



World Economic Forecasting Model: A Progress Report

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United Nations

Overview



1. Where we are with the WEFM

- Background
- Large Model
- Small Model
- (new) Oil country model
- (new) Global Model
- (New) Single Country Model Interface
- (todo) Global Model Interface

2. WESP2015

- Downside scenario

3. Future work

- Re-estimate large model



1. Where Are We

Background

- **WEFM contains 31 Large models (3 Developing country) and 121 small models all linked together in global linkage framework (152 total)**
- **Suite of macros: Single Country + Global**
- **Model in use since 2010-Spring**
- **Produced 10 forecasts and some scenarios**
 - ⇒ **Oil price**
 - ⇒ **Fiscal expansion**
 - ⇒ **Euro area crisis**
 - ⇒ **US fiscal cliff**
 - ⇒ **China hard landing**

The Large Model



- **New Keynesian flavour**
- **Supply side: neoclassical long-run**
- **Keynesian demand side short-run (rigidities)**
- **Accounting system links Households, Government, Firms, and RoW**
- **Estimated using Cointegration/Error Correction framework in single equation Engle/Granger approach**

The Large Model (2)



- **Single-country estimation: Japan, France, USA and Great Britain**
- **“Replicated” models: rest of OECD (and a few developing countries)**
- **Freeze slope coefs and re-estimate constant terms**
- **Used for 25 country forecasts**
- **Only need 4-5 time contiguous observations for all variables**
- **Typical data missing: Labour market and/or Household and Government balance sheet tables**
- **Can use directly or as a starting point for estimation**
- **Have not made any changes since Jan 2012**

The Small Model



- **Minimum size model that is still useful**
- **Fills out global model-system: 150+ individual country models**
- **Data requirement: Expenditure table + Inflation variable(CPI) + Labour market**
- **Simple consumption, investment, export and import equations, employment and labour force.**
- **Error correction/Cointegration framework**
- **Simplified supply side with Cobb/Douglas (type) production function with technical progress**
- **Demand equations contain supply constraints directly**
- **Some “devices” added to give models more flavour**

The Small Model (2)



In 2012:

- **Added labour demand/supply equations using the KILM data bank from the ILO**
- **Changed the supply side**
 - ⇒ **$Y=f(K,t)$ with technical progress as Holt-Winters smoothed residuals.**
 - ⇒ **$Y=f(K,L,t)$ with HP filter smoothed residuals.**
- **Estimation changes: From “Replicated” models to Panel estimation. Now use panels, by major region, for all small models.**

The Small Model (3)



In 2014:

- **Created new Oil producer (dominated) country model**
⇒ **Before some switches in the small model**
- **Estimate as a panel with all oil producers together, remove these countries from regional panels, and re-estimate regional panels as non-oil countries only**



The Global Model

- **152 Countries country models linked through trade in goods & non-factor services via a trade flow matrix**
- **Linkages:**
 - ⇒ **Imports of country j are allocated to all of its trade partners**
 - ⇒ **Exports of country k are the sum of all its exports to other countries**
 - ⇒ **Weighted average of partner country export prices equals home country import price.**
 - ⇒ **Country export prices are determined as weighted average of “competitors” price and domestic price**
 - ⇒ **Exchange rates, some interest rates, commodity prices**
- **(New) Competitors price determined endogenously.**
- **(New) Single EViews model**



The Global Model - linkages

$$X_{kj} = S_{kj} * M_j$$

$$\sum_J X_{kj} = X_k$$

$$PX_k = f(PY_k, CXD_k)$$

$$XR_{kJ} = X_{kj}/PX_k$$

$$MR_J = \sum_K XR_{kJ}$$

$$PM_J = M_J / MR_J$$

$$CXD_k = \sum_J X_{iJ}/X_i (\sum_K M_{jK}/M_j PX_k)$$

Where:

M_j = total nominal imports/exports of country j

S_{kj} = the share of country k in imports of country j

X_{kj} = exports of country j to country k = imports of country k from country j

Macros/Interface



- (New) Single country simulator
- (To do) Global model simulator



2. WESP2015 Scenario

Use WEFM to produce downside scenario

1) Euro area renewed crisis

- Trade shock from Ukraine troubles and sanctions**
- Confidence shock**
- Risk premia up**

3) US FX appreciation

4) EM countries slow further

May add

5) POIL (and commodity prices) decline more

	2014	2015	2016	2017	2018	2019	2020
EMU_PCR							
EMU_D3d	4,737.94	4,764.65	4,798.87	4,877.07	4,960.84	5,054.21	5,155.51
Baseline	4,751.45	4,803.98	4,860.90	4,930.15	5,004.92	5,088.24	5,178.41
Deviation	-13.51	-39.33	-62.03	-53.08	-44.08	-34.03	-22.90
% Deviation	-0.28	-0.82	-1.28	-1.08	-0.88	-0.67	-0.44
EMU_ITR							
EMU_D3d	1,581.94	1,609.13	1,649.23	1,703.12	1,767.44	1,836.85	1,907.90
Baseline	1,586.48	1,625.05	1,677.58	1,735.34	1,797.23	1,859.75	1,921.05
Deviation	-4.54	-15.91	-28.35	-32.22	-29.79	-22.90	-13.15
% Deviation	-0.29	-0.98	-1.69	-1.86	-1.66	-1.23	-0.68
EMU_XTR							
EMU_D3d	3,820.77	4,020.39	4,181.58	4,344.02	4,521.74	4,711.22	4,909.40
Baseline	3,826.03	3,998.14	4,186.43	4,369.34	4,556.86	4,747.38	4,940.68
Deviation	-5.25	22.25	-4.85	-25.32	-35.12	-36.16	-31.28
% Deviation	-0.14	0.56	-0.12	-0.58	-0.77	-0.76	-0.63
EMU_MTR							
EMU_D3d	3,426.97	3,580.07	3,720.47	3,872.38	4,045.60	4,231.17	4,422.39
Baseline	3,430.77	3,589.15	3,759.97	3,930.10	4,108.92	4,291.62	4,475.37
Deviation	-3.81	-9.08	-39.50	-57.71	-63.32	-60.46	-52.98
% Deviation	-0.11	-0.25	-1.05	-1.47	-1.54	-1.41	-1.18
EMU_YER							
EMU_D3d	8,502.82	8,608.84	8,732.20	8,900.19	9,094.62	9,302.12	9,520.41
Baseline	8,522.33	8,636.37	8,790.07	8,958.75	9,141.64	9,331.02	9,527.15
Deviation	-19.52	-27.52	-57.87	-58.56	-47.01	-28.90	-6.74
% Deviation	-0.23	-0.32	-0.66	-0.65	-0.51	-0.31	-0.07
EMU_HIC							
EMU_D3d	1.26	1.27	1.29	1.31	1.34	1.36	1.38
Baseline	1.26	1.27	1.29	1.32	1.34	1.36	1.39
Deviation	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
% Deviation	-0.03	-0.02	-0.05	-0.11	-0.19	-0.28	-0.34
EMU_CANRATIO							
EMU_D3d	3.32	2.26	1.77	1.47	1.33	1.27	1.10
Baseline	3.33	2.21	1.61	1.29	1.18	1.16	1.04
Deviation	-0.00	0.05	0.16	0.18	0.15	0.11	0.06
% Deviation	-0.07	2.40	9.96	13.93	12.96	9.53	6.22
EMU_EXR							
EMU_D3d	0.75	0.83	0.85	0.86	0.86	0.86	0.86
Baseline	0.75	0.80	0.83	0.83	0.83	0.83	0.83
Deviation	-0.00	0.02	0.02	0.02	0.02	0.03	0.03
% Deviation	-0.03	3.00	2.98	2.95	2.96	3.03	3.21
EMU_STI							
EMU_D3d	0.19	0.08	0.33	1.94	3.85	3.75	3.69
Baseline	0.22	0.10	0.38	2.05	4.05	4.04	4.04
Deviation	-0.03	-0.02	-0.05	-0.11	-0.20	-0.29	-0.35
% Deviation	-13.02	-22.61	-12.71	-5.45	-4.88	-7.14	-8.68
EMU_GLNRRATIO							
EMU_D3d	-2.54	-2.15	-1.65	-1.44	-1.26	-0.98	-0.78
Baseline	-2.52	-2.09	-1.55	-1.34	-1.18	-0.97	-0.84
Deviation	-0.03	-0.06	-0.10	-0.10	-0.08	-0.01	0.06
% Deviation	1.02	2.94	6.64	7.44	6.36	1.44	-6.99
EMU_URX							
EMU_D3d	11.63	11.44	11.04	10.66	10.28	10.04	9.83
Baseline	11.59	11.35	10.87	10.46	10.10	9.89	9.74
Deviation	0.04	0.10	0.16	0.20	0.18	0.15	0.09
% Deviation	0.35	0.84	1.50	1.92	1.81	1.47	0.90



3. Future Work

- **New large model: Panel estimation but allow for heterogeneity**
- **Improve interface: Single country and Global**
- **Documentation**
- **Further training programs and joint work**