Turkey

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Outline

Outline

Map

Brief history

- 1960: First coup in the Turkish Republic.
- 1971: Economic downturn leads to widespread unrest.
- 1980: Clashes between left- and right-wing groups lead to another army coup.
- 1997: Military offers series of "recommendations" after rise of Welfare party.
- Justice and Development Party (AKP) in power since 2002. More stability due to economic growth.
- 2016: Failed coup.
- 2018: Executive Presidency.

Source: Aljazeera

Turkey currently

- GDP 2017 estimate: $1.69 trillion (USD)
- GDP growth 2016: 3.2%
- Projected GDP growth 2017: 7.0%
- Projected GDP growth 2018: 4.4%
- Projected GDP growth 2019: 4.0%

- Population 2017: 80 million
- Unemployment 2017: 11%
- Top trading partners: China, Germany, Russia, US, Italy

Source: IMF

Outline
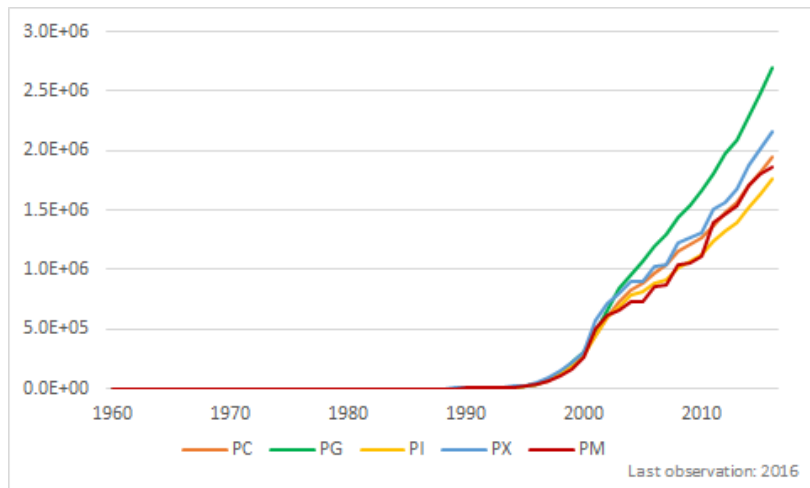
Quantity components of GDP
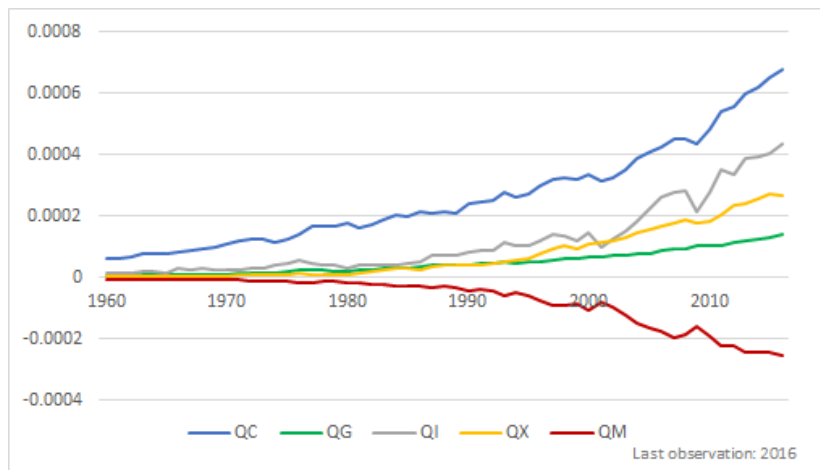
Note: Annual data, all prices normalized to 1 in 1960.

Price components of GDP

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Price components of GDP
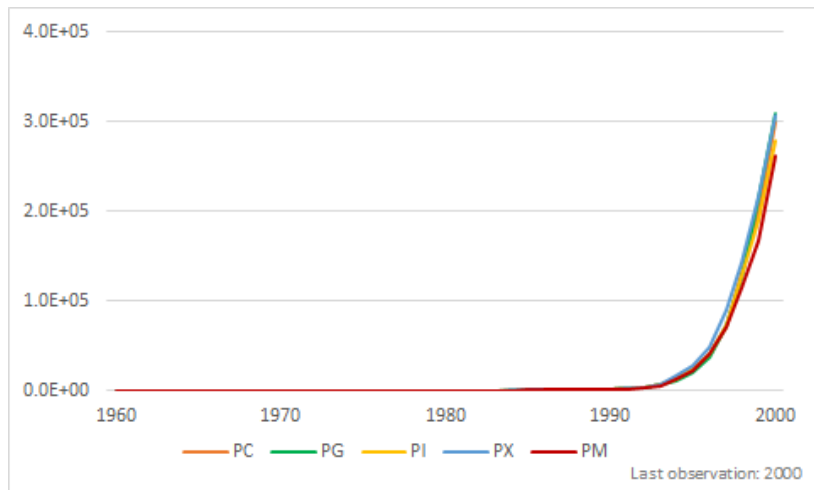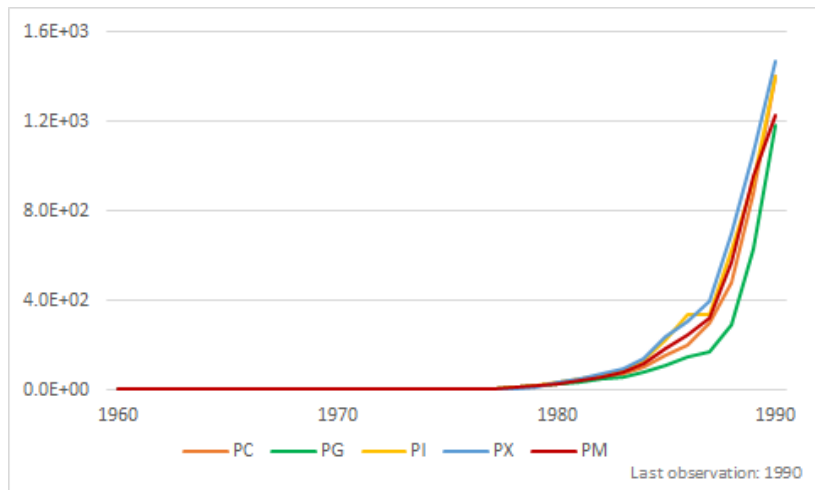

Note: Annual data, all prices normalized to 1 in 1960.
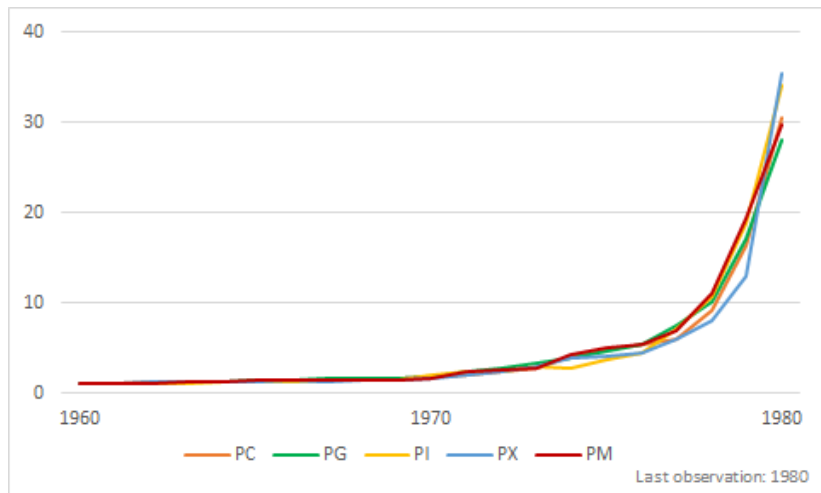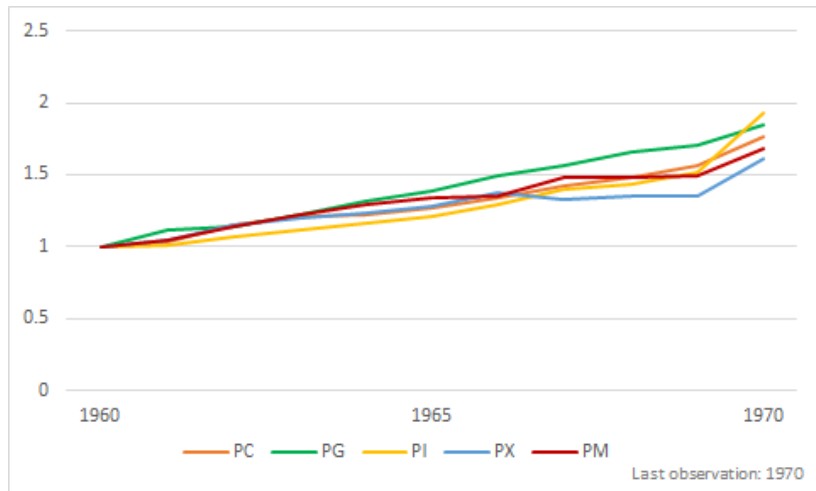
Price components of GDP

Note: Annual data, all prices normalized to 1 in 1960.

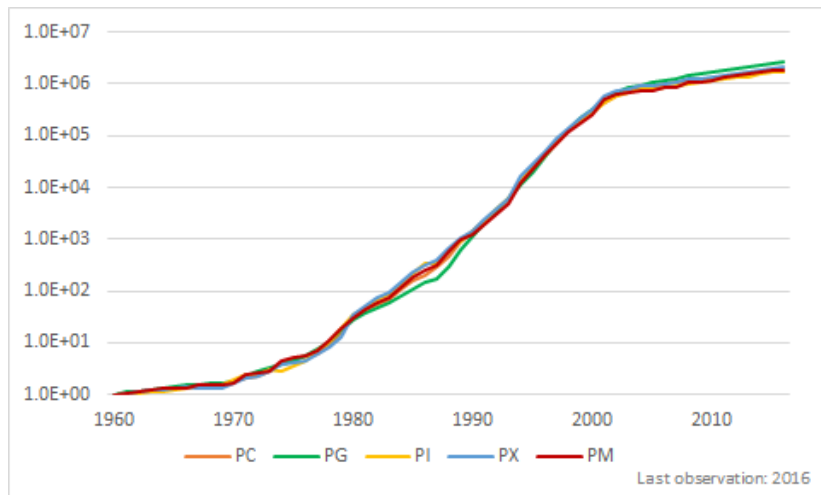# Price components of GDP

Note: Annual data, all prices normalized to 1 in 1960.

Price components of GDP

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Price components of GDP

Note: Annual data, all prices normalized to 1 in 1960, log scale.

Price of consumption and labour, real wages

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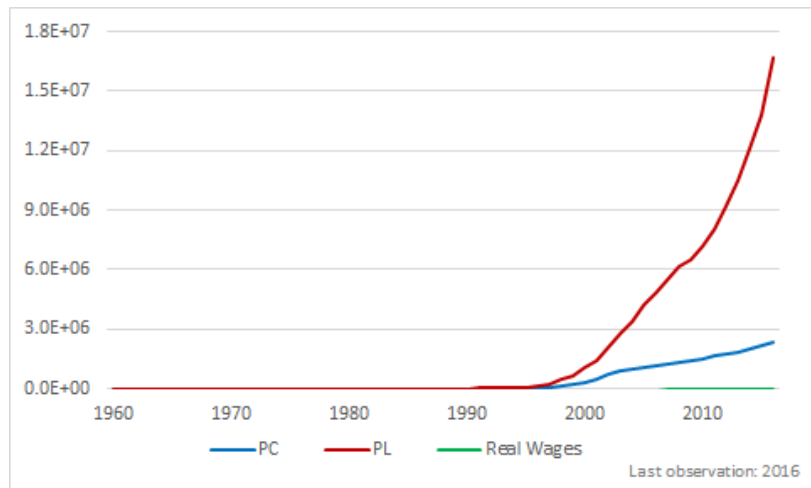
Price of consumption and labour, real wages
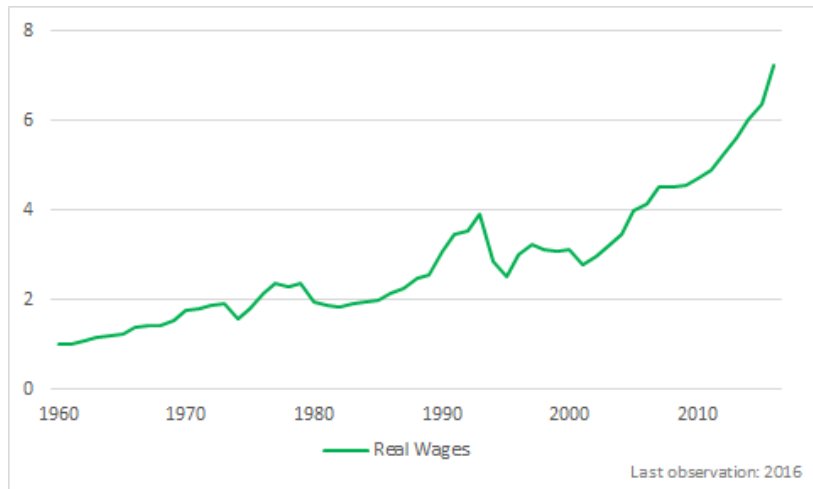
Note: Annual data, all prices normalized to 1 in 1960.

Price of imports and exports
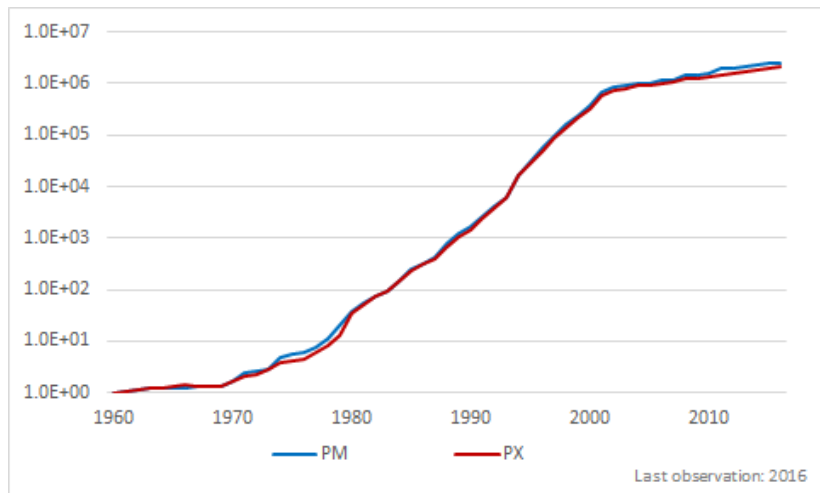
Note: Annual data, all prices normalized to 1 in 1960, log scale.

Terms of Trade
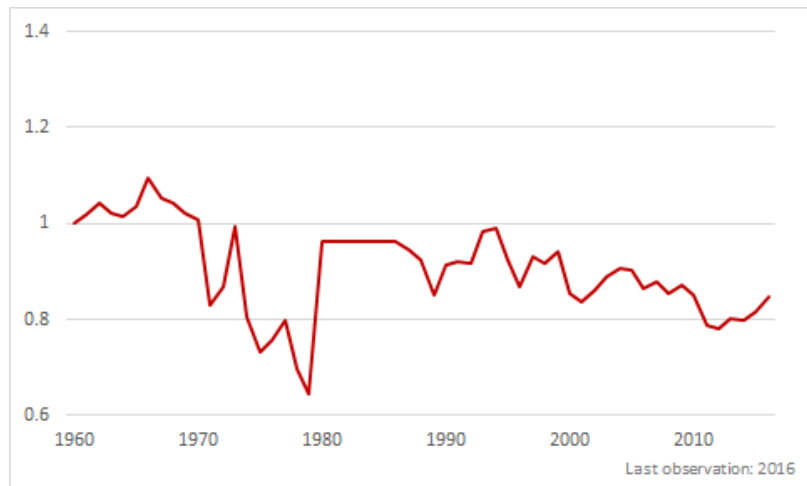
Note: Annual data.

Working age population and employment status
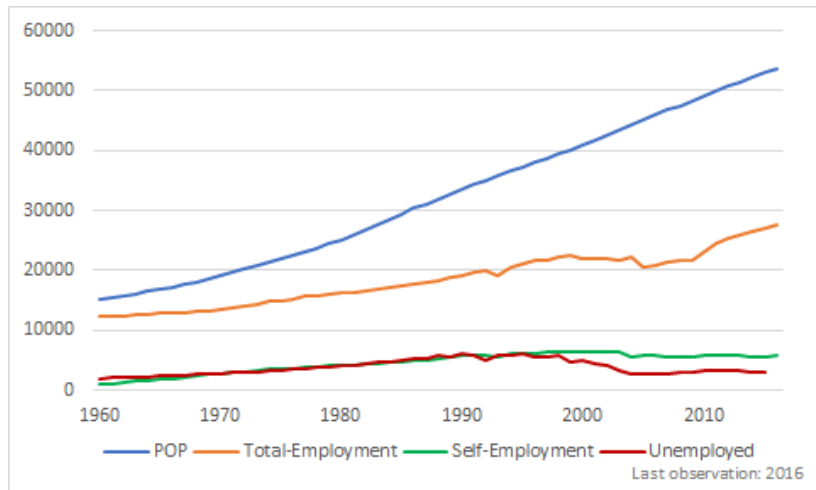
Note: Annual data, thousands of people.

Average hours worked per annum
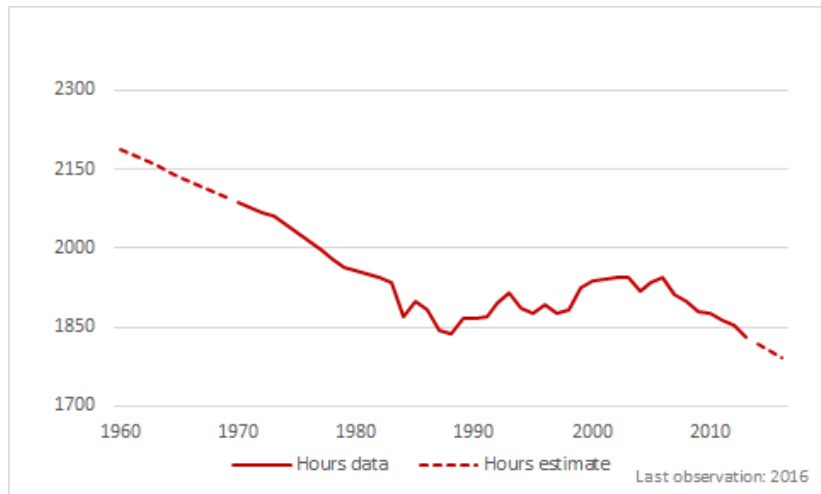
Note: Annual data.

Wages and inflation
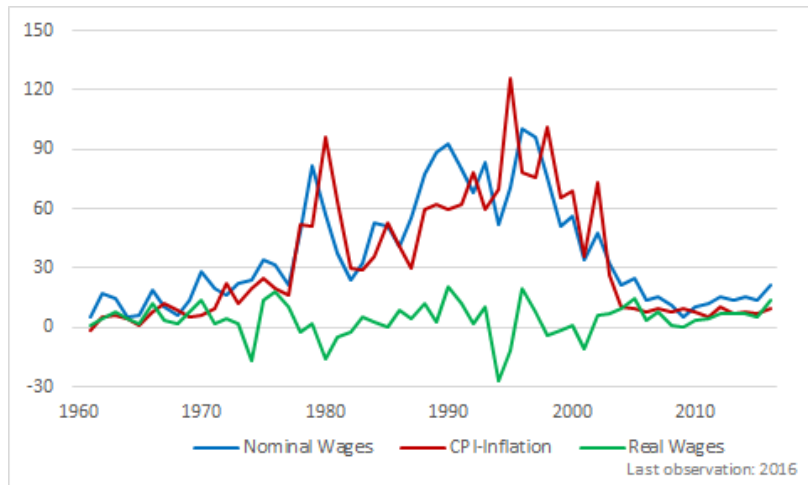
Note: Annual data, year-over-year percent.

Taxes
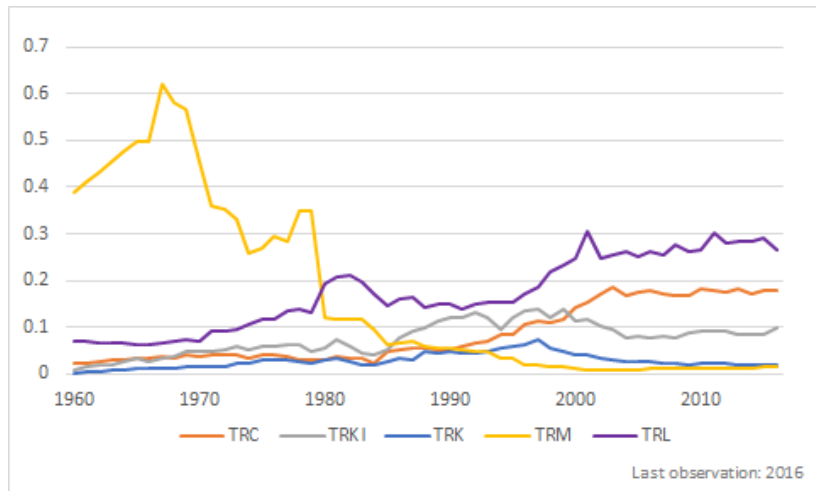
Note: Annual data, taxes on exports and subsidies on consumption have been zero since 1960.

Depreciation and capital-output ratios
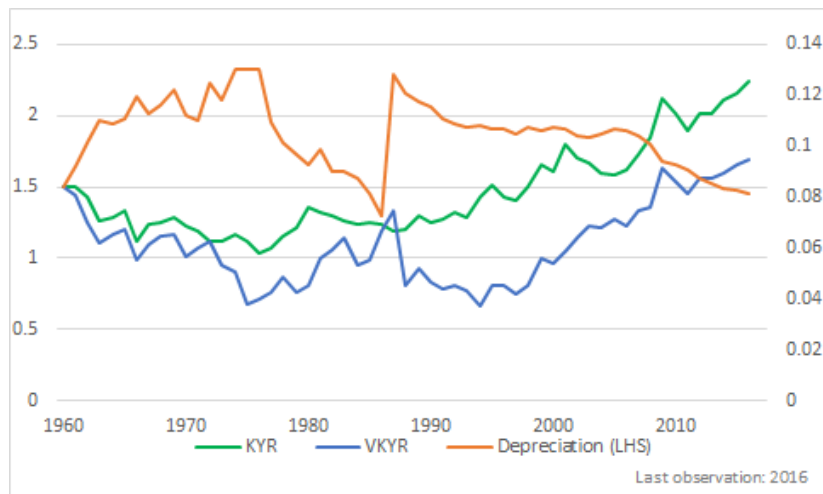
Note: Annual data, a maximum depreciation of 13% was imposed.

Rates of return
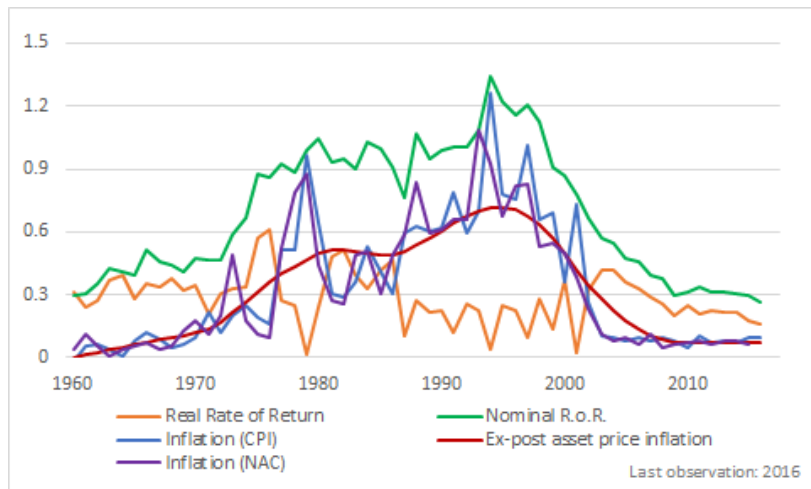
Note: Annual data, year-over-year percent, the ex-post asset price inflation has been smoothed non-parametrically.

Outline

Labour and capital shares
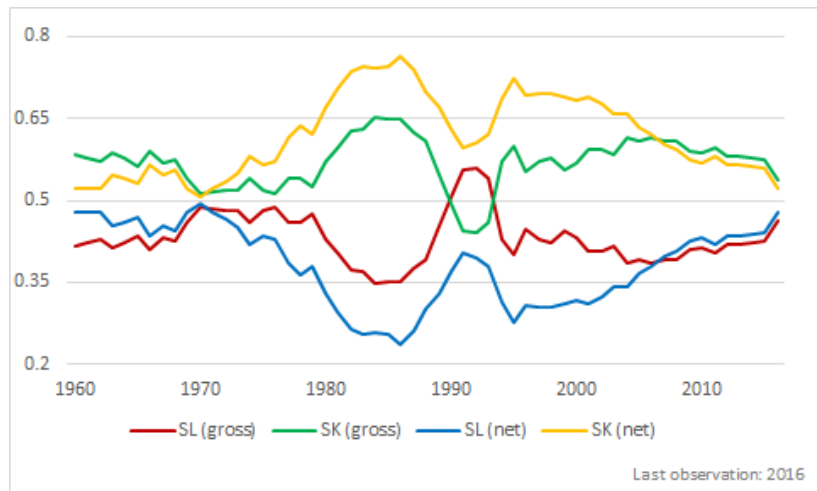
Note: Annual data.

Labour and capital shares
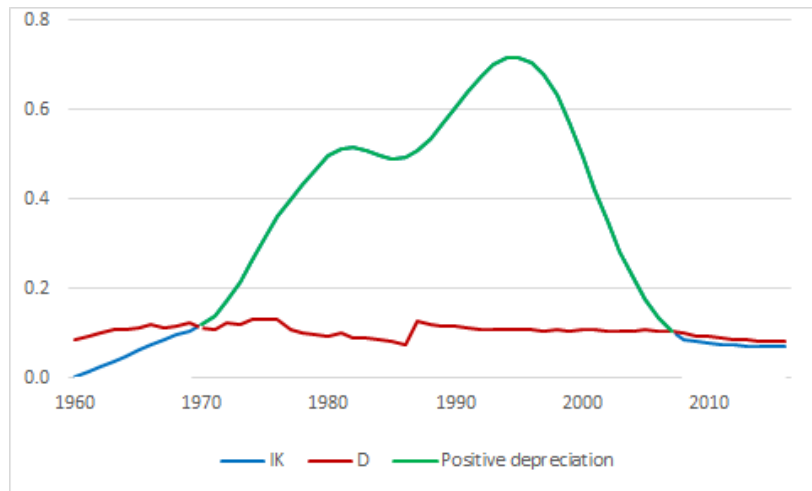
Note: Annual data.

Kohli decomposition (net) ouputs
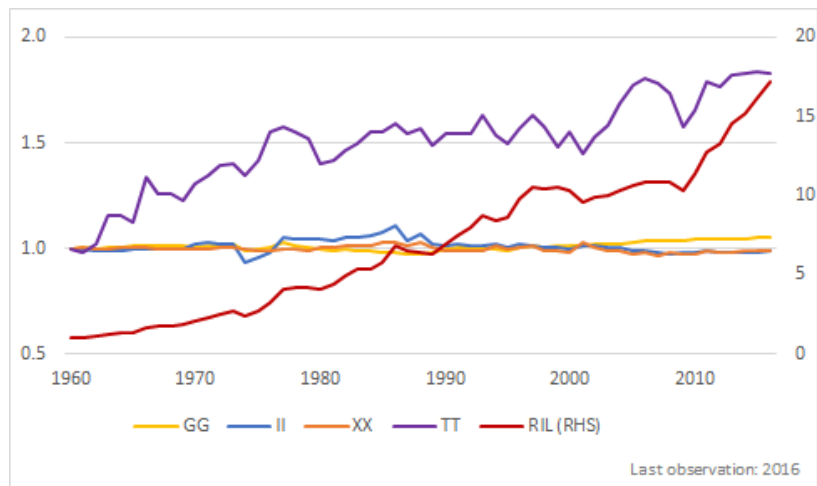
Note: Annual data.

Kohli decomposition (net) inputs
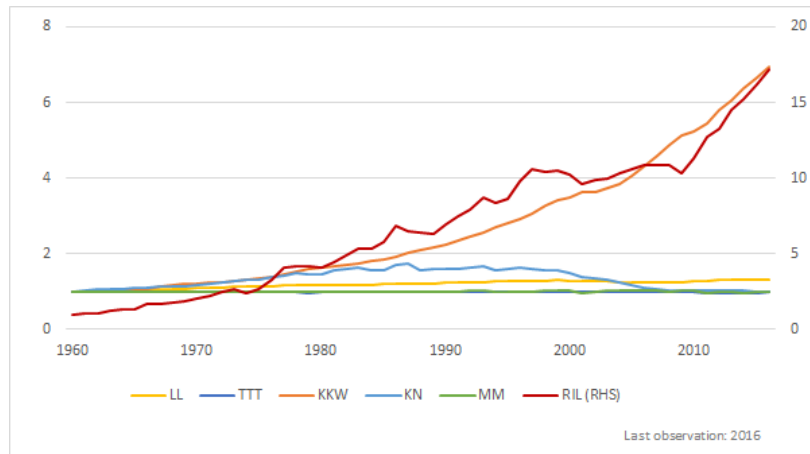
Note: Annual data.

Diewert-Morrison decomposition
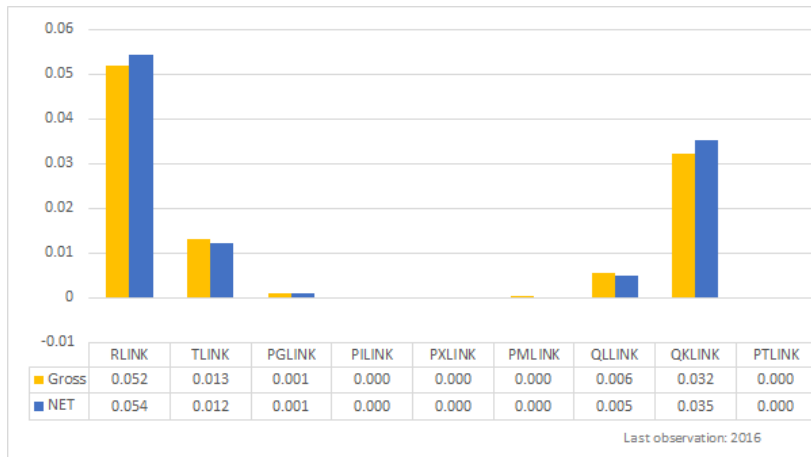
Note: Annual data, average annual growth of real income, and average annual contribution to growth.

Productivity
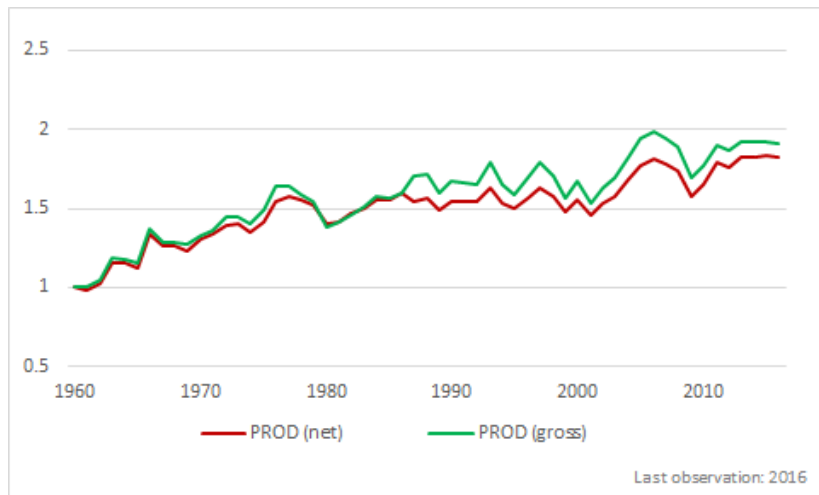
Note: Annual data.

Real income per capital
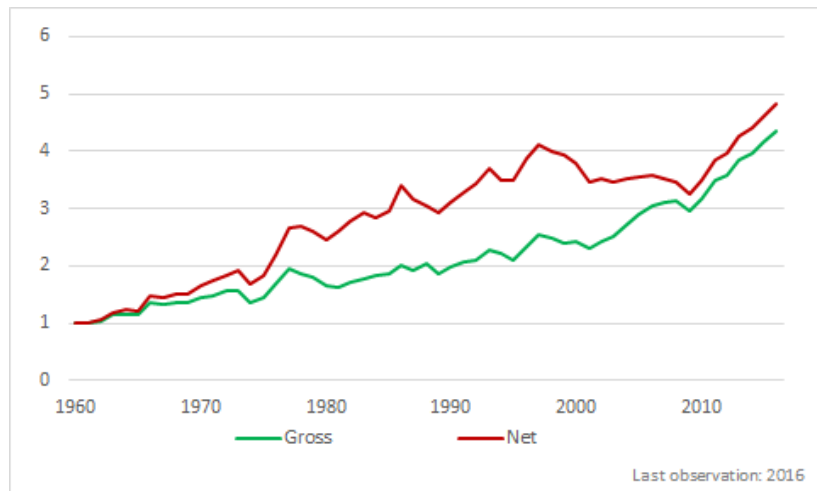
Note: Annual data.

Outline

Results from PMODs 1-3

Statistic	Seeking	PMOD1	PMOD2	PMOD3 (not CRS)	PMOD3 with CRS
R-squared (average)		0.855	0.928	0.973	0.952
Starting LL		218.660	586.625	2202.144	2938.219
Ending LL		586.627	801.275	3632.879	3520.780
E11	+	0.455	0.245		
E22	+	-0.116	-0.192		
E33	+	-0.705	-0.629		
E44	+	0.036	0.399		
E55	-	-1.035	-1.178		
E66	-	-1.421	0.138		
Curvature conditions:		Failed	Failed	IMPOSED	IMPOSED
TECH:	0.0108	0.0090	0.0128	0.0295	0.0046
RTS:		Constant	Constant	0.44931	Constant
Function:		Translog	Translog	Leontief no substitution	Leontief no substitution
Splines:		No	Yes	No	No

Results from PMODs 4-7

Statistic	Seeking	PMOD4	PMOD5	PMOD6	PMOD7
R-squared (average)		0.953	0.956	0.956	0.956
Starting LL		3520.77	3533.80	3533.80	3533.80
Ending LL		3533.81	3543.73	3543.73	3543.73
E11	+	0.047	0.061	0.061	0.061
E22	+	0.011	0.128	0.128	0.128
E33	+	0.201	0.216	0.216	0.216
E44	+	0.186	0.866	0.866	0.866
E55	-	-0.316	-0.871	-0.871	-0.871
E66	-	0.000	-0.055	-0.055	-0.055
Curvature conditions:		IMPOSED	IMPOSED	IMPOSED	IMPOSED
TECH:	0.0108	0.0046	0.0048	0.0048	0.0048
Function:		Normalized Quadratic	Normalized Quadratic	Normalized Quadratic	Normalized Quadratic
Possible rank of substitution matrix:		1	2	3	4
Actual rank of substitution matrix:		1	2	2	2

Results from PMOD 12

Statistic			
		Possible rank of substitution matrix:	4
Starting LL	3605.136		
		Actual rank of substitution matrix:	3
Ending LL	3788.646		
		Possible time trends in the substitution matrix:	4
Curvature conditions:	Imposed		
		Actual time trends in the substitution matrix:	2
Function:	Normalized Quadratic with splines for technical progress		
R-squared's			
1	0.9853	E11 (+)	0.6683
2	0.9976	E22 (+)	0.4191
3	0.9789	E33 (+)	0.2722
4	0.9975	E44 (+)	0.3813
5	0.9803	E55 (-)	-1.5080
6	0.9519	E66 (-)	-0.5230
Tech from index:	0.0108	Estimated tech:	0.0089
BIAS 0	-0.0043		
BIAS 1	-0.0037		
BIAS 2	-0.0008		
BIAS 3	-0.0019		
BIAS 4	0.0048		
BIAS 5	-0.0043		
BIAS 6	0.0191		

Productivity and Tech from PMOD12
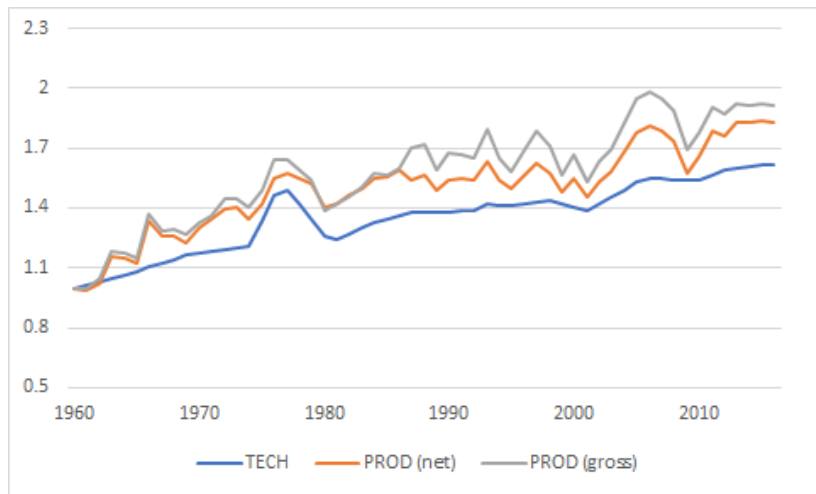
Note: Annual data.

Elasticities PMOD12
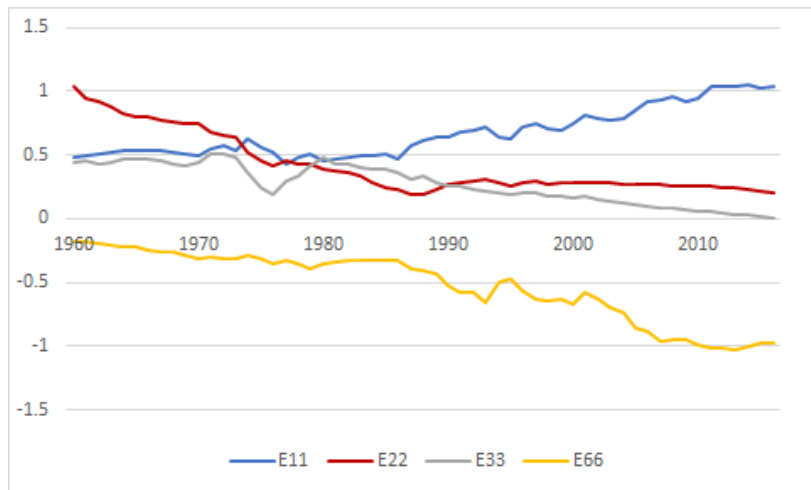
Note: Annual data.

Elasticities from PMOD12

Note: Annual data.

Outline

Results from CMODs

	CMOD1	CMOD2	CMOD3	CMOD4
Curvature Conditions	Satisfied	Imposed	Imposed	Imposed
Function:	Normalized Quadratic	Normalized Quadratic	Normalized Quadratic	Normalized Quadratic, with splines
R-squared				
1	0.947	0.947	0.989	0.997
2	-	-	0.904	0.969
Starting LL	45.650	6.328	311.231	659.401
Ending LL	152.203	152.203	659.401	744.141
E11	-0.052	-0.052	-1.451	-0.162
E12	0.052	0.052	1.451	0.162
E21	0.100	0.100	3.005	0.334
E22	-0.100	-0.100	-3.005	-0.334
ECU1	1.021	1.021	0.934	1.163
ECU2	0.907	0.907	1.207	0.488
Indirect Utility	0.134	0.134	0.130	0.130
Starting Point	0.053	0.053	0.052	0.053
Index U	0.131	0.131	0.131	0.131
Starting U	0.053	0.053	0.053	0.053

Elasticities from CMOD4
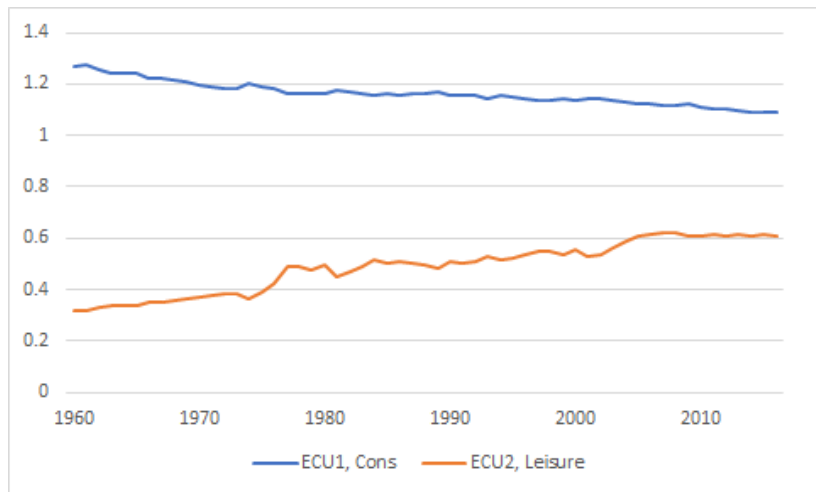
Note: Annual data.

Utilities from CMOD4
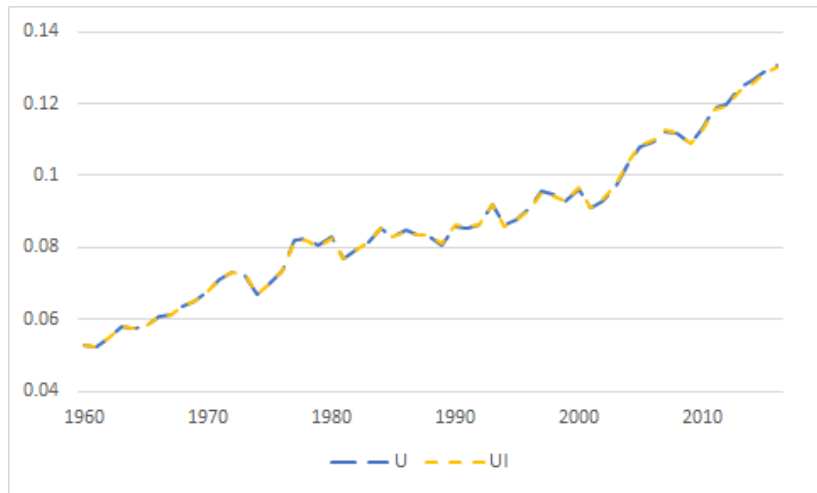
Note: Annual data.

Outline

Results from non-parametric equations 1-6

|	Non-par 1	Non-par 2	Non-par 3	Non-par 4	Non-par 5	Non-par 6
1992	1	1	1	1	0.661	0.854
1993	1	1	1	1	0.782	0.900
1994	1	1	1	1	0.775	0.887
1995	0.958	0.914	0.946	0.913	0.740	0.861
1996	0.976	0.975	0.974	0.968	0.826	0.902
1997	1	1	1	1	0.901	0.940
1998	1	1	1	1	0.832	0.889
1999	0.899	0.881	0.898	0.881	0.698	0.788
2000	0.942	0.921	0.942	0.909	0.795	0.851
2001	1	1	1	1	0.712	0.778
2002	1	1	1	1	0.780	0.830
2003	0.986	0.981	0.986	0.947	0.818	0.855
2004	1	1	1	0.968	0.915	0.929
2005	1	1	1	1	0.981	0.982
2006	1	1	1	1	1	1
2007	1	1	1	1	0.986	0.984
2008	1	0.987	0.989	0.986	0.961	0.952
2009	1	0.961	0.987	0.940	0.841	0.828
2010	0.966	0.927	0.924	0.922	0.907	0.888
2011	1	1	1	0.989	0.981	0.971
2012	1	1	1	1	0.969	0.961
2013	1	1	1	1	1	1
2014	1	1	1	1	0.998	0.998
2015	1	1	1	1	1	1
2016	1	1	1	1	0.997	0.996
Number of Inefficiencies:	6	8	8	10	22	22

Relationship between non-parametric efficiency and index number productivity
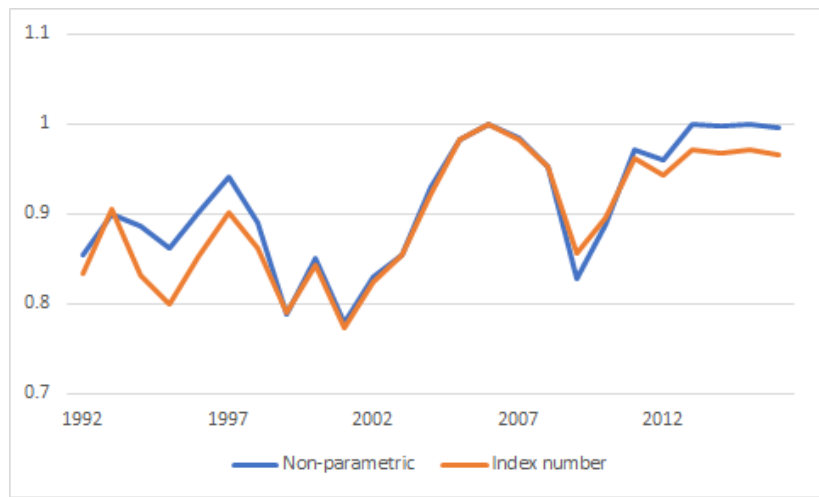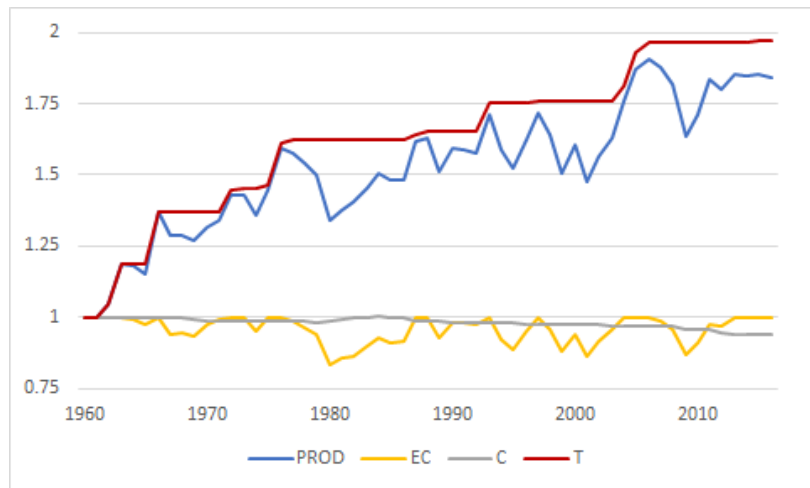

Note: Annual data.

Kohli Decomposition from non-parametric
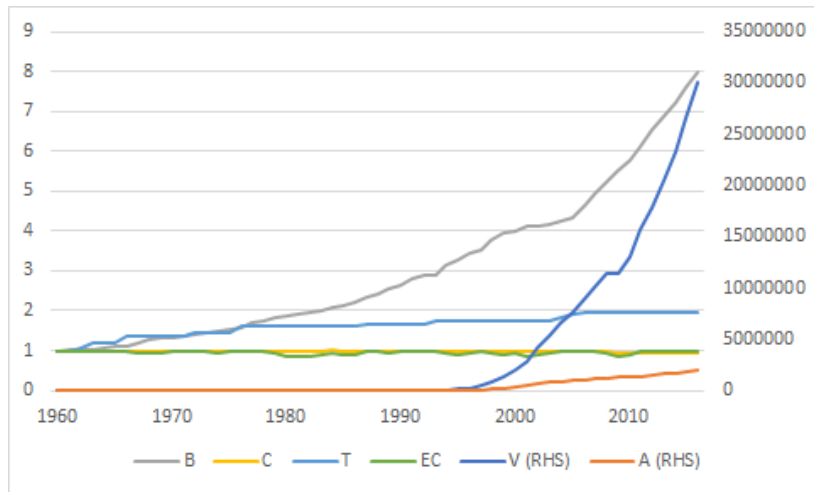
Note: Annual data, V=A*B*C*EC*T

Productivity Decomposition

Note: Annual data, Prod = C*T*EC

END

THANK YOU!