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APPENDIX

Appendix

Table 1 : Agricultural Production and Capital

Year	Agricultural	Stock of gross fixed	Imported capital (machines)	[1988 price, million baht]
	GDP	capital in agriculture	used in agriculture	
1970	121,864	351,762	426	
1971	126,533	352,378	520	
1972	124,611	349,948	337	
1973	135,329	347,889	371	
1974	139,814	363,046	770	
1975	145,672	366,941	1,476	
1976	154,036	373,004	1,353	
1977	156,729	371,255	1,907	
1978	173,380	384,447	1,929	
1979	169,309	379,412	1,679	
1980	169,921	378,155	2,108	
1981	179,057	379,932	2,868	
1982	182,649	381,159	1,555	
1983	192,003	386,665	1,670	
1984	200,091	386,260	1,756	
1985	208,555	393,885	1,374	
1986	208,103	411,094	1,229	
1987	207,075	413,948	1,853	
1988	229,383	425,226	3,302	
1989	249,843	437,735	4,372	
1990	235,693	457,949	6,830	
1991	252,354	482,416	4,488	
1992	262,667	513,151	4,330	
1993	258,303	559,668	4,883	
1994	270,536	612,263	6,088	
1995	281,752	667,915	7,729	
1996	293,154	729,774	8,048	
1997	291,967	778,588	7,557	
1998	282,665	786,988	1,753	
1999	290,317	845,260	2,526	
2000	298,060	875,561	2,914	
Source:	NESDB	NESDB	FAO	

Table 2 : Agricultural Labor (100,000s)

Year	Labor	[100,000 people]
1970	115.72	
1971	127.40	
1972	111.47	
1973	116.72	
1974	91.41	
1975	107.76	
1976	112.96	
1977	123.20	
1978	132.47	
1979	123.51	
1980	159.43	
1981	134.04	
1982	169.85	
1983	144.65	
1984	157.64	
1985	155.29	
1986	156.81	
1987	160.27	
1988	173.79	
1989	177.38	
1990	197.26	
1991	163.84	
1992	173.05	
1993	162.69	
1994	151.80	
1995	143.89	
1996	141.37	
1997	143.15	
1998	135.71	
1999	139.97	
2000	140.00	

Source: NESDB

Table 3 : Agricultural Imports and Exports (million baht)

Year	All imports	Competitive imports	Noncompetitive imports	Exports	[1988 price, million baht]
1970	2,068	1,003	16	9,971	
1971	2,789	1,637	10	10,940	
1972	3,163	1,874	12	12,994	
1973	3,938	2,403	21	17,515	
1974	5,155	3,172	30	28,991	
1975	5,691	3,343	57	23,491	
1976	6,885	4,104	80	32,081	
1977	9,217	5,089	110	36,596	
1978	8,587	3,982	77	40,860	
1979	10,869	5,252	143	51,800	
1980	16,042	5,595	254	62,506	
1981	15,344	6,106	315	72,998	
1982	12,916	5,138	300	73,150	
1983	14,639	5,699	362	66,484	
1984	16,468	6,466	387	78,292	
1985	13,858	6,469	212	73,398	
1986	14,444	6,220	165	79,397	
1987	19,525	8,018	216	83,259	
1988	26,726	10,335	461	106,432	
1989	31,588	12,289	827	118,508	
1990	40,499	15,399	1,285	100,003	
1991	47,526	18,859	1,383	109,299	
1992	54,128	20,911	1,737	109,997	
1993	52,938	16,456	2,401	110,695	
1994	60,381	20,264	3,216	129,559	
1995	73,522	25,149	3,331	160,312	
1996	82,262	28,749	3,004	167,131	
1997	77,249	25,593	2,122	183,962	
1998	56,890	21,600	883	211,092	
1999	58,571	21,110	1,110	184,947	
2000	66,064	25,206	1,220	197,254	
Source:	FAO	FAO	FAO	Customs Dept.	

Table 4 : Liberalization ("Openness") of the Agricultural Sector

Year	X/GDP "OPENX"	(M+X)/GDP "OPENXM"
1970	0.0818	0.0988
1971	0.0865	0.1085
1972	0.1043	0.1297
1973	0.1294	0.1585
1974	0.2074	0.2442
1975	0.1613	0.2003
1976	0.2083	0.2530
1977	0.2335	0.2923
1978	0.2357	0.2852
1979	0.3059	0.3701
1980	0.3679	0.4623
1981	0.4077	0.4934
1982	0.4005	0.4712
1983	0.3463	0.4225
1984	0.3913	0.4736
1985	0.3519	0.4184
1986	0.3815	0.4509
1987	0.4021	0.4964
1988	0.4640	0.5805
1989	0.4743	0.6008
1990	0.4243	0.5961
1991	0.4331	0.6214
1992	0.4188	0.6248
1993	0.4285	0.6335
1994	0.4789	0.7021
1995	0.5690	0.8299
1996	0.5701	0.8507
1997	0.6301	0.8947
1998	0.7468	0.9481
1999	0.6371	0.8388
2000	0.6618	0.8834

Table 5 : Land Use

Year	Arable Land ("LAND1")	Arable & Permanent Cropland ("LAND2") [1,000 ha]
1970	12,300	13,808
1971	12,431	13,939
1972	13,150	14,750
1973	13,900	15,580
1974	14,624	16,363
1975	14,900	16,680
1976	15,164	16,988
1977	15,773	17,385
1978	16,108	17,776
1979	16,315	18,082
1980	16,515	18,298
1981	16,855	18,681
1982	17,199	19,099
1983	17,293	19,198
1984	17,401	19,331
1985	17,693	19,847
1986	17,810	20,036
1987	17,930	20,490
1988	17,728	20,568
1989	17,581	20,567
1990	17,494	20,603
1991	17,510	20,726
1992	17,238	20,574
1993	17,085	20,445
1994	17,000	20,460
1995	16,839	20,410
1996	16,300	19,800
1997	15,000	18,400
1998	14,977	18,297
1999	14,700	18,000
2000	14,700	18,000
Source:	FAO	FAO

Table 6 : Analyzing Production Growth Functions - Ordinary Least Square (OLS) Results

6.1

LS // Dependent Variable is LOG(GDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.687565	0.670923	1.024803	0.3142
LOG(K)	0.732861	0.055754	13.14453	0.0000
LOG(L)	0.739566	0.097974	7.548583	0.0000
R-squared	0.913797	Mean dependent var		12.21295
Adjusted R-squared	0.907640	S.D. dependent var		0.288241
S.E. of regression	0.087599	Akaike info criterion		-1.940337
Sum squared resid	0.214859	Schwarz criterion		-1.801564
Log likelihood	33.07522	F-statistic		148.4081
Durbin-Watson stat	1.353427	Prob(F-statistic)		0.000000

6.2

LS // Dependent Variable is LOG(GDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.304301	0.887342	-8.231666	0.0000
LOG(K)	0.777674	0.027268	28.51965	0.0000
LOG(L)	0.256115	0.068763	3.724587	0.0009
LOG(LAND1)	1.023086	0.105783	9.671575	0.0000
R-squared	0.980691	Mean dependent var		12.21295
Adjusted R-squared	0.978546	S.D. dependent var		0.288241
S.E. of regression	0.042219	Akaike info criterion		-6.209838
Sum squared resid	0.048127	Schwarz criterion		-6.024807
Log likelihood	56.26539	F-statistic		457.1087
Durbin-Watson stat	1.647806	Prob(F-statistic)		0.000000

6.3

LS // Dependent Variable is LOG(GDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.455814	0.639344	-10.09756	0.0000
LOG(K)	0.650039	0.023118	28.11856	0.0000
LOG(L)	0.199958	0.058638	3.410044	0.0021
LOG(LAND2)	1.089868	0.088694	12.28790	0.0000
R-squared	0.986924	Mean dependent var		12.21295
Adjusted R-squared	0.985471	S.D. dependent var		0.288241
S.E. of regression	0.034744	Akaike info criterion		-3.761725
Sum squared resid	0.032592	Schwarz criterion		-3.576694
Log likelihood	62.30674	F-statistic		679.2716
Durbin-Watson stat	2.012135	Prob(F-statistic)		0.000000

Table 7 : Estimating TFP Growth from the Residual of OLS Results

Year	Actual	Fitted	Residual	Residual Plot
1970	11.7107	11.6886	0.02204	. * .
1971	11.7483	11.7185	0.02976	. * .
1972	11.7330	11.7497	-0.01675	. * .
1973	11.8155	11.8147	0.00073	. * .
1974	11.8481	11.8470	0.00104	. * .
1975	11.8891	11.9078	-0.01866	. * .
1976	11.9449	11.9478	-0.00285	. * .
1977	11.9623	11.9873	-0.02499	. * .
1978	12.0632	12.0487	0.01453	. * .
1979	12.0395	12.0447	-0.00526	. * .
1980	12.0431	12.1066	-0.06348	* . .
1981	12.0955	12.0975	-0.00205	. * .
1982	12.1153	12.1711	-0.05574	* . .
1983	12.1653	12.1539	0.01136	. * .
1984	12.2065	12.1780	0.02858	. * .
1985	12.2480	12.2164	0.03159	. * .
1986	12.2458	12.2564	-0.01065	. * .
1987	12.2408	12.2897	-0.04888	* . .
1988	12.3431	12.3275	0.01562	. * .
1989	12.4286	12.3354	0.09320	. . *
1990	12.3703	12.4029	-0.03262	* .
1991	12.4386	12.4061	0.03248	. * .
1992	12.4786	12.4111	0.06754	. . *
1993	12.4619	12.4864	-0.02449	. * .
1994	12.5082	12.5317	-0.02355	. * .
1995	12.5488	12.5749	-0.02611	. * .
1996	12.5885	12.5959	-0.00741	. * .
1997	12.5844	12.5605	0.02386	. * .
1998	12.5520	12.5507	0.00130	. * .
1999	12.5787	12.5855	-0.00677	. * .
2000	12.6051	12.6084	-0.00338	. * .

Table 8 : Determinants of TFP Growth - Ordinary Least Square (OLS) Results

8.1

LS // Dependent Variable is LOG(RES)

Included observations: 13

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.072016	0.633141	1.693172	0.1213
LOG(OPENXM)	-6.236703	3.011952	-2.070651	0.0652
LOG(OPENXM(-1))	6.532220	2.824070	2.313052	0.0433
R-squared	0.392859	Mean dependent var		0.269979
Adjusted R-squared	0.271431	S.D. dependent var		1.579115
S.E. of regression	1.347873	Akaike info criterion		0.796230
Sum squared resid	18.16762	Schwarz criterion		0.926603
Log likelihood	-20.62170	F-statistic		3.235323
Durbin-Watson stat	2.109084	Prob(F-statistic)		0.082499

8.2

LS // Dependent Variable is LOG(RES)

Included observations: 13

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.139034	0.741895	1.535304	0.1557
LOG(OPENX)	-6.371011	2.509098	-2.539163	0.0294
LOG(OPENX(-1))	6.668807	2.323616	2.870012	0.0167
R-squared	0.484488	Mean dependent var		0.269979
Adjusted R-squared	0.381386	S.D. dependent var		1.579115
S.E. of regression	1.242006	Akaike info criterion		0.632629
Sum squared resid	15.42578	Schwarz criterion		0.763002
Log likelihood	-19.55829	F-statistic		4.699101
Durbin-Watson stat	2.419458	Prob(F-statistic)		0.036408

8.3

LS // Dependent Variable is LOG(RES)

Included observations: 13

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.395871	3.215854	-2.610775	0.0260
LOG(Km)	1.842336	0.881302	2.090471	0.0631
LOG(Km(-1))	-0.693249	0.714780	-0.969878	0.3550
R-squared	0.435383	Mean dependent var		0.269979
Adjusted R-squared	0.322460	S.D. dependent var		1.579115
S.E. of regression	1.299814	Akaike info criterion		0.723616
Sum squared resid	16.89516	Schwarz criterion		0.853989
Log likelihood	-20.14971	F-statistic		3.855568
Durbin-Watson stat	0.558002	Prob(F-statistic)		0.057381

8.4

LS // Dependent Variable is LOG(RES)

Included observations: 13

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.042212	5.195296	-0.200607	0.8450
LOG(X)	-5.900878	2.772065	-2.128694	0.0592
LOG(X(-1))	6.090329	2.590113	2.351376	0.0405
R-squared	0.414747	Mean dependent var		0.269979
Adjusted R-squared	0.297697	S.D. dependent var		1.579115
S.E. of regression	1.323354	Akaike info criterion		0.759513
Sum squared resid	17.51266	Schwarz criterion		0.889886
Log likelihood	-20.38303	F-statistic		3.543319
Durbin-Watson stat	1.922516	Prob(F-statistic)		0.068662

8.5

LS // Dependent Variable is LOG(RES)

Included observations: 13

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.366443	4.089942	-1.067605	0.3108
LOG(M)	1.755069	4.208524	0.417027	0.6855
LOG(M(-1))	-1.298575	4.072714	-0.318848	0.7564
R-squared	0.117728	Mean dependent var		0.269979
Adjusted R-squared	-0.058727	S.D. dependent var		1.579115
S.E. of regression	1.624822	Akaike info criterion		1.169970
Sum squared resid	26.40046	Schwarz criterion		1.300343
Log likelihood	-23.05101	F-statistic		0.667183
Durbin-Watson stat	0.835165	Prob(F-statistic)		0.534581

8.6

LS // Dependent Variable is LOG(RES)

Included observations: 13

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.660733	4.355925	-0.840403	0.4203
LOG(Mc)	0.654384	3.231309	0.202514	0.8436
LOG(Mc(-1))	-0.218244	3.072190	-0.071039	0.9448
R-squared	0.083287	Mean dependent var		0.269979
Adjusted R-squared	-0.100056	S.D. dependent var		1.579115
S.E. of regression	1.656231	Akaike info criterion		1.208264
Sum squared resid	27.43103	Schwarz criterion		1.338637
Log likelihood	-23.29992	F-statistic		0.454270
Durbin-Watson stat	0.878294	Prob(F-statistic)		0.647391

8.7

LS // Dependent Variable is LOG(RES)

Included observations: 13

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.735369	1.388979	-1.249385	0.2400
LOG(Mn)	0.342004	1.074873	0.318181	0.7569
LOG(Mn(-1))	0.019434	1.047432	0.018554	0.9856
R-squared	0.188246	Mean dependent var		0.269979
Adjusted R-squared	0.025895	S.D. dependent var		1.579115
S.E. of regression	1.558535	Akaike info criterion		1.086667
Sum squared resid	24.29031	Schwarz criterion		1.217040
Log likelihood	-22.50953	F-statistic		1.159502
Durbin-Watson stat	0.847888	Prob(F-statistic)		0.352470

8.8

LS // Dependent Variable is LOG(RES)

Included observations: 13

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-62.54848	21.14445	-2.958151	0.0143
LOG(OPENX)	-6.946770	2.585270	-2.687058	0.0228
LOG(X(-1))	5.015500	1.668473	3.006043	0.0132
R-squared	0.506134	Mean dependent var		0.269979
Adjusted R-squared	0.407361	S.D. dependent var		1.579115
S.E. of regression	1.215651	Akaike info criterion		0.589733
Sum squared resid	14.77806	Schwarz criterion		0.720106
Log likelihood	-19.27947	F-statistic		5.124210
Durbin-Watson stat	2.156284	Prob(F-statistic)		0.029379

8.9

LS // Dependent Variable is LOG(RES)

Included observations: 14

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-19.41035	5.422440	-3.579634	0.0043
LOG(OPENX)	-2.300942	0.830169	-2.771655	0.0182
LOG(Km)	2.272654	0.608178	3.736824	0.0033
R-squared	0.570297	Mean dependent var		0.307143
Adjusted R-squared	0.492169	S.D. dependent var		1.523524
S.E. of regression	1.085697	Akaike info criterion		0.351854
Sum squared resid	12.96612	Schwarz criterion		0.488795
Log likelihood	-19.32812	F-statistic		7.299542
Durbin-Watson stat	0.543485	Prob(F-statistic)		0.009603

8.10

LS // Dependent Variable is LOG(RES)

Included observations: 13

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-54.10524	16.63958	-3.251600	0.0100
LOG(OPENX)	-6.165547	2.019896	-3.052408	0.0137
LOG(X(-1))	3.194100	1.448063	2.205774	0.0548
LOG(Km)	1.645209	0.592669	2.775934	0.0215
R-squared	0.733937	Mean dependent var		0.269979
Adjusted R-squared	0.645250	S.D. dependent var		1.579115
S.E. of regression	0.940535	Akaike info criterion		0.125047
Sum squared resid	7.961457	Schwarz criterion		0.298878
Log likelihood	-15.25901	F-statistic		8.275540
Durbin-Watson stat	1.375977	Prob(F-statistic)		0.005912

Biography

Michael Riggs was born 9 May 1966 in California, USA. Prior to attending Chulalongkorn University, he received a Bachelor of Art in Microbiology from the University of California, Santa Barbara, and an MBA in Marketing from Columbia University, New York. He has worked in multinational corporations, as an independent consultant and for international organizations, in the fields of health care, project management and most recently information management and development. At present he is working at the Food and Agriculture Organization of the United Nations' Regional Office for Asia and the Pacific.

