EMU, Trade and

Business Cycle Synchronization

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Economic Costs of EMU seem Clear, Large

- Primary: *Loss of ability to stabilize business cycles* with national monetary policy (macroeconomic)

  o Only necessary if business cycles are not synchronized within EMU

    ▪ Mundell's "Optimum Currency Area"

What about Economic Benefits of EMU?

• *Greater integration*, especially of markets for goods

and services (microeconomic)

  o Here: survey and summarize empirical work

    quantifying trade effects of currency unions

  o Focus on recent work involving EMU data

Summary of Key Finding

- EMU has small but significant effect on trade

    o So far: at least 8%, probably 23%

    o Effect likely to grow over time

Integration May Also Have Indirect Benefits

- Can Affect Synchronization Business Cycle!

    o Strong effect empirically!

- There may be a "virtuous circle" for EMU if

    1. EMU raises trade AND

    2. Trade increases business cycle synchronization

- Thus EMU reduces need for national monetary policy, makes EMU self-sustaining

That is, Sensible Currency Unions seem to generate

Optimum Currency Areas *Endogenously*

- Two intrinsically empirical questions

    o Both much studied

    o Both with consistent positive results

- Caveat: the feedback loop appears to exist generally,

   but no studies focus on EMU (too early to tell)

Question #1

- What is the effect of a common currency on trade?

Answer

- Substantial; (difficult to quantify exactly; early!)

Much Work on Currency Unions and Trade

- Estimates (of γ and standard error) taken from "Gravity Model"

  of trade:

$$\ln(\text{Trade}) = \gamma\text{CurrencyUnion} + \text{controls} + \text{error}$$

- CurrencyUnion a dummy (1 for countries in currency union)

New, Growing Literature

- Now over 50 studies estimate effect

    o Over 1000 point estimates of γ

- In 2004, I surveyed (34) early studies

34 "Early" Estimates of Currency Union Effect

Author	Year	γ	s.e. of γ
Rose	2000	1.21	0.14
Engel-Rose	2002	1.21	0.37
Frankel-Rose	2002	1.36	0.18
Rose-van Wincoop	2001	0.91	0.18
Glick-Rose	2002	0.65	0.05
Persson	2001	0.506	0.257
Rose	2001	0.74	0.05
Honohan	2001	0.921	0.4
Nitsch	2002b	0.82	0.27
Pakko and Wall	2001	-0.38	0.529
Walsh and Thom	2002	0.098	0.2
Melitz	2001	0.7	0.23
López-Córdova, Meissner	2003	0.716	0.186
Tenreyro	2001	0.471	0.316
Levy Yeyati	2003	0.5	0.25
Nitsch	2002a	0.62	0.17
Flandreau and Maurel	2001	1.16	0.07
Klein	2002	0.50	0.27

Author	Year	γ	s.e. of γ
Estevadeoral, et al	2003	0.293	0.145
Alesina, Barro, Tenreyro	2003	1.56	0.44
Smith	2002	0.38	0.1
Bomberger	2002	0.08	0.05
Melitz	2002	1.38	0.16
Saiki	2002	0.56	0.16
Micco, Stein, Ordonez	2003	0.089	0.025
Kenen	2002	1.222	0.305
Bun and Klaassen	2002	0.33	0.1
de Souza	2002	0.17	0.24
de Sousa and Lochard	2003	1.21	0.12
Flam and Nordström	2003	0.139	0.02
Barr, Breedon and Miles	2003	0.25	0.033
de Nardis and Vicarelli	2003	0.061	0.027
Rose	2004	1.12	0.12
Subramanian-Wei	2003	0.732	0.08

How to Combine them? Meta Analysis!

- Set of quantitative techniques for evaluating and
  combining empirical results from different studies.

- Different point estimates (one per study) of given
  coefficient treated as individual observations

Can use this Set of Estimates:

- estimate underlying coefficient of interest

- test hypothesis that coefficient is zero

- link estimates to features of the underlying studies

- Each study weighted equally

- Independence?

Early Findings

- Clear rejection of null hypothesis of no effect

- Effect economically large (>25%)

Estimation Technique	Pooled Estimate of γ	Lower Bound of 95%	Upper Bound of 95%
Fixed	.29	.27	.31
Random	.64	.51	.77

- Also, strong signs of Publication Bias!

Relevant for EMU?

- Post-WWII Currency Unions before EMU involved

  countries either small, poor, or both

- Extrapolation to EMU was … extrapolation (noted!)

- With (1999/2002) start of EMU, can use actual data

- 26 studies use *actual recent European trade data*

26 Recent Studies of EMU and Trade

			Gamma	SE
1	Bun and Klaassen	2002	0.33	0.1
2	de Souza	2002	0.17	0.24
3	de Nardis and Vicarelli	2003	0.061	0.027
4	Cabasson	2003	0.63	0.24
5	Micco, Stein, Ordonez	2004	0.089	0.025
6	Barr, Breedon and Miles	2004	0.25	0.033
7	Baldwin and Taglioni	2004	0.034	0.015315
8	Faruqee	2004	0.082	0.018
9	de Nardis and Vicarelli	2004	0.093	0.039
10	Clark, Tamirisa, and Wei	2004	0.22	0.38
11	Baldwin, Skudelny, and Taglioni	2005	0.72	0.06
12	Yamarik and Ghosh	2005	1.8285	0.30475
13	Adam and Cobham	2005	1.029	0.039486
14	Baxter and Koupritsas	2006	0.47	0.22
15	Flam and Nordstrom	2006b	0.139	0.02
16	Berger and Nitsch	2006	-0.001	0.036
17	Gomes, Graham, Helliwell, Kano, Murray and Schembri	2006	0.069	0.011
18	Baldwin and Taglioni	2006	-0.02	0.03
19	Baldwin and Di Nino	2006	0.035	0.01
20	Flam and Nordstrom	2006a	0.232	0.024
21	Tenreyro and Barro	2007	1.899	0.351
22	Bun and Klaassen	2007	0.032	0.016
23	de Nardis, De Santis and Vicarelli	2007	0.04	0.01278
24	Brouwer, Paap, and Viaene	2007	0.067	0.025769
25	Flam and Nordstrom	2007	0.248	0.046
26	de Nardis, De Santis and Vicarelli	2008	0.09	0.033962

What do the Studies say, in the Aggregate?

1. EMU has Already Affected Trade

    a. P-value of zero effect is <.0000

        i. Both Fisher and Edgington methods

2. Size of Effect not Trivial

Estimation Technique	Pooled Estimate of γ	Lower Bound of 95%	Upper Bound of 95%
Fixed	.08	.07	.09
Random	.21	.15	.27

- EMU has already had 8%/23% effect on trade

  o Fixed: EMU effect same everywhere

  o Random: realization of random variable with same mean

No Single Influential Study

	Study Omitted	Gamma	Lower Bound of 95%	Upper Bound of 95%
1	Bun and Klaassen	.08	.07	.09
2	de Souza	.08	.07	.09
3	de Nardis and Vicarelli	.08	.07	.09
4	Cabasson	.08	.07	.09
5	Micco, Stein, Ordonez	.08	.07	.09
6	Barr, Breedon and Miles	.08	.07	.09
7	Baldwin and Taglioni	.09	.08	.10
8	Faruqee	.08	.07	.09
9	de Nardis and Vicarelli	.08	.07	.09
10	Clark, Tamirisa, and Wei	.08	.07	.09
11	Baldwin, Skudelny, and Taglioni	.08	.07	.09
12	Yamarik and Ghosh	.08	.07	.09
13	Adam and Cobham	.07	.06	.08
14	Baxter and Koupritsas	.08	.07	.09
15	Flam and Nordstrom	.08	.07	.09
16	Berger and Nitsch	.08	.08	.09
17	Gomes, et al	.09	.08	.10
18	Baldwin and Taglioni	.09	.08	.09
19	Baldwin and Di Nino	.10	.09	.10
20	Flam and Nordstrom	.08	.07	.09
21	Tenreyro and Barro	.08	.07	.09
22	Bun and Klaassen	.09	.08	.10
23	de Nardis, De Santis and Vicarelli	.09	.08	.10
24	Brouwer, Paap, and Viaene	.08	.07	.09
25	Flam and Nordstrom	.08	.07	.09
26	de Nardis, De Santis and Vicarelli	.08	.07	.09

More on Estimates of EMU Effect on Trade

- Lots of heterogeneity/uncertainty

- No single influential study

- More (smaller) countries lead to higher estimates

  - So older work (higher estimates) make sense

Survey Articles Are Consistent

- Lane (2006) "… the introduction of the euro may have boosted trade among the member countries …"

- Baldwin (2006) "The bottom line of this literature is that the euro probably did boost intra-Eurozone trade by something like five to ten percent on average, although the estimates size of this effect is likely to change as new years of data emerge."

Early Days Yet for EMU!

- Currency Union effects take time

- Short Run effects smaller than long run

- More time span leads to higher estimates

Tangent: Trade Diversion

- Does increased trade *inside* monetary unions divert

  trade away from non-members?

Theory

- *Not analogous* to customs unions in welfare

- Trade diversion can be harmful because trade gains

  are less than lost tariff revenue

  o Ex: import goods at $10, sell at $15=$10+$5tariff

  o Lose if eliminate tariffs from high cost exporter

  ($12)

But Monetary Union just lowers Transactions Costs

- No lost tariff revenue (better bridges, not lower

  tolls)

Practice

- Many Different Studies have searched for trade

  diversion

- *All* find evidence of *trade creation* between CU

  members & outsiders

Currency Unions are more open to Trade!

Summary: What is the Effect of EMU on Trade?

- Substantial evidence that EMU has grown trade

  o 26 studies using actual data

  o Many different researchers/techniques/biases

- Effect is large economically, statistically

  o At least 8% so far, perhaps 23%

  o Likely to grow with time, further entry into EMU

Question #2

- Is Business Cycle Synchronization (BCS) across

  countries systematically affected by trade?

Answer

- Yes: trade raise BCS

Importance

- By increasing trade, EMU could indirectly raise BCS

- Hence move region towards Mundell's "Optimum

  Currency Area" endogenously

  - A country that needs national monetary policy (to

    stabilize business cycles) *ex ante* may not need it

    ex post after entry into EMU

Framework

* To study empirical link between trade and business

  cycle synchronization, use bilateral equation:

  $$BCS = \alpha + \beta * \ln(\text{trade}) + \text{controls} + \varepsilon$$

where BCS a measure of business cycle synchronization

Measure of BCS between countries i and j over time

- Step 1: detrend output of i and j separately

  - HP-filtering; BK-filtering, differencing,…

  - Activity: GDP, Unemployment, Ind. Prod…

- Step 2: calculate correlation coefficient over time

20 Studies of Trade, Business Cycle Synchronization

			Beta	SE
1	Baxter and Kouparitsas	2005	0.134	0.032
2	Bower and Guillenmineau	2006	0.02055	0.00528
3	Calder	2007	0.013	0.004
4	Calderon Chong and Stein	2007	0.015	0.003055
5	Choe	2001	0.027	0.008333
6	Clark and van Wincoop	2001	0.09	0.03
7	Crosby	2003	0.048	0.063
8	Fidrmuc	2004	0.021	0.044872
9	Fiess	2007	0.123	0.062
10	Frankel and Rose	1998	0.086	0.015
11	Gruben, Koo and Mills	2002	0.059	0.017206
12	Imbs	2003	0.03089	0.020058
13	Imbs	2004	0.074	0.022289
14	Inklaar, Jong-a-Pin and de Haan	2005	0.115	0.041071
15	Kose and Yi	2005	0.091	0.022
16	Kose, Prasad and Terrones	2003	0.0107	0.0045
17	Kumakura	2006	0.0575	0.0354
18	Kumakura	2007	0.05555	0.01232
19	Otto, Voss and Willard	2001	0.0461	0.090999
20	Shin and Wang	2004	0.07665	0.07665

What is the message from the 20 Studies?

1. Trade affects BCS

     o P-value of zero effect is <.0000

        ▪ Both Fisher and Edgington methods

2. Economic Size of Effect not Trivial

Estimation Technique	Pooled Estimate of γ	Lower Bound of 95%	Upper Bound of 95%
Fixed	.020	.016	.023
Random	.043	.031	.054

- If estimate is .02, then each 1% increase in bilateral

  trade raises correlation coefficient by .02.

  o Ex: Trade Increase of 8% (EMU) raises correlation coefficient

  from .22 (sample average) to [.22 + (.02 x 8)] = .38

More on Estimates of Trade-BCS Link Across Studies

- Lots of heterogeneity/uncertainty(like Trade-EMU)

- No single influential study

- No obvious determinants

Summarizing the Trade - BCS Link

- Increases in Trade seem to have a substantial, significant effect on business cycle synchronization

  o More trade raises BCS

  o However, EMU members started with higher BCS

    ▪ Too early to tell if EMU affected BCS; few observations (business cycles) needed

Grand Summary

1. EMU raises trade by 8-23% so far

   a. Likely to rise further over time

2. Trade increases coherence of business cycles

   a. Strong effects, likely to rise further

   b. Makes national monetary policy less necessary

3. Too early to be definitive for EMU

   a. Currency unions among large, rich are novel

      i. Can't draw on history or other countries

   b. Need more time for data span to rise

      i. Especially true given lags in structural change

4. Still, Some Optimism seems Warranted

5. Final Caveat: Narrow Focus of this Research

o Other economic phenomena ignored

  ▪ Efficiency of Financial Markets, Quality of

    Monetary Policy, Risk-Sharing …

o Non-economic issues too!

  ▪ Ex: Sovereignty, Political Influence