Economic preprocessor

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There are 74 series read into the economic preprocessor. Most of them come from World Development Indicators (WDI). There are quite a few series marked as "IMF GFS 2013 BATCH PULL". There are a lot of data on the informal economy from ILO-WIEGO. Cyber data also appears to be read into DataEcon.

☐

Contents

Output
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Sources

- IMF
- ILO
- WDI
- Global Trade Analysis Project (GTAP)
- OECD_Factbook

Economic series used in preprocessor

DataDict

Table	Source	Last IFs Update	UsedInPreprocessorFileName
SeriesGDPInformal%Elgin	Available at: http://www.econ.boun.edu.tr/public_html/RePEc/pdf/201205.pdf	2014/04/04	ECON
SeriesGDP2003PPP	CIA (original partly World Bank); extended by Evan Hillebrand	2004/07	ECON
SeriesGovtPension%GDP	Data was processed from World Bank's pensions site.	2013/07/22	ECON
SeriesLaborInformalFemale%FormalSec	ILO-WIEGO	2015/03/10	ECON
SeriesLaborInformalFemale%HHInformal	ILO-WIEGO	2015/03/10	ECON
SeriesLaborInformalMale%InformalSec	ILO-WIEGO	2015/03/10	ECON
SeriesLaborInformalFemale%InformalSec	ILO-WIEGO	2015/03/10	ECON
SeriesLaborInformalFormSec%TotalInformal	ILO-WIEGO	2015/03/10	ECON
SeriesLaborInformalHH%TotalInformal	ILO-WIEGO	2015/03/10	ECON
SeriesLaborInformalInfSec%TotalInformal	ILO-WIEGO	2015/03/10	ECON
SeriesLaborInformalMale%FormalSec	ILO-WIEGO	2015/03/10	ECON
SeriesLaborInformalMale%HHInformal	ILO-WIEGO	2015/03/10	ECON
SeriesGovtCalcRevTot%GDP	IMF GFS 2013 BATCH PULL	2013/12/20	ECON
SeriesGovtCalcRevCen%GDP	IMF GFS 2013 BATCH PULL	2013/12/20	ECON
SeriesGovtCalcExpendTot%GDP	IMF GFS 2013 BATCH PULL	2013/12/20	ECON
SeriesGovtCalcExpendCen%GDP	IMF GFS 2013 BATCH PULL	2013/12/20	ECON
SeriesTaxCorp%Tot	IMF Government Finance Statistics (2001)	2013/09/04	ECON
SeriesVaddICT%GDP	Information Society Statistics Pocketbook 2001		ECON
SeriesGovTotalOutlays%GDP	OECD_Statistics_Database_Online	2016/04/10	ECON
SeriesGDPInformal%Blended	UNECE, "Non-Observed Economy in National Accounts: Survey of Country Practices"; http://rru.worldbank.org/Documents/PapersLinks/informal_economy.pdf; http://www.econ.boun.edu.tr/public_html/RePEc/pdf/201205.pdf	2015/01/13	ECON
SeriesAidDon%GNI	United Nations Statistics Division	2013/12/09	ECON
SeriesXPortEquity%GDP	WDI BATCH PULL	2017/03/29	ECON
SeriesXReserves%GDP	WDI BATCH PULL	2017/03/29	ECON
SeriesHouseCon%GDP	WDI BATCH PULL	2015/07/14	ECON
SeriesVaddInd%	WDI BATCH PULL	2015/07/15	ECON
SeriesArmsImp%TotImp	WDI BATCH PULL	2015/07/14	ECON
SeriesGovtCurRev%GDP	WDI BATCH PULL	2015/07/14	ECON
SeriesGovtDebt%GDP	WDI BATCH PULL	2015/07/14	ECON
SeriesVaddMan%	WDI BATCH PULL	2015/07/15	ECON
SeriesExportsMerchandise	WDI BATCH PULL	2015/07/14	ECON
SeriesXDebtPPG%GDP	WDI BATCH PULL	2015/07/15	ECON
SeriesXPortBonds%GDP	WDI BATCH PULL	2015/07/15	ECON
SeriesXIncPayments%GDP	WDI BATCH PULL	2017/03/29	ECON
SeriesXFlowsIDA%GDP	WDI BATCH PULL	2015/07/15	ECON
SeriesXIMFCredit%GDP	WDI BATCH PULL	2015/07/15	ECON
SeriesXFlowsIMFNonCon%GDP	WDI BATCH PULL	2015/07/15	ECON
SeriesXWorkerRemitPaid	WDI BATCH PULL	2017/03/29	ECON
SeriesAidRecGrant%Total	WDI BATCH PULL	2015/07/14	ECON

SeriesXDebtPNG%GDP	WDI BATCH PULL		2015/07/15	ECON
SeriesXFDIInflows%GDP	WDI BATCH PULL		2017/03/29	ECON
SeriesVaddSer%	WDI BATCH PULL		2015/07/15	ECON
SeriesExportServices	WDI BATCH PULL		2017/03/29	ECON
SeriesXIncReceipts%GDP	WDI BATCH PULL		2017/03/29	ECON
SeriesExportGoodSer%	WDI BATCH PULL		2015/07/15	ECON
SeriesTaxSocSec%CurRev	WDI BATCH PULL		2015/07/15	ECON
SeriesTaxGoodSer%CurRev	WDI BATCH PULL		2015/07/15	ECON
SeriesXCurActBal%GDP	WDI BATCH PULL		2017/03/29	ECON
SeriesXDebt	WDI BATCH PULL		2015/07/15	ECON
SeriesXFlowsIMFCon%GDP	WDI BATCH PULL		2015/07/15	ECON
SeriesXFDIOutflows%GDP	WDI BATCH PULL		2017/03/29	ECON
SeriesVaddAg%	WDI BATCH PULL		2015/07/15	ECON
SeriesXFlowsIBRD%GDP	WDI BATCH PULL		2015/07/15	ECON
SeriesImportsMerchandise	WDI BATCH PULL		2015/07/14	ECON
SeriesImportServices	WDI BATCH PULL		2017/03/29	ECON
SeriesImportGoodSer%	WDI BATCH PULL		2015/07/14	ECON
SeriesGovExpense%GDP	WDI BATCH PULL		2015/07/14	ECON
SeriesGovCon%GDP	WDI BATCH PULL		2015/07/14	ECON
SeriesXWBLoans%GDP	WDI BATCH PULL		2015/07/15	ECON
SeriesAidRec%GNI	WDI BATCH PULL		2017/03/29	ECON
SeriesXWorkerRemitReceived	WDI BATCH PULL		2017/03/29	ECON
SeriesGiniExtended	WDI World Bank, Klaus Deininger 202-473-0430 and Lyu Squire 202-473-6099; plus WDI CD 2002 for 1997-2000; plus WD 2002; plus UNDP HDR 2005; WDI 2008; WDI 2011		2015/03/17	ECON
SeriesGovSSWelBen%Exp	WDI 2011		2011/12/22	ECON
SeriesICTExport%Exp	WDI 2013		2013/11/08	ECON
SeriesICTImport%Imp	WDI 2013		2013/11/08	ECON
SeriesGDP2005PCPPP	WDI 2013; extrapolated based on previous GDP_PCPPP2005 values in IFs; extrapolated based on CIA Factbook; taken directly from CIA Factbook; taken directly from previous GDP_PCPPP2005 values in IFs		2013/12/23	ECON
SeriesGDP2011PCPPP	WDI 2017		2017/03/29	ECON
SeriesPovertyGap$1c90perDay	WDI 2015		2015/12/03	ECON
SeriesIncBelow1D90c%WDI	WDI 2015		2015/11/04	ECON
SeriesIncBelow3D10c%WDI	WDI 2015		2015/11/04	ECON
SeriesIncBelow2Dollar%WDI2011	WDI 2015 BATCH PULL		2015/07/22	ECON
SeriesPopForeign%	WDI 2015 BATCH PULL		2015/07/22	ECON
SeriesOresMetsEx%MerchEx	WDI 2015 BATCH PULL		2015/07/22	ECON
SeriesIncShareL20%	WDI 2015 BATCH PULL		2015/07/22	ECON
SeriesInvestGrCapForm%GDP	WDI 2015 BATCH PULL		2015/07/22	ECON
SeriesOresMetsIm%MerchIm	WDI 2015 BATCH PULL		2015/07/22	ECON

Initializations

Use government consumption and expenditures data to initialize SAM.

Government consumption

- Government consumption (CGovCon) is initialized using **SeriesGovCon%GDP.**
  - **Source:** WDI
  - **Definition:** Government (general) final consumption as % of GDP
  - **Country coverage:** 182 countries
  - Source definition:"General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation"
  - **If null:** "GDP/Capita (PPP) Versus Govt Cons % GDP (" & CStr(BaseYear) & ")"
  - **This uses the equation:** GDP/Capita (PPP) Versus Govt Cons % GDP (2000)

- CGConFromSectors = GExpDef(ICount%) + GExpEd(ICount%) + GExpRandD(ICount%) + GExpHl(ICount%) + GExpInfra(ICount%) + GExpInfraOther(ICount%)
    - Government consumption by sector is initialized in the government consumption preprocessor (DataGovCon).
- Set CGovCon as the max of CGovCon and the CGovCon calculated as the sum of sectors. Bound between 9 and 35.

Government expenditures

Initialize central government expenditures and total government expenditures and then calculate local government expenditures as the difference.

- Central government expenditures (GovExpCentral) is initialized using **SeriesGovExpense%GDP**
    - **Source:** WDI
    - **Definition:** Government expense as % of GDP (compare with govt expenditures)
- If null then use **SeriesGovtCalcExpendCen%GDP**
- **If still null then use:** "GDP/Capita (PPP 2005) Versus Govt Expense % GDP (" & CStr(BaseYear) & ") Log"
- **This equation uses:** GDP/Capita (PPP 2005) Versus Govt Expense % GDP (2010) Log
- **Note:** IMF series (GovtCalcExpendCen%GDP) appears to be central government expenditures while the WDI series does not specify.

- Use **SeriesGovtCalcExpendTot%GDP** to initialize **total** government expenditures.
    - **Source:** IMF GFS
    - **Definition:** Expenditure, government, total, as % of GDP
- If null, then use **SeriesGovTotalOutlays%GDP**
    - **Source:** OECD Statistics Database Online
    - **Definition:** Government total outlays (% of GDP), including forecast
- *Note: Must make sure these two series are identical*
- Hard code 46 in for Ireland in 2010 because of bailout.

- If no data on total expenditures still, then we cannot estimate local so we use this equation:

      If IsNull(CGovTotExp) Then
          CGovExpLocal(ICount%) = 2 + 12 * Amin(20, CGDPPCP(ICount%)) / 20
      Else
          CGovExpLocal(ICount%) = AMAX(1, CGovTotExp - GovExpCentral)
      End If

'   Go to total govt expenditures and filling holes when have data in order to compute local govt

'   When do not have total and therefore ability to compute local govt,
'   estimate at 2-14% of GDP (OECD gap between total and central is 14%)
'   North, Walli, Weingast p. 10 have table showing grows from 1-2% to 16%

- CGovExp(ICount%) = GovExpCentral + CGovExpLocal(ICount%) 'Add Central plus local to get total

Government revenue

- Central government revenue (GovRevCen) is initialized using **SeriesGovtCurRev%GDP**
    - **Source:** WDI
    - **Definition:** Current government revenue as % of GDP
    - **Extended definition:** blended with old Ifs data. Revenue is cash receipts from taxes, social contributions, and other revenues such as fines, fees, rent, and income from property or sales. Grants are also considered as revenue but are excluded here.
- If it's null or less than 5 then we use GDP per capita to estimate.
    - **To fill holes:** "GDP/Capita (PPP) Versus Govt Revenue (" & CStr(BaseYear) & ")"
    - **This equation uses:** GDP/Capita (PPP) Versus Govt Revenue (2000)

- Total government revenue (GovRevTot) is initialized using **SeriesGovtCalcRevTot%GDP**
    - **Source:** IMF GFS
    - **Definition:** Revenue, government, total, as % of GDP
- If GovRevTot is null i.e. there is no data for total government revenue for the country in SeriesGovtCalcRevTot%GDP (or the value is less than 5) then esimate using GDP per capita (2005).
    - **To fill holes:** "GDP/Capita (PPP 2005) Versus Govt Revenue Total (2010) Log"
- Then set GovRevTot as the max of total government revenues and central government revenues
- Cap total government revenues at 75
- Set local government revenue as the difference between total and central
- ***Note:****This logic creates problems for countries where there is not a total government revenue data point but there is a central government data point (ex. Malawi). In this case, both total government revenue and central government revenue are initialized as the data value for central government revenue and local government revenue is set at zero (the difference between total and central).*

- Firm tax rate (CFirmTaxR) is initialized using **SeriesTaxCorp%Tot**
    - **Source:** IMF Government Finance Statistics (2001)
    - **Definition:** Corporate taxes as percent of total central government revenue
    - ***Note:*** *Apparently not part of batch pull.*
- **To fill holes:**"GDP/Capita (PPP) Versus Corporate Tax % of Total (" & CStr(BaseYear) & ")"
    - **This equation uses:** GDP/Capita (PPP) Versus Corporate Tax % of Total (2000)

- Social security tax (CSSWelTaxR) is initialized using **SeriesTaxSocSec%CurRev**
  - **Source:** WDI
  - **Definition:** Social security taxes as % of total govt revenue
- **To fill holes:** "GDP/Capita (PPP) Versus SS Tax % of Total (" & CStr(BaseYear) & ")"
  - **This equation uses:** GDP/Capita (PPP) Versus SS Tax % of Total (2000)

- Indirect taxes (CIndirectTaxR) is initialized using **SeriesTaxGoodSer%CurRev**
  - **Source:** WDI
  - **Definition:** Taxes on goods and services as % of total govt revenue
- **To fill holes:** "GDP/Capita (PPP) Versus Indirect Tax % of Total (" & CStr(BaseYear) & ")"
  - **This equation uses:** GDP/Capita (PPP) Versus Indirect Tax % of Total (2000)

- Household taxes (CHHTaxR) estimated as residual from firm, welfare, and indirect taxes

Transfers

- CGovSSWel is initialized using **SeriesGovSSWelBen%Exp**
  - **Source:** WDI
  - **Definition:** Government Social Security and welfare expenditures as % of total expenditures
  - ***Note:*** *Not included in last WDI batch pull*
- **To fill holes:** "GDP/Capita (PPP 2005) Versus Govt Expense % GDP (" & CStr(BaseYear) & ") Log"
  - **This equation uses:** GDP/Capita (PPP 2005) Versus Govt Expense % GDP (2010) Log
  - **Note:** This appears to use a government expense equation to estimate SS and welfare.

Reconciliation

'   Govcon+SSWEL=GOVEXP; give priority first to boosting Govcon, then reducing sswel, then boosting Govexp
        'i.e. protext all of govcon and boost if possible; reduce sswel as needed; reduce govexp after sswel

Pensions

- Government pensions (CGovHHPenT) are initalized using **SeriesGovtPension%GDP**
  - **Source:** Data was processed from World Bank's pensions site.
  - **Extended source:** "International Patterns of Pension Provision" by Palacios and Pallares-Miralles, 2000; OECD Social Expenditure Database. World Bank Pensions Performance Indicators Q2, 2013.
  - **Definition:** Government (public) pensions as % of GDP

- - **Note:** *Newer pension data exists in IFs but is not pulled into preprocessor*
- **To fill holes:** "GDP/Capita (PPP) Versus Public Pension % of GDP (" & CStr(BaseYear) & ")"
  - **This equation uses:** GDP/Capita (PPP) Versus Public Pension % of GDP (2000)

Reconcile with trade

Normalize Expenditure Components to 100% - (X-M)

Split into sectors

Government consumption

```
'   Split Government Consumption and Investment into Sectors of Origin
'   ---------------------------------------------------------------

    For ICount% = 1 To CCount
         GMN(ICount%) = 0.1 * CGCon(ICount%) 'Manufacturing spending assumed to be
10% of conumption
         GSR(ICount%) = 0.9 * CGCon(ICount%) 'Services spending assumed to be 90% of
consumption
         IMN(ICount%) = CINVEST(ICount%) * 0.5 'Manufacturing investment assumed to be
50% of investment
         ISR(ICount%) = CINVEST(ICount%) * 0.5 'Services investment assumed to be 50%
of investment
    Next ICount%
```

Personal consumption

```
'   Split Personal Consumption into Sectors - Use Value Added and AMAT
'   ---------------------------------------------------------------
```

- Use AMAT data to initalize personal consumption for agriculture, manufacturing, and services.
- Adjust personal energy consumption based on world energy price and energy exports (exporters tend to consume more).
- Initalize ICT personal consumption using ICTShare
- Normalize with total consumption.

Social Accounting Matrix

'   Social Accounting Matrix Stocks. Begin with Stocks because some needed for flows

Stocks

IFI

- World Bank (CXWBLOANS) is initialized using **SeriesXWBLoans%GDP.**
- **Source:** WDI Batch Pull
- **Definiton:**IBRD loans and IDA credits as % of GDP
- **Notes:** mjs: Data is transformed to percent of gdp using current us$ GDP; MJE

- IMF loans (CXIMFCREDIT) are initialized using **SeriesXIMFCredit%GDP.**
  - **Source:** WDI Batch pull
  - **Definiton:** IMF credits as % of GDP
  - **Notes:** mjs: Data is transformed to percent of gdp using current us$ GDP; MJE

- '   Allocate World Bank Loans to Advanced Countries

Allocate total World Bank loans to "advanced countries" (countries with GDP per capita over 10,000 USD and no World Bank loans) based on size of economy. Use one countries share of the total GDP of all advanced countries to determine the share of total WB debt that they lend.

    PerCap = CGDP(ICount%) / CPop(ICount%)
    If PerCap > 10 And CXWBLOANS(ICount%) <= 0.001 Then
        CXWBLOANS(ICount%) = -CGDP(ICount%) / AdvGDPXWBDebt * (GloXWBDebt /
AMAX(1, sxwblneqr))
        End If

- Do the same for IMF debt.

Debt

- Initialize public and private guarenteed debt (PPGDEBT) using **SeriesXDEBTPPG%GDP**
  - **Source:** WDI Batch Pull
  - **Definition:** External debt, public and publicly guaranteed, as percentage of gross domestic product

- Initialize external debt (private non-guarenteed) (PNGDEBT) using **SeriesXDEBTPNG%GDP**
  - **Source:** WDI Batch pull
  - **Definition:** External debt, private non-guaranteed, as percentage of gross domestic product

- Assume firm debt (CXFIRMDEBT) is half of the sum of public and private guarenteed and private non-guarenteed.

  CXFIRMDEBT(ICount%) = PNGDEBT + PPGDEBT * 0.5
  'Need to break PPGDEBT better between private/governmental
  'Probably poorest countries have highest govt share

- Allocate external firm debt to advanced countries using same procedure for IMF and WB debt above

- Integrate Debt Caculation Using Current Account Data
  - This basically calculates annual exports, imports, and aid for 1960 to 2010 and sums into cumulative debt.

- Initialize external debt (CXDEBTRPA) using **SeriesXDEBT**
  - **Source:** WDI Batch Pull
  - **Definition:** External long-term (more than 1 year) debt: public, publically guaranteed and priv nonguarantee

- '   Augment External Debt Data with Current Account Accummulation and Compute Global Balance
- If there is no data for CXDEBTRPA then use the cumulative sum calculated from current account above.
- Make sure that debt is at least as big as the sum of WB, IMF, and private debt calculated above.
- Make sure that assets are at least as big as WB donations IMF donations, and private assets.
- 'Assume debt data better than asset and impose on assets - Scale each lender countries assets to align with global debt
- '   Compute governmental external debt and government domestic debt - set government debt (CXGOVTDEBT) to total debt (CXDEBTRPA) minus firm debt (CXFIRMDEBT). This assumes that there is no household external debt.
- Set "basic" government debt (CXGOVTDEBTB) as total government debt (CXGOVTDEBT) minus IFI debt (to WB and IMF).

Aid

- Initalize aid donations (CAIDDON) using **SeriesAidDon%GNI**
  - **Source:** United Nations Statistics Division
  - **Original source:** OECD
  - **Definition:** Aid donations as percent of GNI

- Initialize aid received (CAIDREC) using **SeriesAIDRec%GNI**

- **Source:** WDI Batch Pull
- **Original Source:** Development Assistance Committee of the Organization for Economic Co-operation and Development, and World Bank and OECD GNI estimates.
- **Definition:** Official development assistance and official aid, net, % of GNI
- **Extended source definition:**
  http://databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=2

- Initialize CAIDSHARE using **SeriesAidRecGrant%Total**
  - **Source:** WDI Batch Pull
  - **Original source:** Development Assistance Committee of the Organization for Economic Co-operation and Development, and World Bank and OECD GNI estimates.
  - **Definition:** Official development assistance and official aid, grants and other revenue, current LCU
  - ***Note:*** *Unsure where this is actually used*
- ' Normalize Aid Receipts and Donations so Global Sums Match

Government Debt

- Initalize government debt (CGOVDEBT) using**SeriesGovtDebt%GDP**
  - **Source:** WDI Batch Pull
  - **Definition:** Central government debt as % of GDP
- If it's null use GDP per capita i.e. the equation: "GDP/Capita (PPP) Versus Govt Debt % GDP (" & CStr(BaseYear) & ")" to estimate.
  - This equation uses: GDP/Capita (PPP) Versus Govt Debt % GDP (2000)
- Set CGovDebt as the max of external government debt (CXGOVTDEBT) and central government debt (CGOVDEBT).

Reserves

- Initialize government reserves (CXRESERVES) using **SeriesXReserves%GDP**
- If null, set to 15.

FDI

- Initialize FDI inflows as a stock using the sum of inflows over past 30 years from **SeriesXFDIInflows%GDP**
- Initialize FDI outflows as a stock using the sum of outflows over the past 30 years from **SeriesXFDIOutflows%GDP**
- ' Read Bonds and Equity and Calculate Annual Portfolio Inflows - Take the average of bonds and equity for the past 5 years, set as CXPORTFIN
- Make sure FDI no bigger than 5% of GDP

If Not (IsNull(GDPANN)) Then 'Luxembourg rule; flows far too big for addition to firm income
'This is probably too big a cut for Hong Kong; may need more sophisticated algorithm
'for entrepot economies
CXPORTFIN(ICount%) = Amin(CXPORTFIN(ICount%), 0.05 * GDPANN)
End If

Flows

IFI

' Read WB Net Flows and Estimate Outflows and Inflows
' Must do after stocks because need CXWBLOANS

- Estimate using average of last 5 years of inflows. Balance inflows and outflows so that they match.
- The initialization of World Bank outflows (CXWBLNFOUT) requires World Bank loans (out) as a stock (CXWBLOANS). CXWBLNFOUT is initalized using the equation below, which also uses (sxwblnintr) and (sxwblnrepr).
  - **Note:** *Unsure of exactlty what these global parameters (sxwblnintr and sxwblnrepr) are.*

    CXWBLNFOUT(ICount%) = (CXWBLOANS(ICount%) * sxwblnintr / 100 _
    + CXWBLOANS(ICount%) / AMAX(1, sxwblnrepr))

' Read IMF Net Flows and Estimate Outflows and Inflows
' Must do after stocks because need CXIMFCREDIT

- Same as World Bank above - use the average of the past 5 years for inflows. Use the following equation for outflows, which requires outgoing stocks, initialized above.

  CXIMFCRFOUT(ICount%) = (CXIMFCREDIT(ICount%) * sximfcrintr / 100 _
  + CXIMFCREDIT(ICount%) / AMAX(1, sximfcrrepr))

Remittances

- Initialize outgoing remittances using **SeriesXWorkerRemitPaid** and incoming remittances using **SeriesXWorkerRemitReceived.** Normalize each country's paid and received using RemitNormReceived and RemitNormPaid, normalizing coefficient calculated elsewhere.
  - **Note:** *I think this is normalize total paid and received i.e. total outflows for all countries and total inflows for all countries. The global balance below is to balance NET inflows and outflows.*
- ' Balance Global Remittances
  - Make sure global paid remittances equal global recieved remittances.
- ' Fill holes on CPOPFOREIGN and fix descrepancies

- If there is a foreign population and remittances are greater than zero, change the sign of foreign population (CPOPFOREIGN).

'jrs 2014/02/04 better to re-initialize CPOPFOREIGN which is an estimate
'and not CXWORKREMIT, which comes from data

'This assumes $1,000 annual remitances per person, which is the average from the US and EU27

- 'Bound remittances at $5,000 per worker abroad

Balancing

- ' ReBalance Global Remittances
- 'Normalizing Immigrants and Emmigrants again, in case they were adjusted by Remittances
- ' Balance global migration stocks, inward and outward
- ' Normalize World Bank Flows in and out
- ' Normalize IMF Flows in and out
- 'bbh 2011/11/12 Adjusted this allocation because above now have new outflow countries also
  - ' Allocate Portfolio Investment to Advanced Countries by Economic Size
- ' Balance Portfolio Stocks in and Out; Adjust Stocks Out
- ' Compute Porfolio Flows Out
- '*Balance Portfolio Flows in and Out; Adjust Outflows*
- ' Balance FDI Stocks with Adjustments to Advanced Countries
- ' Balance FDI Flows with Adjustments to Advanced Countries
- ' Compute Apparent Reconciliaton of Capital and Current Account in Recent Years using accumulation of government debt and change in reserves
- Calculate how much debt has grown from 97/98 to 99/00. Then calculate how much reserves have grown from 97/98 to 99/00. Then calculate the ratio of reserves growth to debt growth.
  - '   Compute unreconciled discrepancy between capital and current account
    - Reasons could be flight capital, unreported worker remittances, other data errors
- Initialize foreign income payments using **SeriesXIncPayments%GDP** and foreign income receipts using **SeriesXIncReceipts%GDP.**
- ' ReBalance Global Remittances Still Again

Household and firm income

'   Now that have tax rates as % of govt revenue
'   and have intl financial flows that affect firm income in forecasts,
'   can compute household and firm income, adjust firm by intl flows and

Output

- Put everything into EcoOutput
- ' Go to specialized routines to process input-output data for IFs
  - Call InputOutputDataAdjuster
  - Call RegionalInputOutputData

Recompute

- Sub RecomputeAgriOutput()
  - 'Because of the different normalizations XAG has suffered, it no longer matches the SUM of AgXValues
- Sub RecomputeOutputAgriNormalization

GDP

- ' Fill Initial GDP Growth Rates and Income Distribution Measures
  - [incomplete]

SeriesGDP2011

Note: this covers the calculation of GDP at constant 2011 US dollars for 183 IFs countries. The excluded countries are Syria, Somalia, and North Korea.

Data Source

1. GDP at current US$, 1960-2018

https://data.worldbank.org/indicator/NY.GDP.MKTP.CD ,

the World Bank

2. Real GDP annual growth (% change), 1960-2018

https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG,

The World Bank

3. Real GDP annual growth (% change), 1980-2024

https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/OEMDC/ADVEC/WEOWORLD,

The International Monetary Fund

Calculation Steps

1. Take GDP values from current US$ data for each country in 2011, do the country concordance and unit conversion (GDP in IFs is in Billion US$). The GDP at current US$ in year 2011 for each country equals to that country's GDP at constant 2011 US$. So now we have a data that has each country's GDP at constant 2011 US$ in year 2011, in billion US dollars, in IFs country name format.

2. Use the above data as our base year, then use the GDP annual growth rate to fill forward (2011 to 2024) & backwards (2011 to 1960) each country's GDP for all years. During the calculation, the growth rate from WDI should serve as our primary source while the IMF growth rate would serve as the supplemental source, i.e., whenever there is a missing value in WDI's growth rate, we will then rely on IMF's growth rate. After this step, we will then have a full dataset of GDP at constant 2011 US billion dollars, expect Syria, Somalia, and North Korea.