.88** (1.44)	-3.03* (1.56)	-2.86** (1.15)	-2.60* (1.47)
Share 20–24	-1.55 (1.14)		-1.24 (1.13)	-1.29 (1.50)	-1.72 (1.63)	-1.02 (1.09)	-1.50 (1.58)
Share 25–29	-3.61** (1.41)		-3.39** (1.42)	-3.37* (1.81)	-2.89 (1.88)	-3.24** (1.38)	-2.68 (1.82)
Share 30–34	-2.39* (1.29)		-2.23* (1.28)	-1.96 (1.61)	-1.93 (1.81)	-2.11* (1.25)	-1.65 (1.79)
Share 35–39	-2.53* (1.39)		-2.31* (1.38)	-2.02 (1.61)	-2.71 (2.01)	-2.15 (1.35)	-2.49 (1.95)
Share 40–44	-2.24 (1.44)		-2.04 (1.42)	-2.13 (1.76)	-1.08 (1.78)	-1.89 (1.36)	-0.92 (1.75)
Share 45–49	-1.83 (1.47)		-1.82 (1.46)	-1.72 (1.91)	-2.40 (2.19)	-1.82 (1.43)	-2.21 (2.14)
Share 55–59	-3.75** (1.85)		-3.51* (1.83)	-3.89* (2.30)	-2.71 (2.40)	-3.33* (1.77)	-2.46 (2.34)
Share 60–64	-4.95*** (1.40)		-4.91*** (1.39)	-5.49*** (1.72)	-5.41*** (1.68)	-4.89*** (1.37)	-5.41*** (1.68)
Share 65–69	-1.44 (1.65)		-1.47 (1.60)	-1.47 (1.78)	-2.28 (2.07)	-1.50 (1.57)	-2.10 (2.04)
Share high-skill		0.68*** (0.22)	0.55** (0.24)	0.36* (0.23)	0.60** (0.24)	0.94** (0.37)	0.96** (0.38)
Output p.w. ($t-1$)	0.53*** (0.05)	0.52*** (0.05)	0.51*** (0.05)	0.64*** (0.03)	0.51*** (0.05)	0.50*** (0.05)	0.50*** (0.05)
Capital p.w.	0.27*** (0.04)	0.28*** (0.04)	0.28*** (0.04)	0.23*** (0.02)	0.29*** (0.04)	0.29*** (0.04)	0.29*** (0.04)
Cohort shares (p -value)	0.00		0.02	0.01	0.00	0.02	0.00
Skill share (p -value)		0.00	0.02	0.12	0.02	0.01	0.01
First stage F -statistic					12.6	27.8	5.1
Hansen test (p -value)					—	0.30	0.45
Countries	139	139	139	139	138	139	138
Observations	1,259	1,259	1,259	1,211	1,248	1,259	1,248
R^2	0.84	0.84	0.84		0.84	0.81	0.84

Notes: This table reports results for demographic and human capital data by Barro and Lee (2013). The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w. are measured in logarithms. Column (4) corrects for the dynamic-panel bias using the Bruno (2005) estimator. The p -value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) or high-skill shares are jointly different from zero are reported. Instruments are shifted age cohorts in Column (5); the lagged shares of high skills of cohorts at the edge of the working-age population in Column (6); and a combination of both in Column (7). See Figure A3 for an illustration. First stage F -statistic reports the first stage Kleibergen-Paap rk Wald F -statistic. Hansen test p -values refer to the robust overidentifying restriction test. Standard errors are clustered at the country level. Asterisks indicate significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A6: Robustness: Barro-Lee Data (Differences)

	Demography	Skills	Demography	Bias	Demography	Skills	Both
	(1)	(2)	& Skills	Correction	Instrumented	Instrumented	Instrumented
Δ Share < 20	-3.16*** (1.01)		-2.66*** (1.01)	-1.61* (0.98)	-4.13*** (1.39)	-2.84** (1.12)	-4.66*** (1.70)
Δ Share 20–24	-2.52*** (0.93)		-1.92** (0.91)	-1.58* (0.92)	-3.14** (1.44)	-2.06* (1.10)	-3.63** (1.68)
Δ Share 25–29	-3.16*** (1.03)		-2.70*** (1.01)	-1.90* (1.13)	-4.08*** (1.57)	-2.82** (1.11)	-4.58** (1.87)
Δ Share 30–34	-2.99*** (1.08)		-2.57** (1.08)	-2.45** (1.20)	-3.21** (1.56)	-2.40** (1.10)	-3.58** (1.78)
Δ Share 35–39	-3.38*** (1.14)		-2.89** (1.15)	-2.47** (1.24)	-3.80** (1.78)	-3.23** (1.32)	-4.27** (2.01)
Δ Share 40–44	-2.53** (1.11)		-2.12* (1.10)	-1.12 (0.97)	-2.18 (1.36)	-2.17* (1.15)	-2.55* (1.49)
Δ Share 45–49	-2.41** (1.09)		-2.20** (1.08)	-0.85 (0.93)	-3.12** (1.56)	-2.14** (1.08)	-3.26** (1.62)
Δ Share 55–59	-2.08** (1.02)		-1.96* (1.02)	-0.95 (1.00)	-1.75 (1.17)	-1.88* (1.03)	-1.86 (1.24)
Δ Share 60–64	-5.06*** (1.22)		-5.07*** (1.24)	-3.08*** (1.09)	-4.83*** (1.44)	-5.20*** (1.23)	-4.85*** (1.46)
Δ Share 65+	-5.56*** (1.66)		-5.31*** (1.65)	-1.92 (1.50)	-5.19*** (1.97)	-5.50*** (1.72)	-5.38** (2.13)
Δ Share high-skill		1.07** (0.48)	0.94** (0.47)	0.64* (0.34)	0.91* (0.47)	0.34 (1.89)	-0.30 (2.18)
Share high-skill (<i>t</i> –1)		0.63*** (0.20)	0.61*** (0.20)	0.37*** (0.10)	0.61*** (0.23)	0.63*** (0.20)	0.52** (0.24)
Output p.w. (<i>t</i> –1)		-0.24*** (0.03)	-0.26*** (0.03)	-0.25*** (0.03)	-0.03*** (0.01)	-0.27*** (0.03)	-0.26*** (0.03)
Δ Capital p.w.		0.36*** (0.04)	0.36*** (0.04)	0.37*** (0.04)	0.39*** (0.04)	0.36*** (0.04)	0.36*** (0.04)
Cohort shares (<i>p</i> -value)	0.01		0.02	0.16	0.00	0.00	0.01
Skills shares (<i>p</i> -value)		0.00	0.00	0.00	0.01	0.00	0.04
First stage <i>F</i> -statistic					6.8	6.5	0.8
AR(2) test (<i>p</i> -value)				0.34			
Hansen test (<i>p</i> -value)				0.21	—	0.07	0.09
Countries	139	139	139	139	138	139	138
Observations	1,259	1,259	1,259	1,120	1,200	1,211	1,200
<i>R</i> ²	0.37	0.36	0.38		0.39	0.39	0.38

Notes: This table reports results for demographic and human capital data by Barro and Lee (2013). The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w. are measured in logarithms. Column (4) corrects for the dynamic-panel bias using the system GMM estimator by Arellano and Bover (1995) and Blundell and Bond (1998). The *p*-value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) or high-skill shares are jointly different from zero are reported. Instruments are shifted age cohorts in Column (5); the lagged shares of high skills of cohorts at the edge of the working-age population in Column (6); and a combination of both in Column (7). See Figure A3 for an illustration. First stage *F*-statistic reports the first stage Kleibergen-Paap rk Wald *F*-statistic. Hansen test *p*-values refer to the robust overidentifying restriction test. For system GMM, also the *p*-values of the AR(2) test are reported. Standard errors are clustered at the country level. Asterisks indicate significance levels: * *p* < 0.1; ** *p* < 0.05; *** *p* < 0.01.

Table A7: Robustness: Ten-Year Cohorts (Levels)

	Demography	Skills	Demography	Bias	Demography	Skills	Both
	(1)	(2)	(3)	Correction	Instrumented	Instrumented	Instrumented
(a) IIASA-VID sample							
Share < 20	-4.19*** (1.03)		-2.89*** (1.02)	-2.23 (1.46)	-3.30*** (1.13)	-1.79 (1.14)	-2.13* (1.28)
Share 20–29	-2.26** (0.92)		-1.56 (0.95)	-0.93 (1.36)	-1.90* (1.08)	-0.97 (1.00)	-1.20 (1.12)
Share 30–39	-2.82*** (0.92)		-2.43*** (0.92)	-1.87 (1.24)	-2.57** (1.01)	-2.11** (0.92)	-2.31** (1.01)
Share 40–49	-2.17* (1.11)		-1.93* (1.09)	-1.29 (1.83)	-2.35* (1.23)	-1.73 (1.08)	-2.07* (1.21)
Share 60+	-5.68*** (1.38)		-5.83*** (1.34)	-6.09*** (2.04)	-5.84*** (1.34)	-5.95*** (1.34)	-5.89*** (1.35)
Share high-skill		1.81*** (0.47)	1.78*** (0.52)	1.35** (0.64)	1.65*** (0.53)	3.26*** (0.94)	3.17*** (0.97)
Output p.w. ($t-1$)	0.22*** (0.04)	0.17*** (0.04)	0.19*** (0.04)	0.38*** (0.08)	0.19*** (0.04)	0.16*** (0.05)	0.16*** (0.04)
Capital p.w.	0.47*** (0.04)	0.49*** (0.04)	0.48*** (0.04)	0.42*** (0.04)	0.48*** (0.04)	0.50*** (0.04)	0.50*** (0.04)
Cohort shares (p -value)	0.00		0.00	0.02	0.00	0.00	0.00
Skill share (p -value)		0.00	0.00	0.03	0.00	0.00	0.00
First stage F -statistic					121.8	30.0	8.0
Hansen test (p -value)					—	0.32	0.33
Countries	120	120	120	120	119	119	119
Observations	541	541	541	496	540	540	540
R^2	0.82	0.82	0.83		0.83	0.82	0.82
(b) Barro-Lee sample							
Share < 20	-3.95*** (1.24)		-3.08** (1.29)	-2.52* (1.38)	-3.14*** (1.20)	-2.36* (1.33)	-2.43** (1.20)
Share 20–29	-2.19** (0.98)		-1.80* (0.98)	-1.55 (1.29)	-2.01* (1.15)	-1.47 (0.98)	-1.68 (1.17)
Share 30–39	-2.51** (1.07)		-2.22** (1.08)	-1.75 (1.07)	-2.21** (1.08)	-1.99* (1.09)	-1.96* (1.11)
Share 40–49	-2.09* (1.20)		-1.86 (1.19)	-1.51 (1.51)	-2.20 (1.43)	-1.68 (1.17)	-1.95 (1.43)
Share 60+	-4.77*** (1.58)		-4.67*** (1.54)	-4.99** (2.14)	-5.59*** (1.46)	-4.59*** (1.52)	-5.51*** (1.44)
Share high-skill		1.20*** (0.32)	0.97*** (0.36)	0.73* (0.43)	1.09*** (0.37)	1.76*** (0.65)	1.85*** (0.68)
Output p.w. ($t-1$)	0.25*** (0.05)	0.21*** (0.05)	0.22*** (0.05)	0.36*** (0.07)	0.23*** (0.05)	0.19*** (0.05)	0.20*** (0.05)
Capital p.w.	0.41*** (0.04)	0.44*** (0.04)	0.43*** (0.04)	0.38*** (0.05)	0.43*** (0.04)	0.44*** (0.04)	0.45*** (0.04)
Cohort shares (p -value)	0.01		0.03	0.23	0.00	0.04	0.00
Skill share (p -value)		0.00	0.01	0.09	0.00	0.01	0.01
First stage F -statistic					23.8	20.0	5.8
Hansen test (p -value)					—	0.24	0.39
Countries	139	139	139	139	137	138	137
Observations	621	621	621	573	615	620	615
R^2	0.78	0.78	0.78		0.78	0.78	0.78

Notes: Panel (a) reports results for demographic and human capital data by IIASA-VID (Lutz et al., 2007), Panel (b) for data from Barro and Lee (2013). The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w. are measured in logarithms. Column (4) corrects for the dynamic-panel bias using the Bruno (2005) estimator. The p -value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) or high-skill shares are jointly different from zero are reported. Instruments are shifted age cohorts in Column (5); the lagged share of high skills of the edge of the working-age population in Column (6); and a combination of both in Column (7). See Figure A3 for an illustration. First stage F -statistic reports the first stage Kleibergen-Paap rk Wald F -statistic. Hansen test p -values refer to the robust overidentifying restriction test. Standard errors are clustered at the country level. Asterisks indicate significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A8: Robustness: Ten-Year Cohorts (Differences)

	Demography	Skills	Demography & Skills	Bias Correction	Demography Instrumented	Skills Instrumented	Both Instrumented
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(a) IIASA-VID sample							
Δ Share < 20	-3.87*** (0.97)		-2.67*** (0.99)	-3.01** (1.20)	-2.31** (1.08)	-4.42*** (1.16)	-3.60*** (1.26)
Δ Share 20–29	-2.68*** (0.80)		-1.77** (0.84)	-1.92** (0.94)	-2.34** (1.06)	-2.70*** (0.88)	-2.89*** (1.05)
Δ Share 30–39	-3.00*** (0.82)		-2.53*** (0.87)	-2.95*** (1.04)	-2.82** (1.11)	-2.49** (0.97)	-2.19* (1.24)
Δ Share 40–49	-2.50*** (0.78)		-2.30*** (0.75)	-2.53*** (0.81)	-2.95*** (0.91)	-2.54*** (0.84)	-2.37** (0.98)
Δ Share 60+	-5.28*** (0.94)		-5.03*** (0.93)	-4.47*** (0.93)	-4.26*** (1.05)	-5.26*** (0.96)	-5.05*** (1.18)
Δ Share high-skill		4.05*** (0.96)	3.44*** (1.07)	2.35*** (0.79)	3.95*** (1.06)	-2.04 (3.16)	-2.46 (3.30)
Share high-skill (<i>t</i> –1)		1.10** (0.46)	1.08** (0.49)	0.51* (0.28)	0.90 (0.62)	1.58*** (0.61)	1.51** (0.73)
Output p.w. (<i>t</i> –1)	-0.41*** (0.05)	-0.47*** (0.05)	-0.45*** (0.05)	-0.03*** (0.01)	-0.49*** (0.05)	-0.46*** (0.05)	-0.46*** (0.05)
Δ Capital p.w.	0.40*** (0.05)	0.40*** (0.05)	0.41*** (0.05)	0.52*** (0.05)	0.41*** (0.05)	0.40*** (0.05)	0.40*** (0.05)
Cohort shares (<i>p</i> -value)	0.00		0.00	0.00	0.00	0.00	0.00
Skills shares (<i>p</i> -value)		0.00	0.00	0.00	0.00	0.03	0.11
First stage <i>F</i> -statistic					49.1	31.8	8.1
AR(2) test (<i>p</i> -value)				0.13			
Hansen test (<i>p</i> -value)				0.75	—	0.14	0.11
Countries	120	120	120	119	119	119	119
Observations	541	541	541	421	495	495	495
R ²	0.58	0.56	0.60		0.60	0.60	0.60
(b) Barro-Lee sample							
Δ Share < 20	-2.93*** (1.03)		-2.27** (1.03)	-3.61*** (1.16)	-2.96** (1.38)	-3.38*** (1.30)	-3.77** (1.67)
Δ Share 20–29	-2.02** (0.79)		-1.47* (0.79)	-2.11** (0.85)	-2.22** (1.05)	-2.15** (1.03)	-2.88** (1.38)
Δ Share 30–39	-2.15** (0.83)		-1.66* (0.84)	-2.72*** (0.97)	-1.69 (1.13)	-2.17** (1.04)	-2.39* (1.44)
Δ Share 40–49	-2.06** (0.84)		-1.75** (0.84)	-1.95** (0.90)	-1.43 (1.03)	-2.33** (0.93)	-1.94 (1.18)
Δ Share 60+	-4.74*** (1.00)		-4.61*** (1.01)	-4.13*** (1.03)	-4.72*** (1.14)	-4.72*** (1.04)	-4.89*** (1.17)
Δ Share high-skill		1.28** (0.56)	0.99* (0.53)	0.60 (0.49)	1.08** (0.54)	-0.58 (1.75)	-1.05 (2.07)
Share high-skill (<i>t</i> –1)		1.10*** (0.39)	1.06*** (0.39)	0.82*** (0.21)	1.15*** (0.44)	0.84 (0.53)	0.62 (0.65)
Output p.w. (<i>t</i> –1)	-0.43*** (0.05)	-0.48*** (0.05)	-0.46*** (0.04)	-0.07** (0.01)	-0.51*** (0.05)	-0.48*** (0.05)	-0.48*** (0.05)
Δ Capital p.w.	0.32*** (0.05)	0.34*** (0.05)	0.34*** (0.05)	0.38*** (0.06)	0.31*** (0.05)	0.32*** (0.05)	0.31*** (0.05)
Cohort shares (<i>p</i> -value)	0.00		0.00	0.00	0.00	0.00	0.00
Skills shares (<i>p</i> -value)		0.00	0.01	0.00	0.01	0.04	0.12
First stage <i>F</i> -statistic					27.5	6.1	1.5
AR(2) test (<i>p</i> -value)				0.12			
Hansen test (<i>p</i> -value)				0.77	—	0.09	0.06
Countries	139	139	139	138	137	138	137
Observations	621	621	621	482	567	572	567
R ²	0.52	0.51	0.54		0.56	0.55	0.54

Notes: Panel (a) reports results for demographic and human capital data by IIASA-VID (Lutz et al., 2007), Panel (b) for data from Barro and Lee (2013). The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w. are measured in logarithms. Column (4) corrects for the dynamic-panel bias using the system GMM estimator by Arellano and Bover (1995) and Blundell and Bond (1998). The *p*-value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) or high-skill shares are jointly different from zero are reported. Instruments are shifted age cohorts in Column (5); the lagged share of high skills of the edge of the working-age population in Column (6); and a combination of both in Column (7). See Figure A3 for an illustration. First stage *F*-statistic reports the first stage Kleibergen-Paap rk Wald *F*-statistic. Hansen test *p*-values refer to the robust overidentifying restriction test. For system GMM, also the *p*-values of the AR(2) test are reported. Standard errors are clustered at the country level. Asterisks indicate significance levels: * *p* < 0.1; ** *p* < 0.05; *** *p* < 0.01.

Table A9: Robustness: Human Capital Granularity (Levels)

	Demography	Skills	Demography & Skills	Bias Correction	Demography Instrumented	Skills Instrumented	Both Instrumented
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Share < 20	-3.64*** (1.17)		-3.51*** (1.21)	-3.10** (1.48)	-3.53** (1.54)	-3.50*** (1.22)	-3.50** (1.52)
Share 20–24	-1.55 (1.14)		-1.36 (1.10)	-1.43 (1.52)	-1.93 (1.61)	-1.47 (1.11)	-2.19 (1.68)
Share 25–29	-3.61** (1.41)		-3.55** (1.43)	-3.45* (1.84)	-3.09 (1.89)	-3.57** (1.46)	-3.14* (1.90)
Share 30–34	-2.39* (1.29)		-2.42* (1.29)	-2.11 (1.63)	-2.35 (1.77)	-2.66** (1.28)	-2.59 (1.85)
Share 35–39	-2.53* (1.39)		-2.38* (1.38)	-2.08 (1.62)	-2.75 (2.00)	-2.44* (1.38)	-2.82 (2.02)
Share 40–44	-2.24 (1.44)		-2.21 (1.42)	-2.25 (1.77)	-1.39 (1.75)	-2.32* (1.39)	-1.68 (1.75)
Share 45–49	-1.83 (1.47)		-2.01 (1.45)	-1.84 (1.92)	-2.76 (2.20)	-2.29 (1.43)	-3.03 (2.27)
Share 55–59	-3.75** (1.85)		-3.64** (1.83)	-3.97* (2.30)	-3.09 (2.40)	-3.76** (1.82)	-3.27 (2.43)
Share 60–64	-4.95*** (1.40)		-5.15*** (1.43)	-5.65*** (1.75)	-5.59*** (1.71)	-5.03*** (1.48)	-5.61*** (1.73)
Share 65–69	-1.44 (1.65)		-1.77 (1.60)	-1.72 (1.76)	-2.76 (2.09)	-2.17 (1.58)	-3.08 (2.15)
Years of schooling < 4	0.01 (0.05)	0.01 (0.05)	0.02 (0.04)	0.01 (0.05)	0.00 (0.08)	-0.00 (0.08)	
4–6 years of schooling	-0.00 (0.03)	0.01 (0.04)	0.02 (0.03)	0.01 (0.03)	0.01 (0.05)	0.01 (0.05)	0.00 (0.05)
6–7 years of schooling	0.01 (0.02)	0.02 (0.02)	0.03 (0.03)	0.02 (0.02)	0.09 (0.09)	0.09 (0.09)	0.08 (0.09)
8–10 years of schooling	0.05** (0.02)	0.04* (0.02)	0.03 (0.03)	0.04* (0.02)	0.09 (0.06)	0.09 (0.06)	0.08 (0.06)
Years of schooling > 10	0.13*** (0.04)	0.11*** (0.04)	0.08* (0.05)	0.12*** (0.04)	0.20** (0.04)	0.20** (0.09)	0.20** (0.10)
Output p.w. ($t-1$)	0.53*** (0.05)	0.52*** (0.05)	0.51*** (0.05)	0.65*** (0.03)	0.51*** (0.05)	0.51*** (0.05)	0.51*** (0.05)
Capital p.w.	0.27*** (0.04)	0.28*** (0.04)	0.28*** (0.04)	0.23*** (0.02)	0.28*** (0.04)	0.28*** (0.04)	0.28*** (0.04)
Cohort shares (p -value)	0.00		0.01	0.01	0.00	0.08	0.05
Skill share (p -value)		0.00	0.01	0.42	0.01	0.07	0.07
First stage F -statistic					12.7	10.5	3.4
Countries	139	139	139	139	138	139	138
Observations	1,259	1,259	1,259	1,211	1,248	1,259	1,248
R^2	0.84	0.84	0.84		0.84	0.84	0.84

Notes: This table reports results for demographic and human capital data by Barro and Lee (2013). The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w. are measured in logarithms. Column (4) corrects for the dynamic-panel bias using the Bruno (2005) estimator. The p -value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) or high-skill shares are jointly different from zero are reported. Instruments are shifted age cohorts in Column (5); the lagged years of schooling (6); and a combination of both in Column (7). See Panel (a) of Figure A3 for an illustration. First stage F -statistic reports the first stage Kleibergen-Paap rk Wald F -statistic. Standard errors are clustered at the country level. Asterisks indicate significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A10: Robustness: Income Per Capita

	Demography	Skills	Demography & Skills	Bias Correction	Demography Instrumented	Skills Instrumented	Both Instrumented
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Share < 20	-3.41** (1.41)		-2.60* (1.40)	-2.45* (1.49)	-4.56** (1.89)	-1.84 (1.42)	-3.40* (1.84)
Share 20–24	-3.06*** (1.11)		-2.43** (1.09)	-2.52* (1.43)	-3.50** (1.49)	-1.83* (1.10)	-2.99** (1.47)
Share 25–29	-4.41*** (1.42)		-3.89*** (1.39)	-4.03** (1.71)	-3.39** (1.59)	-3.41** (1.35)	-2.98* (1.54)
Share 30–34	-2.96** (1.22)		-2.58** (1.19)	-2.66 (1.71)	-3.66*** (1.41)	-2.23* (1.18)	-3.35** (1.40)
Share 35–39	-5.05*** (1.38)		-4.67*** (1.38)	-4.78*** (1.77)	-3.83** (1.58)	-4.31*** (1.35)	-3.38** (1.53)
Share 40–44	-1.80 (1.31)		-1.56 (1.28)	-1.73 (1.52)	-1.91 (1.42)	-1.33 (1.25)	-1.82 (1.40)
Share 45–49	-4.31*** (1.50)		-4.13*** (1.47)	-4.56** (2.21)	-4.72*** (1.78)	-3.96*** (1.43)	-4.62*** (1.75)
Share 55–59	-5.29*** (1.70)		-4.92*** (1.65)	-5.50** (2.23)	-4.75*** (1.83)	-4.57*** (1.59)	-4.50** (1.77)
Share 60–64	-5.95*** (1.41)		-5.94*** (1.37)	-6.67*** (1.76)	-6.35*** (1.54)	-5.93*** (1.33)	-6.54*** (1.52)
Share 65+	-3.61** (1.60)		-3.80** (1.58)	-4.20** (1.75)	-4.47** (1.74)	-3.97** (1.58)	-4.54** (1.77)
Dependency Ratio	-0.79** (0.39)	-1.19*** (0.36)	-0.80** (0.38)	-0.71* (0.37)	-1.32** (0.56)	-0.81** (0.38)	-1.25** (0.54)
Dependency Ratio ($t-1$)	-0.27 (0.51)	0.22 (0.36)	-0.25 (0.51)	-0.20 (0.48)	0.68 (0.81)	-0.24 (0.51)	0.53 (0.77)
Share high-skill		1.03*** (0.39)	1.22*** (0.40)	0.91*** (0.34)	0.95** (0.43)	2.37*** (0.74)	2.20*** (0.75)
Output p.c. ($t-1$)	0.54*** (0.04)	0.50*** (0.04)	0.51*** (0.04)	0.64*** (0.04)	0.50*** (0.04)	0.49*** (0.05)	0.48*** (0.05)
Capital p.w.	0.28*** (0.04)	0.28*** (0.04)	0.29*** (0.04)	0.24*** (0.02)	0.29*** (0.04)	0.30*** (0.05)	0.30*** (0.05)
Cohort shares (p -value)	0.00		0.00	0.00	0.00	0.00	0.00
Skill share (p -value)		0.01	0.00	0.01	0.03	0.00	0.00
First stage F -statistic					13.2	28.7	6.7
Hansen test (p -value)					—	0.19	0.22
Countries	120	120	120	120	120	120	120
Observations	1,098	1,098	1,098	1,053	1,098	1,098	1,098
R^2	0.88	0.88	0.89		0.88	0.88	0.88

Notes: This table reports results for demographic and human capital data by IIASA-VID (Lutz et al., 2007). The dependent variable is log output per capita. All regressions include country-specific fixed and time effects. Lagged output p.c., capital p.w. and the (lagged) dependency ratio, measured in logarithms, are included as controls in all specifications. Column (4) corrects for the dynamic-panel bias using the Bruno (2005) estimator. The p -value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) or high-skill shares are jointly different from zero are reported. Instruments are shifted age cohorts in Column (5); the lagged shares of high skills of cohorts at the edge of the working-age population in Column (6); and a combination of both in Column (7). See Figure A3 for an illustration. First stage F -statistic reports the first stage Kleibergen-Paap rk Wald F -statistic. Hansen test p -values refer to the robust overidentifying restriction test. Standard errors are clustered at the country level. Asterisks indicate significance levels:
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A11: Heterogeneity: Accounting for Human Capital Differences Between Cohorts

	Demography & Skills		Bias Correction		Skills	
					Instrumented	
	IIASA-VID	Barro-Lee	IIASA-VID	Barro-Lee	IIASA-VID	Barro-Lee
	(1)	(2)	(3)	(4)	(5)	(6)
Share < 20	-2.59** (1.20)	-3.16*** (1.16)	-2.55** (1.22)	-2.64* (1.37)	-1.91 (1.75)	-2.63 (1.92)
Share 20–24	-1.04 (1.13)	-1.07 (1.14)	-1.00 (1.31)	-0.96 (1.43)	-1.99 (1.75)	-0.50 (2.18)
Share 25–29	-2.07 (1.41)	-2.97** (1.43)	-2.15 (1.57)	-2.73 (1.76)	-1.53 (2.14)	-2.56 (1.86)
Share 30–34	-2.02 (1.24)	-2.11* (1.26)	-2.07 (1.63)	-1.67 (1.59)	-1.86 (1.62)	-1.80 (1.46)
Share 35–39	-2.77* (1.47)	-2.21 (1.39)	-2.72 (1.67)	-1.69 (1.58)	-2.30 (1.96)	-1.69 (2.16)
Share 40–44	-0.58 (1.27)	-1.86 (1.35)	-0.62 (1.45)	-1.77 (1.69)	-0.33 (1.69)	-1.32 (2.17)
Share 45–49	-2.36* (1.40)	-1.77 (1.50)	-2.65 (2.07)	-1.51 (1.87)	-2.35 (2.13)	-1.74 (1.65)
Share 55–59	-3.39* (1.78)	-3.02* (1.74)	-3.64* (1.96)	-2.97 (2.10)	-3.07 (2.24)	-2.46 (2.67)
Share 60–64	-4.78*** (1.28)	-4.49*** (1.46)	-5.24*** (1.63)	-4.85*** (1.71)	-4.99*** (1.70)	-3.94* (2.10)
Share 65+	-2.19 (1.56)	-1.18 (1.57)	-2.30 (1.62)	-0.97 (1.79)	-0.95 (3.18)	-0.72 (1.88)
Share high-skill < 20	0.53 (0.37)	-0.27 (0.23)	0.39 (0.66)	-0.21 (0.26)	-1.76 (2.22)	-0.70 (2.11)
Share high-skill 20–24	-0.52*** (0.19)	0.22* (0.11)	-0.43* (0.23)	0.22 (0.15)	-1.11 (1.05)	1.16 (3.78)
Share high-skill 25–29	1.16*** (0.35)	0.07 (0.12)	1.01*** (0.38)	0.04 (0.17)	6.19 (6.92)	-0.58 (2.69)
Share high-skill 30–34	0.46 (0.43)	0.03 (0.18)	0.31 (0.52)	-0.03 (0.24)	-9.38 (12.76)	-0.03 (0.41)
Share high-skill 35–39	-1.04* (0.62)	-0.31 (0.27)	-1.09* (0.65)	-0.33 (0.45)	6.13 (9.39)	-0.44 (1.06)
Share high-skill 40–44	0.12 (0.54)	-0.17 (0.31)	0.25 (0.64)	-0.25 (0.45)	-1.51 (2.39)	-0.05 (0.78)
Share high-skill 45–49	0.44 (0.59)	-0.39 (0.34)	0.40 (0.80)	-0.55 (0.51)	0.21 (0.74)	-0.35 (0.76)
Share high-skill 50–54	-0.31 (0.71)	0.70 (0.47)	-0.39 (0.84)	0.77 (0.53)	-0.51 (0.78)	0.36 (0.74)
Share high-skill 55–59	0.61 (0.62)	0.55 (0.56)	-0.52 (0.90)	0.71 (0.63)	-1.64 (1.68)	0.74 (0.97)
Share high-skill 60–64	0.86 (0.59)	-0.07 (0.44)	0.89 (0.82)	-0.13 (0.59)	1.07 (0.84)	0.97 (3.59)
Share high-skill 65+	0.78 (0.55)	0.13 (0.41)	0.76 (0.66)	0.13 (0.48)	0.64 (0.86)	-0.76 (2.76)
Output p.w. ($t-1$)	0.46*** (0.05)	0.52*** (0.05)	0.57*** (0.04)	0.66*** (0.03)	0.47*** (0.05)	0.52*** (0.05)
Capital p.w.	0.35*** (0.05)	0.29*** (0.04)	0.30*** (0.02)	0.23*** (0.02)	0.33*** (0.05)	0.28*** (0.04)
Cohort shares (p -value)	0.01	0.04	0.00	0.08	0.04	0.22
Skill share (p -value)	0.00	0.11	0.00	0.10	0.02	0.35
First stage F -statistic					0.1	0.0
Countries	120	139	120	139	120	139
Observations	1,098	1,259	1,053	1,211	1,098	1,259
R^2	0.87	0.84			0.82	0.84

Notes: Columns (1), (3), and (5) report results for demographic and human capital data from IIASA-VID (Lutz et al., 2007), Columns (2), (4), and (6) for data by Barro and Lee (2013). The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w. are measured in logarithms. Columns (3) and (4) correct for the dynamic-panel bias using the Bruno (2005) estimator. Instruments are the lagged shares of high skills of cohorts at the edge of the working-age population in Columns (5) and (6); see Panel (c) of Figure A3 for an illustration. The p -value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) and the first stage Kleibergen-Paap rk Wald F -statistic are reported. The IV specification is just-identified. Standard errors are clustered at the country level. Asterisks indicate significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A12: Heterogeneity: Accounting for Human Capital Differences Between Cohorts

	Demography & Skills		Bias Correction		Skills	
					Instrumented	
	IIASA-VID	Barro-Lee	IIASA-VID	Barro-Lee	IIASA-VID	Barro-Lee
	(1)	(2)	(3)	(4)	(5)	(6)
Share < 20	-3.33*** (1.21)	-3.41*** (1.18)	-3.08** (1.25)	-2.86** (1.39)	-3.34*** (1.19)	-3.39*** (1.16)
Share 20–24	-1.83 (1.13)	-1.13 (1.15)	-1.65 (1.39)	-1.05 (1.46)	-1.83* (1.11)	-1.11 (1.12)
Share 25–29	-3.37** (1.40)	-3.43** (1.43)	-3.21** (1.62)	-3.23* (1.77)	-3.37** (1.37)	-3.42** (1.40)
Share 30–34	-3.06** (1.25)	-2.26* (1.29)	-2.90* (1.63)	-1.81 (1.66)	-3.06** (1.22)	-2.26* (1.27)
Share 35–39	-3.68** (1.44)	-2.56* (1.35)	-3.47** (1.74)	-2.06 (1.57)	-3.68*** (1.41)	-2.56* (1.32)
Share 40–44	-1.67 (1.30)	-2.00 (1.44)	-1.54 (1.44)	-1.93 (1.70)	-1.67 (1.28)	-1.99 (1.41)
Share 45–49	-3.30** (1.40)	-1.94 (1.47)	-3.41 (2.13)	-1.71 (1.92)	-3.30** (1.37)	-1.95 (1.45)
Share 55–59	-4.50** (1.80)	-3.26* (1.82)	-4.59** (2.01)	-3.42 (2.16)	-4.50** (1.77)	-3.23* (1.78)
Share 60–64	-5.76*** (1.38)	-5.10*** (1.41)	-6.12*** (1.68)	-5.52*** (1.70)	-5.76*** (1.36)	-5.11*** (1.38)
Share 65+	-3.74** (1.55)	-1.69 (1.63)	-3.75** (1.64)	-1.58 (1.84)	-3.74** (1.52)	-1.70 (1.60)
Share high-skill 50–54	0.78** (0.31)	0.52*** (0.19)	0.69*** (0.25)	0.40* (0.22)	0.78*** (0.30)	0.56*** (0.21)
Rel. sh. high-skill < 20	-0.0001*** (0.0000)	0.00 (0.00)	-0.00 (0.00)	0.00 (0.01)	-0.0001*** (0.0000)	0.00 (0.00)
Rel. sh. high-skill 20–24	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	0.00 (0.01)	-0.00 (0.00)	0.00 (0.00)
Rel. sh. high-skill 25–29	0.00 (0.00)	0.00 (0.01)	0.00 (0.00)	-0.00 (0.01)	0.00 (0.00)	0.00 (0.01)
Rel. sh. high-skill 30–34	0.00 (0.00)	0.00 (0.01)	0.00 (0.00)	0.00 (0.01)	0.00 (0.00)	0.00 (0.01)
Rel. sh. high-skill 35–39	0.00 (0.00)	-0.01 (0.01)	0.00 (0.01)	-0.01 (0.01)	0.00 (0.00)	-0.01 (0.01)
Rel. sh. high-skill 40–44	0.00 (0.01)	-0.01 (0.01)	-0.00 (0.01)	-0.01 (0.02)	0.00 (0.01)	-0.01 (0.01)
Rel. sh. high-skill 45–49	0.02 (0.02)	0.01 (0.01)	0.02 (0.02)	0.01 (0.02)	0.02 (0.02)	0.01 (0.01)
Rel. sh. high-skill 55–59	0.01 (0.01)	0.04 (0.04)	0.01 (0.05)	0.05 (0.04)	0.01 (0.01)	0.04 (0.04)
Rel. sh. high-skill 60–64	0.01 (0.01)	-0.06 (0.04)	0.01 (0.03)	-0.06 (0.05)	0.01 (0.01)	-0.06 (0.04)
Rel. sh. high-skill 65+	0.03** (0.02)	0.03 (0.04)	0.03 (0.04)	0.04 (0.05)	0.03** (0.02)	0.03 (0.04)
Output p.w. ($t-1$)	0.48*** (0.05)	0.51*** (0.04)	0.59*** (0.04)	0.64*** (0.03)	0.48*** (0.05)	0.51*** (0.04)
Capital p.w.	0.35*** (0.05)	0.29*** (0.04)	0.31*** (0.02)	0.23*** (0.02)	0.35*** (0.05)	0.29*** (0.04)
Cohort shares (p -value)	0.01	0.01	0.00	0.01	0.00	0.00
Skill share (p -value)	0.00	0.00	0.31	0.81	0.00	0.00
First stage F -statistic					7.3e+5	2505.3
Countries	120	139	120	139	120	139
Observations	1,098	1,255	1,053	1,208	1,098	1,255
R^2	0.87	0.85			0.87	0.85

Notes: Columns (1), (3), and (5) report results for demographic and human capital data from IIASA-VID (Lutz et al., 2007), Columns (2), (4), and (6) for data by Barro and Lee (2013). The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w. are measured in logarithms. Columns (3) and (4) correct for the dynamic-panel bias using the Bruno (2005) estimator. Instruments are the lagged shares of high skills of cohorts at the edge of the working-age population in Columns (5) and (6); see Panel (c) of Figure A3 for an illustration. The p -value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) and the first stage Kleibergen-Paap rk Wald F -statistic are reported. The IV specification is just-identified. Standard errors are clustered at the country level. Asterisks indicate significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A13: Robustness: Controlling for the Dependency Ratio (Levels)

	Demography	Skills	Demography	Bias	Demography	Skills	Both
	(1)	(2)	& Skills	Correction	Instrumented	Instrumented	Instrumented
	(3)	(4)	(5)	(6)	(7)		
(a) IIASA-VID sample							
Share < 20	-3.45*** (1.26)		-2.70** (1.25)	-2.61* (1.40)	-3.37*** (1.27)	-1.71 (1.25)	-2.21* (1.24)
Share 20–24	-2.65** (1.08)		-2.10* (1.08)	-2.21 (1.38)	-3.46** (1.38)	-1.38 (1.08)	-2.79** (1.36)
Share 25–29	-3.56** (1.42)		-3.13** (1.39)	-3.22* (1.65)	-2.82* (1.46)	-2.56* (1.32)	-2.34* (1.40)
Share 30–34	-3.03** (1.28)		-2.71** (1.25)	-2.74* (1.66)	-3.96*** (1.43)	-2.29* (1.22)	-3.59** (1.41)
Share 35–39	-4.07*** (1.44)		-3.77*** (1.43)	-3.72** (1.73)	-3.03* (1.58)	-3.37** (1.39)	-2.54* (1.51)
Share 40–44	-1.66 (1.30)		-1.47 (1.28)	-1.55 (1.47)	-2.00 (1.39)	-1.22 (1.23)	-1.94 (1.37)
Share 45–49	-3.26** (1.43)		-3.14** (1.41)	-3.37 (2.14)	-4.02*** (1.55)	-2.98** (1.37)	-3.93*** (1.51)
Share 55–59	-4.63** (1.85)		-4.35** (1.81)	-4.75** (2.15)	-4.39** (1.83)	-3.96** (1.74)	-4.14** (1.77)
Share 60–64	-5.44*** (1.36)		-5.46*** (1.33)	-5.93*** (1.70)	-6.04*** (1.50)	-5.49*** (1.29)	-6.32*** (1.48)
Share 65+	-2.90* (1.60)		-3.09* (1.57)	-3.25* (1.67)	-4.16** (1.64)	-3.34** (1.57)	-4.20** (1.69)
Dependency ratio	-0.13 (0.13)	-0.16 (0.11)	-0.12 (0.13)	-0.11 (0.11)	-0.08 (0.13)	-0.11 (0.13)	-0.09 (0.12)
Share high-skill	0.89** (0.34)	1.08*** (0.40)	0.85*** (0.33)	0.84** (0.41)	2.51*** (0.76)	2.40*** (0.77)	
Cohort shares (<i>p</i> -value)	0.01		0.01	0.01	0.01	0.00	0.00
Skill share (<i>p</i> -value)		0.01	0.01	0.01	0.04	0.00	0.00
First stage <i>F</i> -statistic					12.6	28.6	4.7
Hansen test (<i>p</i> -value)					—	0.20	0.25
(b) Barro-Lee sample							
Share < 20	-3.63*** (1.22)		-3.15** (1.24)	-2.71* (1.48)	-3.08* (1.58)	-2.87** (1.20)	-2.65* (1.50)
Share 20–24	-1.64 (1.15)		-1.32 (1.12)	-1.56 (1.61)	-1.67 (1.67)	-1.13 (1.08)	-1.46 (1.63)
Share 25–29	-3.61** (1.42)		-3.38** (1.42)	-3.39** (1.65)	-2.88 (1.88)	-3.24** (1.38)	-2.68 (1.83)
Share 30–34	-2.46* (1.30)		-2.31* (1.30)	-2.08 (1.76)	-1.93 (1.81)	-2.23* (1.27)	-1.65 (1.79)
Share 35–39	-2.63* (1.38)		-2.41* (1.38)	-2.18 (1.67)	-2.69 (2.00)	-2.28* (1.34)	-2.49 (1.95)
Share 40–44	-2.24 (1.43)		-2.02 (1.40)	-2.19 (1.74)	-1.06 (1.78)	-1.90 (1.34)	-0.90 (1.75)
Share 45–49	-1.76 (1.48)		-1.77 (1.46)	-1.69 (2.24)	-2.39 (2.19)	-1.78 (1.44)	-2.21 (2.15)
Share 55–59	-3.70** (1.84)		-3.43* (1.82)	-3.82 (2.35)	-2.71 (2.40)	-3.27* (1.76)	-2.46 (2.33)
Share 60–64	-5.16*** (1.39)		-5.18*** (1.37)	-5.79*** (1.73)	-5.41*** (1.68)	-5.20*** (1.34)	-5.41*** (1.68)
Share 65+	-1.47 (1.66)		-1.48 (1.61)	-1.53 (1.90)	-2.29 (2.07)	-1.49 (1.58)	-2.12 (2.04)
Dependency ratio	-0.01 (0.14)	-0.09 (0.12)	-0.01 (0.14)	-0.01 (0.10)	0.02 (0.14)	-0.01 (0.13)	0.01 (0.14)
Share high-skill	0.71*** (0.22)	0.61** (0.24)	0.43** (0.20)	0.60* (0.25)	0.97** (0.38)	0.96** (0.39)	
Cohort shares (<i>p</i> -value)	0.00		0.01	0.01	0.00	0.00	0.00
Skill share (<i>p</i> -value)		0.00	0.01	0.03	0.02	0.01	0.01
First stage <i>F</i> -statistic					10.5	29.5	5.5
Hansen test (<i>p</i> -value)					—	0.47	0.47

Notes: Panel (a) reports results for demographic and human capital data by IIASA-VID (Lutz et al., 2007), Panel (b) for data from Barro and Lee (2013). The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w. are measured in logarithms (coefficients unreported). Column (4) corrects for the dynamic-panel bias using the Bruno (2005) estimator. The *p*-value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) or high-skill shares are jointly different from zero are reported. Instruments are shifted age cohorts in Column (5); the lagged share of high skills of the edge of the working-age population in Column (6); and a combination of both in Column (7). See Figure A3 for an illustration. First stage *F*-statistic reports the first stage Kleibergen-Paap rk Wald *F*-statistic. Hansen test *p*-values refer to the robust overidentifying restriction test. Standard errors are clustered at the country level. Asterisks indicate significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A14: Robustness: Population Scale Effects (in Logarithms)

	Demography	Skills	Demography & Skills	Bias Correction	Demography Instrumented	Skills Instrumented	Both Instrumented
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Share < 20	-3.54*** (1.13)		-3.06*** (1.16)	-3.04** (1.32)	-3.62*** (1.14)	-2.61** (1.21)	-3.06*** (1.15)
Share 20–24	-1.65 (1.05)		-1.39 (1.06)	-1.45 (1.42)	-2.71** (1.33)	-1.14 (1.08)	-2.47* (1.34)
Share 25–29	-3.08** (1.38)		-2.86** (1.37)	-2.97* (1.65)	-2.64* (1.44)	-2.64** (1.33)	-2.46* (1.40)
Share 30–34	-2.58** (1.18)		-2.43** (1.18)	-2.43 (1.67)	-3.50** (1.38)	-2.28* (1.17)	-3.39** (1.37)
Share 35–39	-3.60** (1.38)		-3.45** (1.38)	-3.48** (1.74)	-2.80* (1.52)	-3.31** (1.36)	-2.58* (1.50)
Share 40–44	-0.95 (1.23)		-0.90 (1.22)	-0.95 (1.49)	-1.48 (1.34)	-0.86 (1.19)	-1.52 (1.33)
Share 45–49	-2.67* (1.36)		-2.66* (1.35)	-2.95 (2.15)	-3.76** (1.48)	-2.65** (1.32)	-3.76** (1.47)
Share 55–59	-4.00** (1.66)		-3.90** (1.66)	-4.36** (2.16)	-4.11** (1.69)	-3.79** (1.64)	-4.05** (1.68)
Share 60–64	-5.35*** (1.33)		-5.38*** (1.32)	-5.87*** (1.70)	-6.10*** (1.47)	-5.41*** (1.29)	-6.25*** (1.47)
Share 65+	-4.52*** (1.49)		-4.45*** (1.48)	-4.41** (1.73)	-4.62*** (1.59)	-4.37*** (1.47)	-4.67*** (1.60)
Working-Age Population	-0.20*** (0.05)	-0.12** (0.05)	-0.17*** (0.05)	-0.14*** (0.05)	-0.17*** (0.05)	-0.14*** (0.05)	-0.14*** (0.05)
Share high-skill		0.70** (0.32)	0.72* (0.39)	0.55 (0.34)	0.51 (0.40)	1.42* (0.75)	1.34* (0.75)
Output p.w. ($t-1$)	0.46*** (0.05)	0.46*** (0.05)	0.46*** (0.05)	0.56*** (0.04)	0.46*** (0.05)	0.45*** (0.05)	0.45*** (0.05)
Capital p.w.	0.33*** (0.05)	0.33*** (0.05)	0.34*** (0.05)	0.29*** (0.02)	0.33*** (0.05)	0.34*** (0.05)	0.34*** (0.05)
Cohort shares (p -value)	0.00		0.00	0.00	0.00	0.00	0.00
Skill share (p -value)		0.03	0.07	0.11	0.21	0.06	0.08
First stage F -statistic					13.2	26.4	4.2
Hansen test (p -value)					—	0.18	0.16
Countries	120	120	120	120	120	120	120
Observations	1,098	1,098	1,098	1,053	1,098	1,098	1,098
R^2	0.87	0.86	0.87		0.87	0.87	0.87

Notes: This table reports results for demographic and human capital data by IIASA-VID (Lutz et al., 2007). The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w., capital p.w. and the working-age population are measured in logarithms. Column (4) corrects for the dynamic-panel bias using the Bruno (2005) estimator. The p -value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) or high-skill shares are jointly different from zero are reported. Instruments are shifted age cohorts in Column (5); the lagged share of high skills of the edge of the working-age population in Column (6); and a combination of both in Column (7). See Figure A3 for an illustration. First stage F -statistic reports the first stage Kleibergen-Paap rk Wald F -statistic. Hansen test p -values refer to the robust overidentifying restriction test. Standard errors are clustered at the country level. Asterisks indicate significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A15: Robustness: Population Scale Effects (in Absolute Values)

	Demography	Skills	Demography & Skills	Bias Correction	Demography Instrumented	Skills Instrumented	Both Instrumented
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Share < 20	-3.75*** (1.23)		-2.80** (1.22)	-2.75** (1.32)	-3.41*** (1.22)	-1.69 (1.22)	-2.16* (1.20)
Share 20–24	-2.41** (1.10)		-1.80 (1.09)	-1.78 (1.41)	-3.28** (1.37)	-1.09 (1.10)	-2.61* (1.35)
Share 25–29	-3.48** (1.42)		-2.94** (1.39)	-2.97* (1.66)	-2.60* (1.46)	-2.31* (1.32)	-2.03 (1.39)
Share 30–34	-3.04** (1.28)		-2.66** (1.25)	-2.64 (1.66)	-3.90*** (1.44)	-2.21* (1.21)	-3.51** (1.42)
Share 35–39	-4.01*** (1.45)		-3.65** (1.44)	-3.58** (1.74)	-2.96* (1.58)	-3.24** (1.40)	-2.46 (1.52)
Share 40–44	-1.54 (1.32)		-1.33 (1.29)	-1.33 (1.48)	-1.86 (1.41)	-1.08 (1.26)	-1.80 (1.40)
Share 45–49	-3.15** (1.43)		-3.00** (1.40)	-3.23 (2.15)	-3.88** (1.55)	-2.81** (1.36)	-3.75** (1.51)
Share 55–59	-4.71** (1.85)		-4.39** (1.81)	-4.79** (2.14)	-4.38** (1.83)	-4.01** (1.74)	-4.13** (1.77)
Share 60–64	-5.49*** (1.37)		-5.52*** (1.34)	-6.00*** (1.70)	-6.01*** (1.50)	-5.56*** (1.30)	-6.28*** (1.48)
Share 65+	-2.95* (1.59)		-3.12** (1.57)	-3.22** (1.64)	-4.11** (1.63)	-3.32** (1.59)	-4.06** (1.70)
Working-Age Population $(\hat{\beta}, se(\hat{\beta}) \times 100)$	0.04* (0.02)	0.05** (0.02)	0.06*** (0.02)	0.06*** (0.02)	0.05** (0.02)	0.07*** (0.02)	0.07*** (0.02)
Share high-skill		1.08*** (0.34)	1.28*** (0.41)	1.06*** (0.34)	0.99** (0.43)	2.77*** (0.79)	2.62*** (0.81)
Output p.w. ($t-1$)	0.51*** (0.04)	0.48*** (0.05)	0.49*** (0.05)	0.59*** (0.04)	0.48*** (0.05)	0.46*** (0.05)	0.46*** (0.05)
Capital p.w.	0.32*** (0.05)	0.33*** (0.04)	0.33*** (0.05)	0.29*** (0.02)	0.33*** (0.05)	0.34*** (0.05)	0.34*** (0.05)
Cohort shares (p -value)	0.01		0.01	0.00	0.01	0.00	0.00
Skill share (p -value)		0.00	0.00	0.00	0.02	0.00	0.00
First stage F -statistic					13.2	26.6	4.4
Hansen test (p -value)					—	0.31	0.37
Countries	120	120	120	120	120	120	120
Observations	1,098	1,098	1,098	1,053	1,098	1,098	1,098
R^2	0.87	0.86	0.87		0.87	0.86	0.86

Notes: This table reports results for demographic and human capital data by IIASA-VID (Lutz et al., 2007). The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w. are measured in logarithms. The working-age population is measured in millions. Column (4) corrects for the dynamic-panel bias using the Bruno (2005) estimator. The p -value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) or high-skill shares are jointly different from zero are reported. Instruments are shifted age cohorts in Column (5); the lagged share of high skills of the edge of the working-age population in Column (6); and a combination of both in Column (7). See Figure A3 for an illustration. First stage F -statistic reports the first stage Kleibergen-Paap rk Wald F -statistic. Hansen test p -values refer to the robust overidentifying restriction test. Standard errors are clustered at the country level. Asterisks indicate significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A16: Robustness: Controlling for Life Expectancy (Levels)

	Demography	Skills	Demography	Bias	Demography	Skills	Both
	(1)	(2)	& Skills	Correction	Instrumented	Instrumented	Instrumented
	(3)	(4)	(5)	(6)	(7)		
(a) IIASA-VID sample							
Share < 20	-3.70*** (1.23)		-2.71** (1.22)	-2.69** (1.30)	-3.49*** (1.22)	-1.29 (1.26)	-1.91 (1.23)
Share 20–24	-2.36** (1.12)		-1.72 (1.11)	-1.83 (1.39)	-3.22** (1.39)	-0.80 (1.13)	-2.33* (1.39)
Share 25–29	-3.51** (1.45)		-2.95** (1.41)	-3.06* (1.64)	-2.65* (1.49)	-2.13 (1.35)	-1.82 (1.42)
Share 30–34	-2.52** (1.25)		-2.11* (1.22)	-2.16 (1.63)	-3.61** (1.46)	-1.52 (1.19)	-3.21** (1.43)
Share 35–39	-4.59*** (1.63)		-4.30*** (1.60)	-4.28** (1.72)	-3.29* (1.77)	-3.88** (1.55)	-2.61 (1.68)
Share 40–44	-1.17 (1.31)		-0.93 (1.29)	-1.03 (1.46)	-1.64 (1.41)	-0.59 (1.29)	-1.55 (1.43)
Share 45–49	-2.95** (1.43)		-2.80** (1.40)	-3.07 (2.13)	-3.77** (1.52)	-2.59* (1.37)	-3.58** (1.48)
Share 55–59	-4.45** (1.87)		-4.11** (1.84)	-4.57** (2.12)	-4.16** (1.82)	-3.62** (1.78)	-3.79** (1.77)
Share 60–64	-5.37*** (1.35)		-5.41*** (1.32)	-5.88*** (1.67)	-5.99*** (1.48)	-5.47*** (1.27)	-6.32*** (1.46)
Share 65+	-2.97* (1.77)		-3.04* (1.74)	-3.18* (1.62)	-4.22** (1.70)	-3.14* (1.79)	-4.11** (1.81)
Life expectancy	0.00 (0.00)	0.01 (0.00)	0.00 (0.00)	0.005** (0.002)	0.00 (0.00)	0.01 (0.00)	0.01 (0.00)
Share high-skill		1.14*** (0.35)	1.32*** (0.42)	1.13*** (0.33)	0.98** (0.44)	3.21*** (0.86)	3.04*** (0.89)
Cohort shares (<i>p</i> -value)	0.01		0.01	0.00	0.01	0.00	0.00
Skill share (<i>p</i> -value)		0.00	0.00	0.00	0.03	0.00	0.00
First stage <i>F</i> -statistic					12.2	30.4	5.1
Hansen test (<i>p</i> -value)					—	0.47	0.57
(b) Barro-Lee sample							
Share < 20	-3.21*** (1.21)		-2.61** (1.24)	-2.35 (1.46)	-2.41 (1.52)	-2.24* (1.20)	-1.84 (1.44)
Share 20–24	-1.12 (1.14)		-0.66 (1.11)	-0.90 (1.61)	-1.24 (1.61)	-0.38 (1.07)	-0.99 (1.56)
Share 25–29	-3.10** (1.42)		-2.78* (1.44)	-2.87* (1.62)	-2.13 (1.81)	-2.57* (1.40)	-1.86 (1.76)
Share 30–34	-1.78 (1.29)		-1.62 (1.27)	-1.48 (1.77)	-0.88 (1.84)	-1.52 (1.24)	-0.52 (1.83)
Share 35–39	-2.87* (1.53)		-2.54* (1.51)	-2.42 (1.62)	-2.85 (2.23)	-2.34 (1.47)	-2.59 (2.16)
Share 40–44	-1.34 (1.39)		-1.07 (1.36)	-1.28 (1.72)	-0.08 (1.69)	-0.90 (1.31)	0.12 (1.68)
Share 45–49	-1.15 (1.51)		-1.12 (1.49)	-1.08 (2.25)	-1.37 (2.13)	-1.11 (1.47)	-1.15 (2.09)
Share 55–59	-2.87 (1.83)		-2.49 (1.82)	-3.00 (2.37)	-1.91 (2.35)	-2.26 (1.76)	-1.62 (2.30)
Share 60–64	-4.53*** (1.35)		-4.50*** (1.33)	-5.08*** (1.71)	-4.52*** (1.61)	-4.49*** (1.30)	-4.57*** (1.61)
Share 65+	-0.74 (1.72)		-0.75 (1.67)	-0.77 (1.89)	-1.65 (2.12)	-0.76 (1.64)	-1.44 (2.09)
Life expectancy	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)
Share high-skill		0.86*** (0.23)	0.74*** (0.26)	0.60*** (0.20)	0.69*** (0.26)	1.20*** (0.44)	1.17*** (0.44)
Cohort shares (<i>p</i> -value)	0.00		0.01	0.01	0.00	0.01	0.00
Skill share (<i>p</i> -value)		0.00	0.00	0.00	0.01	0.01	0.01
First stage <i>F</i> -statistic					15.5	28.1	4.9
Hansen test (<i>p</i> -value)					—	0.15	0.15

Notes: Panel (a) reports results for demographic and human capital data by IIASA-VID (Lutz et al., 2007), Panel (b) for data from Barro and Lee (2013). The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w. are measured in logarithms (coefficients unreported). Column (4) corrects for the dynamic-panel bias using the Bruno (2005) estimator. The *p*-value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) or high-skill shares are jointly different from zero are reported. Instruments are shifted age cohorts in Column (5); the lagged share of high skills of the edge of the working-age population in Column (6); and a combination of both in Column (7). See Figure A3 for an illustration. First stage *F*-statistic reports the first stage Kleibergen-Paap rk Wald *F*-statistic. Hansen test *p*-values refer to the robust overidentifying restriction test. Standard errors are clustered at the country level. Asterisks indicate significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A17: Robustness: Average Years of Schooling (Levels)

	Demography	Skills	Demography	Bias	Demography	Skills	Both
	(1)	(2)	& Skills	Correction	Instrumented	Instrumented	Instrumented
	(3)	(4)	(5)	(6)	(7)		
Share < 20	-3.64*** (1.17)		-3.66*** (1.18)	-3.23** (1.46)	-3.70** (1.55)	-3.83*** (1.16)	-3.97*** (1.53)
Share 20–24	-1.55 (1.14)		-1.54 (1.14)	-1.53 (1.50)	-2.04 (1.65)	-1.47 (1.11)	-1.83 (1.68)
Share 25–29	-3.61** (1.41)		-3.62** (1.41)	-3.52* (1.83)	-3.15* (1.89)	-3.65*** (1.36)	-3.36* (1.92)
Share 30–34	-2.39* (1.29)		-2.37* (1.28)	-2.05 (1.61)	-2.30 (1.77)	-2.28* (1.26)	-2.24 (1.69)
Share 35–39	-2.53* (1.39)		-2.54* (1.39)	-2.21 (1.62)	-3.01 (2.03)	-2.55* (1.37)	-2.86 (2.03)
Share 40–44	-2.24 (1.44)		-2.24 (1.44)	-2.29 (1.77)	-1.25 (1.79)	-2.23 (1.42)	-1.44 (1.81)
Share 45–49	-1.83 (1.47)		-1.81 (1.47)	-1.70 (1.91)	-2.60 (2.20)	-1.70 (1.48)	-2.53 (2.20)
Share 55–59	-3.75** (1.85)		-3.78** (1.85)	-4.11* (2.31)	-3.05 (2.42)	-3.91** (1.82)	-3.39 (2.43)
Share 60–64	-4.95*** (1.40)		-4.96*** (1.40)	-5.53*** (1.72)	-5.43*** (1.70)	-5.07*** (1.36)	-5.69*** (1.68)
Share 65+	-1.44 (1.65)		-1.40 (1.63)	-1.39 (1.77)	-2.47 (2.10)	-1.20 (1.63)	-1.95 (2.07)
Years of schooling	0.00 (0.01)		-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.04** (0.02)	-0.04** (0.02)
Output p.w. ($t-1$)	0.53*** (0.05)	0.54*** (0.05)	0.53*** (0.05)	0.66*** (0.03)	0.53*** (0.05)	0.53*** (0.05)	0.53*** (0.05)
Capital p.w.	0.27*** (0.04)	0.27*** (0.04)	0.28*** (0.04)	0.22*** (0.02)	0.28*** (0.04)	0.28*** (0.04)	0.28*** (0.04)
Cohort shares (p -value)	0.00		0.00	0.01	0.00	0.00	0.00
Skill share (p -value)		1.00	0.68	0.32	0.67	0.04	0.04
First stage F -statistic					12.3	103.5	18.9
Hansen test (p -value)					—	0.00	0.00
Countries	139	139	139	139	138	139	138
Observations	1,259	1,259	1,259	1,211	1,248	1,259	1,248
R^2	0.84	0.84	0.84		0.84	0.84	0.83

Notes: This table reports results for demographic and human capital data by Barro and Lee (2013). Human capital is proxied by average years of schooling. The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w. are measured in logarithms. Column (4) corrects for the dynamic-panel bias using the Bruno (2005) estimator. The p -value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) or high-skill shares are jointly different from zero are reported. Instruments are shifted age cohorts in Column (5); the lagged share of high skills of the edge of the working-age population in Column (6); and a combination of both in Column (7). See Figure A3 for an illustration. First stage F -statistic reports the first stage Kleibergen-Paap rk Wald F -statistic. Hansen test p -values refer to the robust overidentifying restriction test. Standard errors are clustered at the country level. Asterisks indicate significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A18: Heterogeneity: Sample Split OECD and Non-OECD Countries (Levels)

	Demography	Skills	Demography	Bias	Demography	Skills	Both
	(1)	(2)	& Skills	Correction	Instrumented	Instrumented	Instrumented
	(3)	(4)	(5)	(6)	(7)		
(a) OECD Countries							
Share < 20	0.35 (0.99)	0.60 (1.07)	0.44 (1.23)	0.72 (1.05)	1.28 (1.09)	1.43 (1.16)	
Share 20–24	-0.98 (0.89)	-0.89 (0.89)	-0.66 (1.26)	-1.89* (0.97)	-0.63 (0.82)	-1.73* (0.98)	
Share 25–29	-0.40 (1.22)	-0.26 (1.24)	-0.15 (1.48)	1.05 (1.24)	0.12 (1.21)	1.16 (1.29)	
Share 30–34	-0.41 (1.12)	-0.32 (1.12)	-0.04 (1.29)	-1.18 (1.32)	-0.07 (1.03)	-1.02 (1.26)	
Share 35–39	0.49 (0.97)	0.62 (0.98)	0.87 (1.58)	1.01 (0.98)	1.00 (0.94)	1.25 (1.05)	
Share 40–44	-0.77 (1.10)	-0.74 (1.10)	-0.70 (1.14)	-0.55 (1.01)	-0.66 (1.08)	-0.62 (1.02)	
Share 45–49	-0.54 (1.12)	-0.52 (1.13)	-0.47 (1.72)	-0.78 (0.99)	-0.47 (1.10)	-0.90 (1.01)	
Share 55–59	0.02 (1.59)	0.04 (1.62)	-0.04 (1.62)	-0.00 (1.47)	0.09 (1.59)	-0.08 (1.52)	
Share 60–64	-1.57 (1.14)	-1.65 (1.12)	-1.75 (1.43)	-1.79 (1.11)	-1.87* (1.02)	-2.18** (1.06)	
Share 65+	-1.76 (1.29)	-1.71 (1.34)	-1.87 (1.31)	-2.22 (1.41)	-1.60 (1.45)	-2.14 (1.61)	
Share high-skill	0.21 (0.34)	0.41 (0.32)	0.51* (0.26)	0.42 (0.28)	1.51** (0.61)	1.60*** (0.59)	
Cohort shares (<i>p</i> -value)	0.45	0.24	0.06	0.01	0.02	0.00	
Skill share (<i>p</i> -value)	0.54	0.21	0.05	0.14	0.01	0.01	
First stage <i>F</i> -statistic				22.8	9.9	1.8	
Hansen test (<i>p</i> -value)				—	0.33	0.31	
Countries	32	32	32	32	32	32	32
Observations	341	341	341	318	341	341	341
(b) Non-OECD countries							
Share < 20	-5.44*** (1.85)	-4.88*** (1.84)	-5.15** (2.59)	-6.88*** (2.07)	-3.03* (1.78)	-4.47** (1.89)	
Share 20–24	-3.14* (1.77)	-2.85 (1.77)	-3.24 (2.61)	-5.58** (2.40)	-1.88 (1.76)	-4.42* (2.27)	
Share 25–29	-4.35* (2.23)	-4.11* (2.18)	-4.57 (2.83)	-5.80** (2.54)	-3.29* (1.99)	-4.54** (2.24)	
Share 30–34	-4.48** (1.88)	-4.30** (1.85)	-4.70 (2.86)	-6.55** (2.67)	-3.67** (1.78)	-6.21** (2.59)	
Share 35–39	-7.06*** (2.48)	-6.89*** (2.47)	-7.04** (2.93)	-6.87** (3.19)	-6.30*** (2.32)	-5.29* (3.01)	
Share 40–44	-1.71 (2.46)	-1.66 (2.42)	-1.86 (3.06)	-3.80 (3.06)	-1.48 (2.26)	-3.88 (2.98)	
Share 45–49	-4.12 (2.55)	-4.18 (2.53)	-5.02 (3.72)	-8.14** (3.54)	-4.37* (2.43)	-7.74** (3.25)	
Share 55–59	-7.70*** (2.83)	-7.56*** (2.78)	-8.24* (4.30)	-9.02*** (3.16)	-7.11*** (2.61)	-8.37*** (3.02)	
Share 60–64	-7.66*** (2.34)	-7.67*** (2.27)	-8.96*** (3.24)	-9.60*** (2.92)	-7.73*** (2.04)	-10.11*** (2.67)	
Share 65+	-4.47 (2.81)	-4.41 (2.76)	-4.92 (3.21)	-6.23* (3.21)	-4.21 (2.63)	-5.95* (3.12)	
Share high-skill	0.96* (0.50)	0.92 (0.68)	0.60 (0.61)	0.50 (0.73)	4.03*** (1.45)	3.98*** (1.49)	
Cohort shares (<i>p</i> -value)	0.01	0.01	0.01	0.00	0.00	0.03	
Skill share (<i>p</i> -value)	0.06	0.18	0.33	0.49	0.01	0.01	
First stage <i>F</i> -statistic				6.3	28.2	4.6	
Hansen test (<i>p</i> -value)				—	0.83	0.90	
Countries	88	88	88	88	88	88	88
Observations	757	757	757	735	757	757	757

Notes: This table reports results for demographic and human capital data by IIASA-VID (Lutz et al., 2007). Panel (a) reports results for OECD countries, Panel (b) for Non-OECD countries. The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w. are measured in logarithms (coefficients unreported). Column (4) corrects for the dynamic-panel bias using the Bruno (2005) estimator. The *p*-value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) or high-skill shares are jointly different from zero are reported. Instruments are shifted age cohorts in Column (5); the lagged shares of high skills of cohorts at the edge of the working-age population in Column (6); and a combination of both in Column (7). See Figure A3 for an illustration. First stage *F*-statistic reports the first stage Kleibergen-Paap rk Wald *F*-statistic. Hansen test *p*-values refer to the robust overidentifying restriction test. Standard errors are clustered at the country level. Asterisks indicate significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A19: Heterogeneity: Sample Split Before and After 1990 (Levels)

	Demography & Skills		Bias Correction		Skills	
					Instrumented	
	-1990 (1)	1990+ (2)	-1990 (3)	1990+ (4)	-1990 (5)	1990+ (6)
Share < 20	2.49 (1.51)	-5.21*** (1.68)	2.83 (1.81)	-4.40** (1.85)	2.50* (1.50)	-1.38 (2.19)
Share 20–24	1.64 (1.30)	-3.60** (1.58)	1.60 (1.67)	-2.92 (2.18)	1.63 (1.27)	-0.27 (1.89)
Share 25–29	0.76 (1.82)	-5.05*** (1.79)	0.88 (2.20)	-4.65* (2.55)	0.76 (1.78)	-2.82 (1.82)
Share 30–34	1.30 (1.68)	-4.72*** (1.64)	1.59 (1.83)	-4.40** (2.04)	1.29 (1.69)	-1.72 (2.16)
Share 35–39	0.66 (1.60)	-5.31*** (1.74)	1.44 (2.15)	-5.00* (2.63)	0.65 (1.61)	-3.89** (1.76)
Share 40–44	2.83** (1.37)	-5.45*** (1.76)	3.20 (2.15)	-5.47* (2.87)	2.83** (1.34)	-1.95 (2.11)
Share 45–49	1.36 (1.52)	-5.56*** (1.87)	0.52 (2.72)	-4.85 (3.24)	1.38 (1.49)	-4.61** (1.99)
Share 55–59	1.49 (1.85)	-5.60*** (2.10)	1.68 (2.74)	-5.80** (2.82)	1.49 (1.81)	-4.18** (2.02)
Share 60–64	-1.56 (1.62)	-7.34*** (1.89)	-1.56 (2.43)	-8.29*** (2.49)	-1.55 (1.57)	-8.21*** (1.84)
Share 65+	1.66 (1.67)	-7.56*** (2.12)	3.00 (2.74)	-7.53** (2.96)	1.65 (1.60)	-8.40*** (2.54)
Share high-skill	1.10 (1.01)	0.56 (0.81)	0.28 (1.04)	0.42 (0.96)	1.17 (2.03)	6.36** (2.53)
Output p.w. ($t-1$)	0.54*** (0.10)	0.23*** (0.06)	0.80*** (0.08)	0.42*** (0.08)	0.54*** (0.10)	0.20*** (0.06)
Capital p.w.	0.28*** (0.07)	0.46*** (0.06)	0.19*** (0.05)	0.41*** (0.04)	0.28*** (0.07)	0.46*** (0.06)
Cohort shares (p -value)	0.15	0.02	0.32	0.00	0.27	0.00
Skill share (p -value)	0.28	0.49	0.79	0.66	0.56	0.01
First stage F -statistic					19.0	14.3
Hansen test (p -value)					0.29	0.52
Countries	103	120	103	120	85	120
Observations	516	582	471	479	498	582
R^2	0.82	0.74			0.82	0.70

Notes: This table reports results for demographic and human capital data by IIASA-VID (Lutz et al., 2007). The sample is split in periods before 1990 (1955–1985) and after 1990 (1990–2010). The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w. are measured in logarithms. Columns (3) and (4) correct for the dynamic-panel bias using the Bruno (2005) estimator. Instruments are the lagged shares of high skills of cohorts at the edge of the working-age population in Columns (5) and (6); see Panel (c) of Figure A3 for an illustration. The p -value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) and the first stage Kleibergen-Paap rk Wald F -statistic are reported. Hansen test p -values refer to the robust overidentifying restriction test. Standard errors are clustered at the country level. Asterisks indicate significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A20: Heterogeneity: Sample Split Before and After 1990 (Levels, Barro-Lee Data)

	Demography & Skills		Bias Correction		Skills	
					Instrumented	
	-1990 (1)	1990+ (2)	-1990 (3)	1990+ (4)	-1990 (5)	1990+ (6)
Share < 20	0.05 (1.38)	-3.78* (2.15)	0.74 (0.74)	-2.74 (1.82)	0.05 (1.35)	-2.56 (2.20)
Share 20–24	1.76 (1.31)	-2.24 (1.78)	1.01 (1.99)	-1.23 (1.82)	1.77 (1.30)	-0.74 (1.89)
Share 25–29	-1.84 (1.61)	-4.49** (2.03)	-1.52 (2.50)	-3.68* (2.02)	-1.83 (1.57)	-4.05* (2.08)
Share 30–34	-0.49 (1.54)	-2.52 (2.21)	-0.14 (1.90)	-1.75 (2.46)	-0.47 (1.56)	-1.40 (2.28)
Share 35–39	-0.13 (1.27)	-1.95 (2.17)	0.13 (2.44)	-1.43 (2.40)	-0.12 (1.24)	-1.14 (2.19)
Share 40–44	1.01 (1.33)	-5.42** (2.19)	1.57 (2.51)	-5.32** (2.53)	1.00 (1.30)	-4.26** (2.17)
Share 45–49	-0.14 (1.34)	-2.58 (2.72)	-0.45 (2.69)	-0.99 (3.09)	-0.14 (1.32)	-2.33 (2.71)
Share 55–59	1.61 (1.54)	-4.39 (2.73)	1.34 (2.98)	-4.22 (2.67)	1.61 (1.51)	-3.56 (2.78)
Share 60–64	-1.12 (1.60)	-7.16*** (1.81)	-1.76 (2.79)	-7.98*** (2.28)	-1.10 (1.56)	-6.92*** (1.81)
Share 65+	0.54 (1.89)	-3.98 (2.54)	1.76 (3.19)	-3.68 (3.44)	0.56 (1.83)	-3.38 (2.68)
Share high-skill	0.18 (0.38)	0.69 (0.55)	-0.01 (0.50)	0.59 (0.59)	0.13 (0.51)	2.11** (1.05)
Output p.w. ($t-1$)	0.54*** (0.08)	0.23*** (0.06)	0.84*** (0.05)	0.48*** (0.07)	0.54*** (0.08)	0.21*** (0.05)
Capital p.w.	0.31*** (0.06)	0.35*** (0.05)	0.18*** (0.04)	0.29*** (0.04)	0.31*** (0.06)	0.36*** (0.05)
Cohort shares (p -value)	0.36	0.01	0.36	0.00	0.36	0.01
Skill share (p -value)	0.64	0.21	0.99	0.32	0.80	0.04
First stage F -statistic					8.3	15.6
Hansen test (p -value)					0.31	0.18
Countries	122	139	122	139	97	139
Observations	582	677	534	555	557	677
R^2	0.81	0.67			0.81	0.66

Notes: This table reports results for demographic and human capital data by Barro and Lee (2013). The sample is split in periods before 1990 (1955–1985) and after 1990 (1990–2010). The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w. are measured in logarithms. Columns (3) and (4) correct for the dynamic-panel bias using the Bruno (2005) estimator. Instruments are the lagged shares of high skills of cohorts at the edge of the working-age population in Columns (5) and (6); see Panel (c) of Figure A3 for an illustration. The p -value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) and the first stage Kleibergen-Paap rk Wald F -statistic are reported. Hansen test p -values refer to the robust overidentifying restriction test. Standard errors are clustered at the country level. Asterisks indicate significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A21: Robustness: Old Versus Young Populations (Levels)

	Demography	Skills	Demography	Bias	Demography	Skills	Both
	(1)	(2)	& Skills (3)	Correction (4)	Instrumented (5)	Instrumented (6)	Instrumented (7)
(a) Old populations (above median of the young-age dependency ratio)							
Share < 20	-4.26*** (1.54)		-3.92** (1.55)	-4.12** (1.87)	-3.35** (1.38)	-3.57** (1.60)	-2.86* (1.47)
Share 20–24	-1.93 (1.27)		-1.76 (1.28)	-1.97 (1.86)	-3.62** (1.47)	-1.58 (1.27)	-3.51** (1.51)
Share 25–29	-4.79** (1.82)		-4.64** (1.79)	-5.08** (2.26)	-2.24 (1.53)	-4.48*** (1.74)	-2.03 (1.54)
Share 30–34	-3.32** (1.32)		-3.22** (1.31)	-3.23* (1.86)	-5.28*** (1.72)	-3.12** (1.28)	-5.18*** (1.72)
Share 35–39	-4.51** (1.81)		-4.39** (1.80)	-4.54** (2.12)	-2.27 (1.78)	-4.27** (1.75)	-2.11 (1.75)
Share 40–44	-3.27** (1.32)		-3.23** (1.31)	-3.59** (1.70)	-3.85*** (1.28)	-3.19** (1.27)	-3.86*** (1.29)
Share 45–49	-5.28*** (1.80)		-5.25*** (1.80)	-5.65** (2.68)	-4.43*** (1.65)	5.22*** (1.74)	-4.43*** (1.64)
Share 55–59	-5.47** (2.10)		-5.38** (2.09)	-6.19** (2.70)	-5.38*** (1.92)	-5.29*** (2.02)	-5.32*** (1.91)
Share 60–64	-6.22*** (1.59)		-6.29*** (1.57)	-7.11*** (1.72)	-6.32*** (1.67)	-6.37*** (1.51)	-6.54*** (1.68)
Share 65+	-6.13*** (1.54)		-6.13*** (1.54)	-6.29*** (2.09)	-5.90*** (1.54)	-6.13*** (1.52)	-5.95*** (1.56)
Share high-skill		0.15 (0.38)	0.54 (0.42)	0.47 (0.40)	0.41 (0.42)	1.10 (0.95)	1.13 (0.92)
Cohort shares (<i>p</i> -value)	0.02		0.01	0.00	0.00	0.00	0.00
Skill share (<i>p</i> -value)		0.69	0.21	0.24	0.33	0.25	0.22
First stage <i>F</i> -statistic					6.5	16.2	2.6
Hansen test (<i>p</i> -value)					—	0.24	0.18
Observations	549	549	549	525	543	543	543
<i>R</i> ²	0.93	0.92	0.93		0.93	0.93	0.93
(b) Young populations (below median of the young-age dependency ratio)							
Share < 20	3.42 (3.11)		3.67 (3.18)	2.88 (4.09)	-0.49 (5.27)	4.45 (3.01)	0.65 (5.35)
Share 20–24	3.42 (3.09)		3.46 (3.09)	2.80 (4.28)	-1.90 (5.33)	3.58 (3.02)	-1.47 (5.41)
Share 25–29	5.23 (3.26)		5.24 (3.25)	4.24 (4.16)	1.70 (6.07)	5.26* (3.13)	1.88 (6.14)
Share 30–34	0.50 (3.94)		0.53 (3.96)	-0.20 (4.98)	-2.22 (5.29)	0.63 (3.93)	-1.88 (5.41)
Share 35–39	4.45 (2.84)		4.45 (2.84)	4.25 (3.93)	1.23 (6.31)	4.46 (2.80)	1.41 (6.41)
Share 40–44	7.66* (3.90)		7.60* (3.89)	6.65 (4.92)	4.25 (6.70)	7.39* (3.77)	3.99 (6.71)
Share 45–49	3.66 (3.94)		3.55 (3.95)	2.95 (6.77)	-6.74 (7.94)	3.22 (3.91)	-6.71 (8.04)
Share 55–59	-0.84 (5.22)		-0.67 (5.19)	-1.37 (6.24)	-7.54 (10.07)	-0.17 (4.95)	-7.34 (10.20)
Share 60–64	1.76 (6.15)		2.04 (6.13)	1.21 (9.59)	-2.17 (11.31)	2.87 (5.81)	-1.75 (11.26)
Share 65+	9.94 (6.26)		9.91 (6.22)	9.45 (6.76)	14.80 (13.30)	9.84* (5.97)	17.70 (13.16)
Share high-skill		0.88 (0.92)	0.77 (1.07)	0.48 (1.02)	0.63 (1.11)	3.09** (1.44)	3.05* (1.61)
Cohort shares (<i>p</i> -value)	0.07		0.07	0.23	0.66	0.11	0.66
Skill share (<i>p</i> -value)		0.34	0.47	0.64	0.57	0.03	0.06
First stage <i>F</i> -statistic					0.9	32.2	0.9
Hansen test (<i>p</i> -value)					—	0.50	0.53
Observations	549	549	549	528	545	545	545
<i>R</i> ²	0.70	0.69	0.70		0.69	0.70	0.69

Notes: This table reports results for demographic and human capital data by IIASA-VID (Lutz et al., 2007). The sample has been split with respect to the young-age dependency ratio. Panel (a) reports results for observations for which the young-age dependency ratio is above the median, Panel (b) for observations below the median. The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w. are measured in logarithms (coefficients unreported). Column (4) corrects for the dynamic-panel bias using the Bruno (2005) estimator. The *p*-value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) or high-skill shares are jointly different from zero are reported. Instruments are shifted age cohorts in Column (5); the lagged share of high skills of the edge of the working-age population in Column (6); and a combination of both in Column (7). See Figure A3 for an illustration. First stage *F*-statistic reports the first stage Kleibergen-Paap rk Wald *F*-statistic. Hansen test *p*-values refer to the robust overidentifying restriction test. Standard errors are clustered at the country level. Asterisks indicate significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table A22: Robustness: Labor Force Shares

	Demography	Skills	Demography & Skills	Bias Correction	Demography Instrumented	Skills Instrumented	Both Instrumented
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Labor Force Share < 20	-4.96*** (1.34)		-4.91*** (1.37)	-4.53*** (1.44)	-5.64*** (1.74)	-3.14* (1.63)	-1.85 (2.39)
Labor Force Share 20–24	-4.16*** (1.27)		-4.07*** (1.32)	-3.76*** (1.43)	-6.00*** (1.41)	-0.85 (1.77)	-3.96** (1.66)
Labor Force Share 25–29	-4.03*** (1.34)		-3.96*** (1.38)	-4.25** (1.70)	-4.67*** (1.60)	-1.45 (1.65)	-2.10 (2.10)
Labor Force Share 30–34	-4.28*** (1.51)		-4.21*** (1.52)	-4.05** (1.69)	-7.13*** (1.83)	-1.79 (1.81)	-5.36** (2.31)
Labor Force Share 35–39	-5.54*** (1.49)		-5.48*** (1.48)	-5.49*** (1.89)	-5.68*** (1.90)	-3.50** (1.65)	-4.43** (2.15)
Labor Force Share 40–44	-4.25*** (1.38)		-4.22*** (1.39)	-4.30** (1.67)	-5.63*** (1.64)	-3.01** (1.42)	-5.01*** (1.93)
Labor Force Share 45–49	-4.60** (1.77)		-4.57** (1.77)	-4.62* (2.40)	-6.59*** (1.81)	-3.70* (1.94)	-5.49** (2.14)
Labor Force Share 55–59	-5.78*** (1.88)		-5.77*** (1.89)	-5.79** (2.52)	-6.27*** (1.92)	-5.35*** (2.01)	-6.78*** (2.11)
Labor Force Share 60–64	-6.93*** (2.43)		-6.92*** (2.44)	-7.68*** (2.24)	-9.28*** (2.71)	-6.71** (3.04)	-10.16*** (3.41)
Labor Force Share 65+	-2.00 (2.12)		-1.98 (2.13)	-1.28 (1.98)	-6.80 (4.74)	-1.57 (3.16)	-11.76* (6.69)
Share high-skill		0.85** (0.33)	0.19 (0.66)	-0.29 (0.59)	0.08 (0.69)	6.99*** (2.54)	6.29** (2.93)
Output p.w. ($t-1$)	0.25*** (0.05)	0.50*** (0.05)	0.25*** (0.05)	0.41*** (0.04)	0.23*** (0.06)	0.18*** (0.06)	0.19*** (0.07)
Capital p.w.	0.46*** (0.06)	0.33*** (0.04)	0.46*** (0.06)	0.42*** (0.03)	0.47*** (0.06)	0.46*** (0.06)	0.48*** (0.06)
Cohort shares (p -value)	0.03		0.04	0.00	0.00	0.12	0.02
Skill share (p -value)		0.01	0.77	0.62	0.91	0.01	0.03
First stage F -statistic					2.8	10.9	1.1
Hansen test (p -value)					—	0.60	0.73
Countries	120	120	120	120	120	120	120
Observations	645	1,098	645	645	645	645	645
R^2	0.76	0.86	0.76		0.75	0.68	0.65

Notes: This table reports results for demographic data by International Labour Organization (2011) and human capital data by IIASA-VID (Lutz et al., 2007). The dependent variable is log output per worker. All regressions include country-specific fixed and time effects. Lagged output p.w. and capital p.w., measured in logarithms, are included as controls in all specifications. Column (4) corrects for the dynamic-panel bias using the Bruno (2005) estimator. The p -value for a Wald test whether coefficients of workforce shares (proxied by the working-age population) or high-skill shares are jointly different from zero are reported. Instruments are shifted age cohorts in Column (5); the lagged shares of high skills of cohorts at the edge of the working-age population in Column (6); and a combination of both in Column (7). See Figure A3 for an illustration. First stage F -statistic reports the first stage Kleibergen-Paap rk Wald F -statistic. Hansen test p -values refer to the robust overidentifying restriction test. Standard errors are clustered at the country level. Asterisks indicate significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

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