

**Data Appendix**

“Are Shocks to the Terms of Trade Shocks to Productivity?”

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## Original Data: Annual Frequency

Series Number	Country	Description	Source	Unit
OA.1	Mexico	Gross Domestic Product	IFS	bil. Pesos
OA.2	Mexico	Gross Fixed Capital Formation	IFS	bil. Pesos
OA.3	Mexico	Change in Inventories	IFS	bil. Pesos
OA.4	Mexico	GDP Deflator	IFS	index (2000=100)
OA.5	Mexico	Employment	OECD PLFS	thd. persons
OA.6	Mexico	Annual Hours Worked	OECD ELMS	hours per year
OA.7	Mexico	Total Hours Worked	BKKS 2002	hours per week
OA.8	Mexico	Consumption of Fixed Capital	OECD ANA	bil. Pesos
OA.9	Mexico	Exports of goods and services	OECD ANA	mil. Pesos
OA.10	Mexico	Imports of goods and services	OECD ANA	mil. Pesos
OA.11	Mexico	Exports of goods and services	OECD ANA	mil. Pesos, 2000 prices
OA.12	Mexico	Imports of goods and services	OECD ANA	mil. Pesos, 2000 prices
OA.13	Mexico	Gross Domestic Product	OECD ANA	mil. Pesos, 2000 prices
OA.14	Mexico	Exports of goods and services	UN YB 1988	bil. Pesos
OA.15	Mexico	Exports of goods and services	UN YB 1988	bil. Pesos, 1980 prices
OA.16	Mexico	Imports of goods and services	UN YB 1988	bil. Pesos
OA.17	Mexico	Imports of goods and services	UN YB 1988	bil. Pesos, 1980 prices
OA.18	Mexico	Gross Domestic Product	UN YB 1988	bil. Pesos, 1980 prices
OA.19	Mexico	Exports of goods and services	UN YB 96-97	mil. New Pesos
OA.20	Mexico	Exports of goods and services	UN YB 96-97	mil. New Pesos, 1993 Prices
OA.21	Mexico	Imports of goods and services	UN YB 96-97	mil. New Pesos
OA.22	Mexico	Imports of goods and services	UN YB 96-97	mil. New Pesos, 1993 Prices
OA.23	Mexico	Gross Domestic Product	UN YB 96-97	mil. New Pesos, 1993 Prices
OA.24	United States	Gross Output	BEA GDPbyInd_VA_NAICS_1998-2005	mil. Dollars
OA.25	United States	Imports of goods and services	BEA NIPA T1.1.5, L17	bil. Dollars
OA.26	United States	Gross Domestic Product	BEA NIPA T1.1.6, L1	bil. Dollars, 2000 prices
OA.27	United States	Gross Domestic Product	BEA NIPA T1.1.5, L1	bil. Dollars

<b>Series Number</b>	<b>Country</b>	<b>Description</b>	<b>Source</b>	<b>Unit</b>
OA.28	United States	Gross Private Investment	BEA NIPA T1.1.5, L6	bil. Dollars
OA.29	United States	Gross Government Investment	BEA NIPA T3.1, L35	bil. Dollars
OA.30	United States	Consumption of Fixed Capital	BEA NIPA T1.7.5, L5	bil. Dollars
OA.31	United States	Employment	OECD PLFS	thd. persons
OA.32	United States	Employment	BLS, Nonfarm Employees	thd. persons
OA.33	United States	Annual Hours Worked	OECD ELMS	hours per year
OA.34	United States	Weekly Hours Worked	BLS, Total Private Production Workers	hours per week
OA.35	United States	Export Price	NIPA T1.1.4, L14	index (2000=100)
OA.36	United States	Import Price	NIPA T1.1.4, L17	index (2000=100)
OA.37	Switzerland	Exports of goods and services	OECD ANA	mil. Francs
OA.38	Switzerland	Imports of goods and services	OECD ANA	mil Francs
OA.39	Switzerland	Exports of goods and services	OECD ANA	mil. Francs, 2000 prices
OA.40	Switzerland	Imports of goods and services	OECD ANA	mil. Francs, 2000 prices
OA.41	Switzerland	Gross Domestic Product	KR 2003, C1	mil Francs, 1995 prices
OA.42	Switzerland	Gross Domestic Product	KR 2003, C2	mil. Francs
OA.43	Switzerland	Investment	KR 2003, C4	mil. Francs
OA.44	Switzerland	Gross Fixed Capital Formation	OECD ANA	mil. Francs
OA.45	Switzerland	Gross Domestic Product	OECD ANA	mil. Francs
OA.46	Switzerland	Gross Domestic Product	OECD ANA	mil Francs, 2000 prices
OA.47	Switzerland	Consumption of Fixed Capital	OECD ANA	mil. Francs
OA.48	Switzerland	Employment	OECD PLFS	thd. persons
OA.49	Switzerland	Annual Hours Worked	OECD ELMS	hours per year

## Original Data: Quarterly Frequency

<b>Series Number</b>	<b>Country</b>	<b>Description</b>	<b>Source</b>	<b>Unit</b>
OQ.1	United States	Exports	OECD QNA	mil. Dollars
OQ.2	United States	Imports	OECD QNA	mil. Dollars
OQ.3	United States	Gross Domestic Product	OECD QNA	mil. Dollars
OQ.4	United States	Implicit Price Deflator, Exports	OECD QNA	index (2000=100)
OQ.5	United States	Implicit Price Deflator, Imports	OECD QNA	index (2000=100)
OQ.6	United States	Implicit Price Deflator, GDP	OECD QNA	index (2000=100)
OQ.7	Switzerland	Exports	OECD QNA	mil. Francs
OQ.8	Switzerland	Imports	OECD QNA	mil. Francs
OQ.9	Switzerland	Gross Domestic Product	OECD QNA	mil. Francs
OQ.10	Switzerland	Implicit Price Deflator, Exports	OECD QNA	index (2000=100)
OQ.11	Switzerland	Implicit Price Deflator, Imports	OECD QNA	index (2000=100)
OQ.12	Switzerland	Implicit Price Deflator, GDP	OECD QNA	index (2000=100)

## Notes:

1. OECD QNA is the Organization for Economic Cooperation and Development's *Quarterly National Accounts*, which may be accessed at [www.sourceoecd.org](http://www.sourceoecd.org)
2. OECD ANA is the Organization for Economic Cooperation and Development's *Annual National Accounts*, which may be accessed at [www.sourceoecd.org](http://www.sourceoecd.org)
3. OECD PLFS is the Organization for Economic Cooperation and Development's *Population and Labor Force Statistics*, which may be accessed at [www.sourceoecd.org](http://www.sourceoecd.org)
4. OECD ELMS is the Organization for Economic Cooperation and Development's *Employment and Labor Market Statistics*, which may be accessed at [www.sourceoecd.org](http://www.sourceoecd.org)
5. IFS is the International Monetary Fund's *International Financial Statistics* database.
6. BEA is the Bureau of Economic Analysis. The data from the BEA can be obtained from [www.bea.gov](http://www.bea.gov)
7. BLS is the Bureau of Labor Statistics. The data from the BLS can be obtained from [www.bls.gov](http://www.bls.gov)
8. KR 2003 is data from: Kehoe, T.J. and Ruhl, K.J. (2003) "Recent Great Depressions: Aggregate Growth in New Zealand and Switzerland," *New Zealand Economic Papers*, 37: 5-40. This data is available at [www.econ.umn.edu/~tkehoe](http://www.econ.umn.edu/~tkehoe)
9. BKKS 2002 is data from: Bergoeing, R, Kehoe, PJ, Kehoe, TJ, and Soto, R. (2002) "A Decade Lost and Found: Mexico and Chile in the 1980s," *Review of Economic Dynamics*, 5: 166-205. This data is available at [www.econ.umn.edu/~tkehoe](http://www.econ.umn.edu/~tkehoe)
10. UN YB is the United Nations *Yearbook of National Accounts Statistics*

### Constructed Data: Annual Frequency

Series Number	Country	Description	Unit
CA.1	Mexico	Terms of Trade	index (1994=100)
CA.2	Mexico	Real GDP	index (1994=100)
CA.3	Mexico	Command GDP	mil. 2000 Pesos
CA.4	Mexico	Command GDP	index (1994=100)
CA.5	United States	Import-Gross Output Ratio	percent
CA.6	United States	Terms of Trade	index (2000=100)
CA.7	Switzerland	Terms of Trade	index (2000=100)
CA.8	Mexico	Terms of Trade	index (1980=100)
CA.9	Mexico	Terms of Trade	index (1993=100)

### Constructed Data: Quarterly Frequency

Series Number	Country	Description	Unit
CQ.1	United States	Real GDP	mil. 2000 dollars
CQ.2	United States	Command GDP	mil. 2000 dollars
CQ.3	United States	Deviation from HP Trend, Log-GDP	none
CQ.4	United States	Deviation from HP Trend, Log-Command GDP	none
CQ.5	United States	Terms of Trade	index (2000=100)
CQ.6	Switzerland	Real GDP	mil. 2000 Francs
CQ.7	Switzerland	Command GDP	mil. 2000 Francs
CQ.8	Switzerland	Deviation from HP Trend, Log-GDP	none
CQ.9	Switzerland	Deviation from HP Trend, Log-Command GDP	none
CQ.10	Switzerland	Terms of Trade	index (2000=100)

### **Construction Notes:**

CA.1  $(OA.10/OA.12)/(OA.9/OA.11)$  indexed to 2000

CA.2  $OA.1/OA.4$

CA.3 See notes below.

CA.4  $OA.13-OA.11+(OA.9-OA.10)/(OA.10/OA.12)$

CA.5  $(OA.16/OA.17)/(OA.14/OA.15)*100$

CA.6  $(OA.21/OA.22)/(OA.19/OA.20)*100$

CA.7  $OA.25/OA.24$

CA.8 See notes below.

CA.9  $(OA.36/OA.35)*100$

CA.10  $(OA.38/OA.40)/(OA.37/OA.39)*100$

CA.11 OA.41 ratio-spliced to OA.46 in 1970

CA.12 See notes below.

CQ.1  $OQ.3/(OQ.6/100)$

CQ.2  $CQ.1 - OQ.1/(OQ.4/100) + OQ.1/(OQ.5/100)$

CQ.3  $\log(CQ.1)$  after applying the Hodrick-Prescott filter with smoothing parameter 1600

CQ.4  $\log(CQ.2)$  after applying the Hodrick-Prescott filter with smoothing parameter 1600

CQ.5  $OQ.5/OQ.4 * 100$

CQ.6  $OQ.9/(OQ.12 /100)$

CQ.7  $CQ.6 - OQ.7/(OQ.10/100) + OQ.7/(OQ.11/100)$

CQ.8  $\log(CQ.6)$  after applying the Hodrick-Prescott filter with smoothing parameter 1600

CQ.9  $\log(\text{CQ.7})$  after applying the Hodrick-Prescott filter with smoothing parameter 1600

CQ.10  $\text{OQ.11}/\text{OQ.10} * 100$

CQ.11  $\text{OQ.14}/\text{OQ.13} * 100$

## TFP Construction

Total factor productivity is calculated as

$$A_t = \frac{GDP_t}{K^\alpha L^{1-\alpha}}$$

where  $K$  is the capital stock and  $L$  is the total number of hours worked in the country. The capital stock is constructed using the perpetual inventory method: for a given depreciation rate and initial value, the capital stock in period  $t$  is a function of the last period's capital stock and current period investment,

$$K_t = (1 - \delta)K_{t-1} + I_t.$$

The initial capital stock and the depreciation rate,  $\delta$ , are chosen to satisfy two criteria: 1) the capital-output ratio in the first available period (1950 for the U.S. and Mexico, 1955 for Switzerland) is the same as the average capital-output ratio over the next ten years, and 2) the depreciation-output ratio of the constructed capital stock must match the consumption of fixed capital to GDP ratio from the data. All relevant calculations can be found in the file "fig1&2&9Apr08.xls."

## Figures: Construction

Figure 1: OA.26, CA.8, and CA.9

Figure 2: CA.1, CA.2, and CA.3

Figure 5: CQ.1, CQ.2, and CQ.5

Figure 6: CQ.6, CQ.7, and CQ.10

Figure 7: CQ.3 and CQ.4

Figure 8: CQ.8 and CQ.9



Figure 9: CA.10, CA.11, and CA.12