

Data Appendix for  
 “Sudden Stops, Sectoral Reallocation, and Real Exchange Rates”  
 Timothy J. Kehoe and Kim J. Ruhl

Annual Data

	<b>Series</b>	<b>Country</b>	<b>Source</b>	<b>Unit</b>
OA.1	GDP	Mexico	IFS - 27399B.CZF...	Mil Pesos
OA.2	GDP deflator	Mexico	IFS - 27399BIRZF...	Index 2000=100
OA.3	Gross fixed capital formation	Mexico	IFS - 27393E.CZF...	Mil Pesos
OA.4	Changes in inventories.	Mexico	IFS - 27393I.CZF...	Mil Pesos
OA.5	Exports	Mexico	OECD	Mil Pesos
OA.6	Imports	Mexico	OECD	Mil Pesos
OA.7	Exports	Mexico	OECD	Mil 2000 Pesos
OA.8	Imports	Mexico	OECD	Mil 2000 Pesos
OA.9	Exchange rate	Mexico	IFS - 273..AF.ZF...	Pesos/USD
OA.10	Gross output ag., fishing, forestry	Mexico	INEGI	Pesos
OA.11	Gross output, mining	Mexico	INEGI	Pesos
OA.12	Gross output, manufacturing	Mexico	INEGI	Pesos
OA.13	Gross output total	Mexico	INEGI	Pesos
OA.14	Gross output ag., fishing, forestry	Mexico	INEGI	Pesos, 1993 prices
OA.15	Gross output, mining	Mexico	INEGI	Pesos, 1993 prices
OA.16	Gross output, manufacturing	Mexico	INEGI	Pesos, 1993 prices
OA.17	Gross output total	Mexico	INEGI	Pesos, 1993 prices
OA.18	Gross output ag., fishing, forestry	U.S.	BEA (Annual Industry Accounts)	Bil USD
OA.19	Gross output, mining	U.S.	BEA (Annual Industry Accounts)	Bil USD
OA.20	Gross output, manufacturing	U.S.	BEA (Annual Industry Accounts)	Bil USD
OA.21	Gross output total	U.S.	BEA (Annual Industry Accounts)	Bil USD
OA.22	Gross output ag., fishing, forestry	U.S.	BEA (Annual Industry Accounts)	Index 2000=100
OA.23	Gross output, mining	U.S.	BEA (Annual Industry Accounts)	Index 2000=100
OA.24	Gross output, manufacturing	U.S.	BEA (Annual Industry Accounts)	Index 2000=100
OA.25	Gross output total	U.S.	BEA (Annual Industry Accounts)	Index 2000=100
OA.26	Value added, ag., fishing, forestry	Mexico	INEGI	Pesos, 1993 prices
OA.27	Value added, mining	Mexico	INEGI	Pesos, 1993 prices
OA.28	Value added, manufacturing	Mexico	INEGI	Pesos, 1993 prices
OA.29	Value added, total	Mexico	INEGI	Pesos, 1993 prices
OA.30	Employees, total	Mexico	ILO (Lab. Survey)	1000 persons
OA.31	Employees, ISIC.r3 A	Mexico	ILO (Lab. Survey)	1000 persons
OA.32	Employees, ISIC.r3 B	Mexico	ILO (Lab. Survey)	1000 persons
OA.33	Employees, ISIC.r3 C	Mexico	ILO (Lab. Survey)	1000 persons
OA.34	Employees, ISIC.r3 D	Mexico	ILO (Lab. Survey)	1000 persons
OA.35	Employees, total	Mexico	ILO (Ins. Records)	1000 persons
OA.36	Employees, ISIC.r2 2-9	Mexico	ILO (Ins. Records)	1000 persons

OA.37	Employees, ISIC.r2 2	Mexico	ILO (Ins. Records)	1000 persons
OA.38	Employees, ISIC.r2 3	Mexico	ILO (Ins. Records)	1000 persons
OA.39	Population, 15-64	Mexico	WDI	Share of population
OA.40	Population, total	Mexico	WDI	1000 persons
OA.41	Consumption of fixed capital	Mexico	UN National Accounts	Bil Pesos
OA.42	GDP	Mexico	UN National Accounts	Bil Pesos
OA.43	Employment, total	Mexico	CDE	1000 persons
OA.44	Hours worked in manufacturing	Mexico	ILO	Hours/week/employee
OA.45	Hours worked	Mexico	BKKS	Hours per year
OA.46	Projected Population, total	US	UN WPP	1000 persons
OA.47	Projected Population, total	Mexico	UN WPP	1000 persons
OA.48	Projected Population, 18-65	US	UN WPP	1000 persons
OA.49	Projected Population, 18-65	Mexico	UN WPP	1000 persons

### Quarterly and Monthly Data

	Series	Country	Source	Unit
OQ.1	Net errors and omissions	Mexico	IFS - 27378CADZF...	Mil USD
OQ.2	Financial account, n.i.e.	Mexico	IFS - 27378BJDZF...	Mil USD
OQ.3	Direct inv. in rep. econ., n.i.e.	Mexico	IFS - 27378BEDZF...	Mil USD
OQ.4	Exchange rate, period avg.	Mexico	IFS - 273..AF.ZF...	Pesos/USD
OQ.5	Direct inv. in rep. econ., n.i.e.	Mexico	IFS	Bil Pesos
OM.1	3 Month T-bill rate	U.S.	IFS - 11160CS.ZF...	Percent per year
OM.2	Stripped spreads	Mexico	JP Morgan	Basis points

### Sources:

BKKS refers to data from Bergoing, R., P. J. Kehoe, T. J. Kehoe and R. Soto (2002), "A Decade Lost and Found: Mexico and Chile in the 1980s," *Review of Economic Dynamics*, 5(1), 166-205. The data is available at [www.econ.umn.edu/~tkehoe](http://www.econ.umn.edu/~tkehoe).

BEA refers to the United States Bureau of Economic Analysis website, <http://www.bea.gov/>.

CDE refers to the Organization for Economic Cooperation and Development's *Corporate Data Environment*, available at <http://www1.oecd.org/scripts/cde/>.

IFS refers to the International Monetary Fund's *International Financial Statistics* database.

ILO refers to data from the yearly data section of the International Labor Organization's LABORSTA database, available at <http://laborsta.ilo.org/>.

INEGI refers to data from the Instituto Nacional de Estadística Geografía y Informática, available at <http://dgcnesyp.inegi.gob.mx/bdiesi/bdie.html>.

JP Morgan refers to data from J.P. Morgan Securities Inc. *Emerging Markets Bond Index*.

OECD refers to the Organization for Economic Cooperation and Development's databases at [www.sourceoecd.org](http://www.sourceoecd.org). Data from SourceOECD National Accounts Statistics Volume II - Detailed Tables - Main Aggregates.

UN National Accounts refers to

United Nations (1994), *National Account Statistics: Main Aggregates and Detailed Tables, 1992, Part II*, New York: United Nations.

UN WPP refers to The United Nations *World Population Prospects*, 2006 edition, available online at <http://esa.un.org/unpp/>.

WDI refers to the World Bank's *World Development Indicators* CD-ROM.

### Constructed Data

	Series	Country	Unit
CA.1	Real GDP	Mexico	Pesos, 2000 prices
CA.2	Real investment	Mexico	Pesos, 2000 prices
CA.3	Real capital stock	Mexico	Pesos, 2000 prices
CA.4	Total hours worked	Mexico	Total hours per week
CA.5	Trade balance	Mexico	Share of GDP, percent
CA.6	Gross output deflator	Mexico	1993=1
CA.7	Gross output deflator, traded goods	Mexico	1993=1
CA.8	Gross output deflator	US	1993=1
CA.9	Gross output deflator, traded goods	US	1993=1
CA.10	log(RER)	Mexico-US	
CA.11	log(RERN)	Mexico- US	
CA.12	Traded good value added	Mexico	1994=100
CA.13	Nontraded good value added	Mexico	1994=100
CA.14	Employment, total	Mexico	1000 persons
CA.15	Employment, traded goods	Mexico	1000 persons
CA.16	Employment, traded goods	Mexico	Share of total employment
CA.17	Population, total	US	1000 persons
CA.18	Population, total	Mexico	1000 persons
CA.19	Population, 15-64	US	1000 persons
CA.20	Population, 15-64	Mexico	1000 persons
CA.21	Population, total	US	1988=1
CA.22	Population, total	Mexico	1988=1
CA.23	Population, 15-64	US	1988=1
CA.24	Population, 15-64	Mexico	1988=1
CQ.1	Non-FDI flows	Mexico	Share of GDP, percent
CM.1	Nominal rate	Mexico	Percent per year
CM.2	Stripped spreads	Mexico	Percent per year

#### Construction:

CA.1 is  $OA.1/OA.2 * 1,000,000$ .

CA.2 is  $(OA.3+OA.4)/OA.2 * 1,000,000$ .

CA.3 see notes on capital stock below.

CA.4 is  $(OA.44*OA.45)$  from 1991, and  $OA.46$  spliced onto  $(OA.44*OA.45)$  in 1998-1990.

CA.5 is  $(OA.5-OA.6)/OA.1 * 100$ .

CA.6 is  $OA.13/OA.17$ .

CA.7 is  $(OA.10+OA.11+OA.12)/(OA.14+OA.15+OA.16)$ .

CA.8 is  $OA.21/(OA.25*OA.21(2000))$ , normalized so that  $CA.8(1993) = 1$ .

CA.9 is  $(OA.18+OA.19+OA.20)/(OA.22*OA.18(2000)+OA.23*OA.19(2000)+OA.24*OA.20(2000))$ ,

normalized so that CA.9(1993) = 1.

CA.10 is  $\log(\text{OA.9} * \text{CA.8} / \text{CA.6})$ .

CA.11 is  $\log(\text{CA.7} * \text{CA.8} / (\text{CA.6} * \text{CA.9}))$ .

CA.12 is OA.26+OA.27+OA.28, normalized so that CA.12(1994) = 100.

CA.13 is (OA.29-OA.26-OA.27-OA.28) normalized so that CA.13(1994) = 100.

CA.14 is OA.35 spliced onto OA.30 in 1995.

CA.15 is ((OA.35-OA.36)+OA.37+OA.38) spliced onto (OA.31+OA.32+OA.33+OA.34) in 1995.

CA.16 is CA.15/CA.14.

CA.17 and CA.19 are linearly interpolated from OA.46 and OA.48.

CA.18 and CA.20 are linear interpolations of OA.47 and OA.49 spliced onto OA.40 and OA.40\*OA.39 in 2007.

CQ.1 is  $(\text{OQ.1} + \text{OQ.2} - \text{OQ.3}) / (\text{OQ.5} * 1,000 / \text{OQ.4}) * 100$ .

CM.1 is  $\text{OM.1} + \text{OM.2} / 100$ .

CM.2 is  $\text{OM.2} / 100$ .

### **Construction of Capital Stocks**

We construct capital stocks using the perpetual inventory method. We choose a value of the capital stock in 1950 and a value for the depreciation rate,  $\delta$ , and accumulate investment (CA.2) according to

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

We choose the initial capital stock and the depreciation rate so that the average capital output ratio from 1950-1959 is the same as the capital output ratio in 1950, and that the average amount of depreciation as a share of GDP,  $\delta K_t / Y_t$ , from 1982-1992 is that same as that in the data, (OA.41/OA.42) a value of 0.112.

## Input-Output Matrix

The input-output matrix used to calibrate the model so that it replicates the transactions that occurred in Mexico in 1988 is based on an unpublished 92-sector input-output matrix for 1989 obtained from the Instituto Nacional de Estadística Geografía y Informática. This matrix is transformed into the 2-sector input-output in the following steps in the worksheet "IO Matrix":

1. Matrix 1, the original input output matrix, is transformed into matrix 2, a matrix in which rows are aggregated, by summing sectors 1 through 79 to traded goods and 80 to 92 into nontraded goods.
2. Matrix 2 is transformed into matrix 3 by aggregating columns in the same way.
3. Matrix 3 is backdated to 1988 and rebalanced so that the row sum and column sums are equal in matrix 4. Data from the INEGI web site (<http://dgcnesyp.inegi.gob.mx/bdiesi/bdie.html>), which is in bold in the matrix is imposed for a number of variables. These data are reported in the worksheet "1988 Data." The matrix is balanced using the RAS method. (The classic reference for the RAS method is Stone 1961.) In fact, the worksheet itself can be used to do this balancing. Copy the 3×6 matrix under "input into RAS" into the matrix under "RAS" using Paste Special, Values. First the elements of the matrix are adjusted to yield the desired column sums in the matrix under "adjust to match column sums" and then the elements are readjusted to yield the desired row sums in the matrix under "adjust to match row sums." Notice that this latter step potentially makes the column sums wrong. Now copy the 3×6 matrix under "adjust to match row sums" into the matrix under "RAS" using Paste Special, Values. Iterate until convergence using CTRL Y.
4. Matrix 5 aggregates government consumption and private consumption columns of matrix 4 to match the concept of consumption used in the model and it similarly aggregates the gross fixed capital formation and inventory accumulation columns to form investment.
5. Matrix 6 removes tariffs, estimated using a 10 tariff rate, from the net taxes and subsidies row of matrix 5.
6. Matrix 7 puts imports into traded intermediate inputs and eliminates nontraded exports from table 6.
7. Matrix 8 aggregates net taxes and subsidies row minus tariffs into value added and imposes the aggregate capital share 0.38 on matrix 7.
8. Matrix 9 rebalances matrix 8 using the RAS method. Once again, the worksheet itself can be used to do this balancing.
9. Matrix 10 rescales the elements of matrix 9 so that GDP in 1988 is 100.

The worksheet "IO Matrix (no tariffs)" carries out all of these same steps but sets the tariff rate in step 6 equal to 0.

### Reference:

Stone, R. A. (1961), *Input-Output Accounts and National Accounts*, Organisation for European Economic Cooperation.