

TABLE 10.3
Growth accounting for a sample of 19 countries

	(1) Growth rate of GDP	(2) Contribution from capital	(3) Contribution from labor	(4) TFP growth rate
PANEL A: OECD Countries, 1947-1973				
Canada ($\alpha = 0.44$)	0.0517	0.0254 (49.2%)	0.0088 (17.0%)	0.0175 (33.9%)
France ^a ($\alpha = 0.40$)	0.0542	0.0225 (41.5%)	0.0021 (3.9%)	0.0296 (54.5%)
Germany ^a ($\alpha = 0.39$)	0.0661	0.0269 (40.6%)	0.0018 (2.8%)	0.0374 (56.6%)
Italy ^b ($\alpha = 0.39$)	0.0527	0.0180 (34.0%)	0.0011 (2.0%)	0.0337 (63.5%)
Japan ^b ($\alpha = 0.39$)	0.0951	0.0328 (34.5%)	0.0221 (23.3%)	0.0402 (42.3%)
Netherlands ^c ($\alpha = 0.45$)	0.0536	0.0247 (46.0%)	0.0042 (7.8%)	0.0248 (46.2%)
U.K. ^d ($\alpha = 0.38$)	0.0373	0.0176 (47.2%)	0.0003 (0.9%)	0.0193 (51.9%)
U.S. ($\alpha = 0.40$)	0.0402	0.0171 (42.7%)	0.0095 (23.7%)	0.0135 (33.6%)
PANEL B: G-7 Countries, 1960-1990				
Canada ($\alpha = 0.45$)	0.0410	0.0229 (55.9%)	0.0135 (32.8%)	0.0046 (11.3%)
France ($\alpha = 0.42$)	0.0350	0.0203 (58.1%)	0.0002 (0.5%)	0.0145 (41.4%)
Germany ($\alpha = 0.40$)	0.0320	0.0188 (58.7%)	-0.0025 (-8.1%)	0.0158 (49.4%)
Italy ($\alpha = 0.38$)	0.0410	0.0202 (49.3%)	0.0011 (2.8%)	0.0197 (47.9%)
Japan ($\alpha = 0.42$)	0.0681	0.0387 (56.9%)	0.0097 (14.3%)	0.0196 (28.8%)
U.K. ($\alpha = 0.39$)	0.0249	0.0131 (52.3%)	-0.0010 (-4.2%)	0.0130 (51.9%)
U.S. ($\alpha = 0.41$)	0.0310	0.0140 (45.2%)	0.0129 (41.5%)	0.0041 (13.2%)

(continued)

TABLE 10.8 (continued)

	(1) Growth rate of GDP	(2) Contribution from capital	(3) Contribution from labor	(4) TFP growth rate
PANEL C: Latin American Countries, 1940-1980				
Argentina ($\alpha = 0.54$)	0.0360	0.0155 (43.1%)	0.0095 (26.4%)	0.0110 (30.5%)
Brazil ($\alpha = 0.45$)	0.0640	0.0325 (50.8%)	0.0130 (20.3%)	0.0185 (28.9%)
Chile ($\alpha = 0.52$)	0.0380	0.0130 (34.2%)	0.0100 (26.3%)	0.0150 (39.5%)
Colombia ($\alpha = 0.63$)	0.0480	0.0205 (42.7%)	0.0155 (32.3%)	0.0120 (25.0%)
Mexico ($\alpha = 0.69$)	0.0630	0.0255 (40.5%)	0.0145 (23.0%)	0.0230 (36.5%)
Peru ($\alpha = 0.66$)	0.0420	0.0285 (67.9%)	0.0135 (32.1%)	0.0000 (0.0%)
Venezuela ($\alpha = 0.55$)	0.0520	0.0295 (56.7%)	0.0175 (33.7%)	0.0050 (9.6%)
PANEL D: East Asian Countries, 1966-1990				
Hong Kong ($\alpha = 0.37$)	0.0730	0.0309 (42.3%)	0.0200 (27.6%)	0.0220 (30.1%)
Singapore ($\alpha = 0.53$)	0.0850	0.0620 (73.1%)	0.0268 (31.6%)	-0.0040 (-4.7%)
South Korea ($\alpha = 0.32$)	0.1032	0.0477 (46.2%)	0.0435 (42.2%)	0.0120 (11.6%)
Taiwan ($\alpha = 0.29$)	0.0910	0.0368 (40.5%)	0.0362 (39.8%)	0.0180 (19.8%)

Column (1) reports the annualized growth rate of real GDP.

Column (2) is the product of the capital share, α , and the growth rate of quality-adjusted capital input. The number in parentheses is the percentage of the GDP growth rate that is explained by the growth of capital input. The average value of the capital share is reported in parentheses beneath the name of the country.

Column (3) is the product of the labor share, $1 - \alpha$, and the growth rate of quality-adjusted labor input. The number in parentheses is the percentage of the GDP growth rate that is explained by the growth of labor input.

Column (4) shows the growth rate of total factor productivity (TFP). The number in parentheses is the percentage of the GDP growth rate that is explained by TFP growth.

^a1950-1973

^b1952-1973

^c1951-1973

^d1955-1973

Source: Panel A: Christenson, Cummings, and Jorgenson (1980); panel B: Dougherty (1991); panel C: Elias (1990); panel D: Young (1994).

Appendix Table 1
AVERAGE GROWTH OF OUTPUT AND INPUTS BY COUNTRY

COUNTRY	FIRST YEAR	OUTPUT	CAPITAL	GROWTH RATE PER WORKER		
				HUMAN CAPITAL	TFP	TFP RELATIVE TO OUTPUT
<i>Western Countries</i>						
Australia	1861	1.66	2.06	0.94	0.35	0.21
Austria	1880	2.07	2.57	1.02	0.54	0.26
Belgium	1846	1.92	2.38	0.88	0.54	0.28
Canada	1871	1.58	2.13	1.14	0.12	0.07
Denmark	1871	2.20	2.24	1.10	0.72	0.33
Finland	1850	1.48	1.96	1.00	0.17	0.11
France	1850	1.61	2.04	0.91	0.33	0.20
Germany	1880	2.59	3.24	1.11	0.78	0.30
Ireland	1926	3.62	3.98	1.87	1.06	0.29
Netherlands	1849	1.74	2.17	0.86	0.44	0.25
New Zealand	1911	2.03	2.72	1.06	0.42	0.21
Norway	1855	2.05	2.68	0.89	0.57	0.28
Sweden	1860	1.59	2.46	0.83	0.22	0.14
Switzerland	1888	1.65	2.27	1.01	0.23	0.14
United Kingdom	1831	1.10	1.71	0.80	0.01	0.00
United States	1870	1.68	1.89	0.79	0.53	0.32
<i>Southern Europe</i>						
Cyprus	1950	6.03	6.66	1.81	2.62	0.43
Greece	1910	2.85	3.41	1.24	0.89	0.31
Italy	1861	1.79	2.57	0.96	0.30	0.17
Portugal	1849	1.97	2.46	0.75	0.65	0.33
Spain	1857	1.34	1.77	0.82	0.21	0.16
Turkey	1935	1.99	2.12	1.36	0.38	0.19
<i>Newly Industrialized Countries</i>						
Hong Kong	1960	4.52	6.40	2.41	0.79	0.18
Japan	1890	2.62	3.67	1.23	0.58	0.22
Singapore	1963	5.02	8.18	2.67	0.53	0.11
South Korea	1910	2.66	4.76	1.49	0.10	0.04
Taiwan	1905	3.15	4.56	1.39	0.71	0.23
Czechoslovakia	1921	3.75	4.76	1.51	1.17	0.31
East Germany	1950	7.03	10.81	1.47	2.48	0.35
Estonia	1990	1.92	1.12	2.25	0.05	0.02
Georgia	1990	-0.88	-3.18	2.05	-1.20	1.37
Hungary	1890	2.85	3.18	0.81	1.25	0.44
Kazakhstan	1990	-0.65	-1.24	2.47	-1.89	2.91
Kyrgystan	1990	-6.40	-5.40	3.24	-6.79	1.06
Latvia	1990	4.27	1.12	0.35	3.66	0.86

Table 1: Improvements in Living Standards, 1870 to 2010

Period	Total Factor Productivity (Average Annual Growth Rate)	Main Sources of Growth	Change in Life Expectancy at Birth (Years per Decade)
1870 to 1900	~ 1.5% to 2%	Transportation, communications, trade, business organization	1.3
1900 to 1920	~ 1%		3.2
1920s	~ 2%	Electricity, internal combustion engines, chemicals, telecommunications	5.6
1930s	~ 3%		3.2
1940s	~ 2.5%		5.3
1950 to 1973	~ 2%	Widespread	1.4
1973 to 1990	< 1%		2.4
1990s	> 1%	Information technology	1.7
2000s	~ 1.5%		1.4
1870 to 2010	~ 1.6% to 1.8%		2.3
1950 to 2010	~ 1.2% to 1.5%		1.8

Sources: Field (2012), Gordon (2010), Carter et al. (2006), Center for Disease Control and Prevention (http://www.cdc.gov/nchs/data/dvs/deaths_2010_release.pdf).

Growth in the 19th Century

Early 19th-century economic growth resulted mainly from rapid increases in population, land, and capital, rather than from growth in TFP, with improvements in labor productivity stemming primarily from capital deepening—that is, more capital per worker. Significant growth in productivity is believed to have occurred mainly in transportation and communications prior to the Civil War, driven by two important innovations: the steam locomotive and the telegraph. For about a 15-year period bracketing the Civil War, however, the data suggest an overall decline in TFP because of disruptions from hostilities surrounding the war.