



EUROPEAN CENTRAL BANK

EUROSYSTEM

A short-run analysis of exchange rates and international trade

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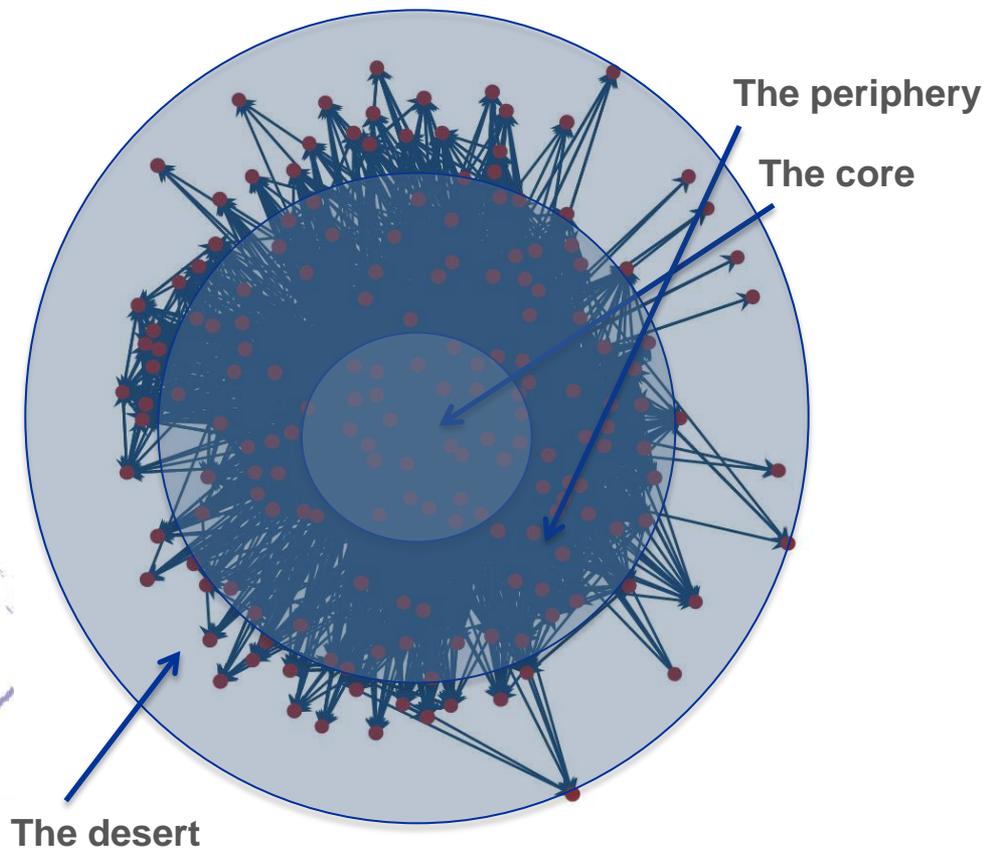
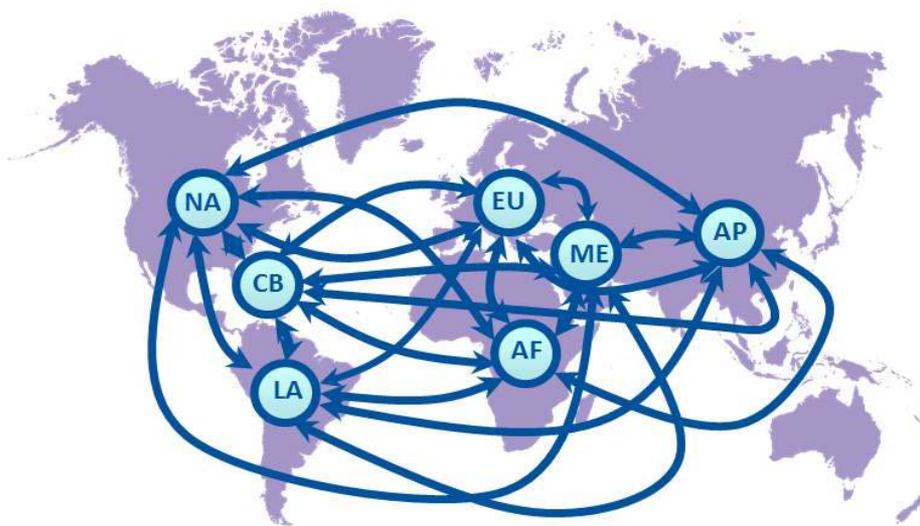
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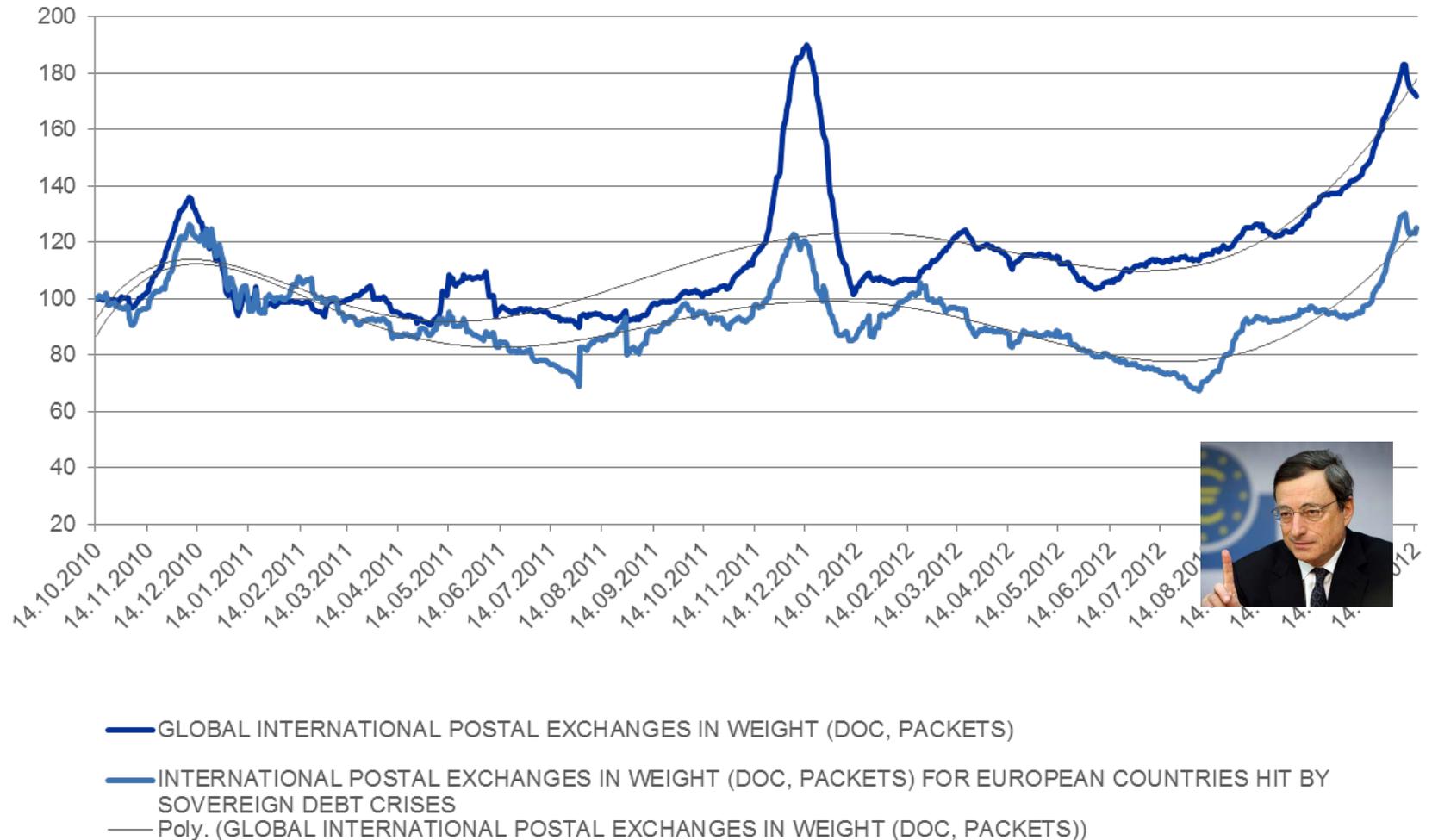
Global postal connectedness

Universal postal exchanges...

... depth and breadth of connections vary



The real signal and the noise in big postal data...

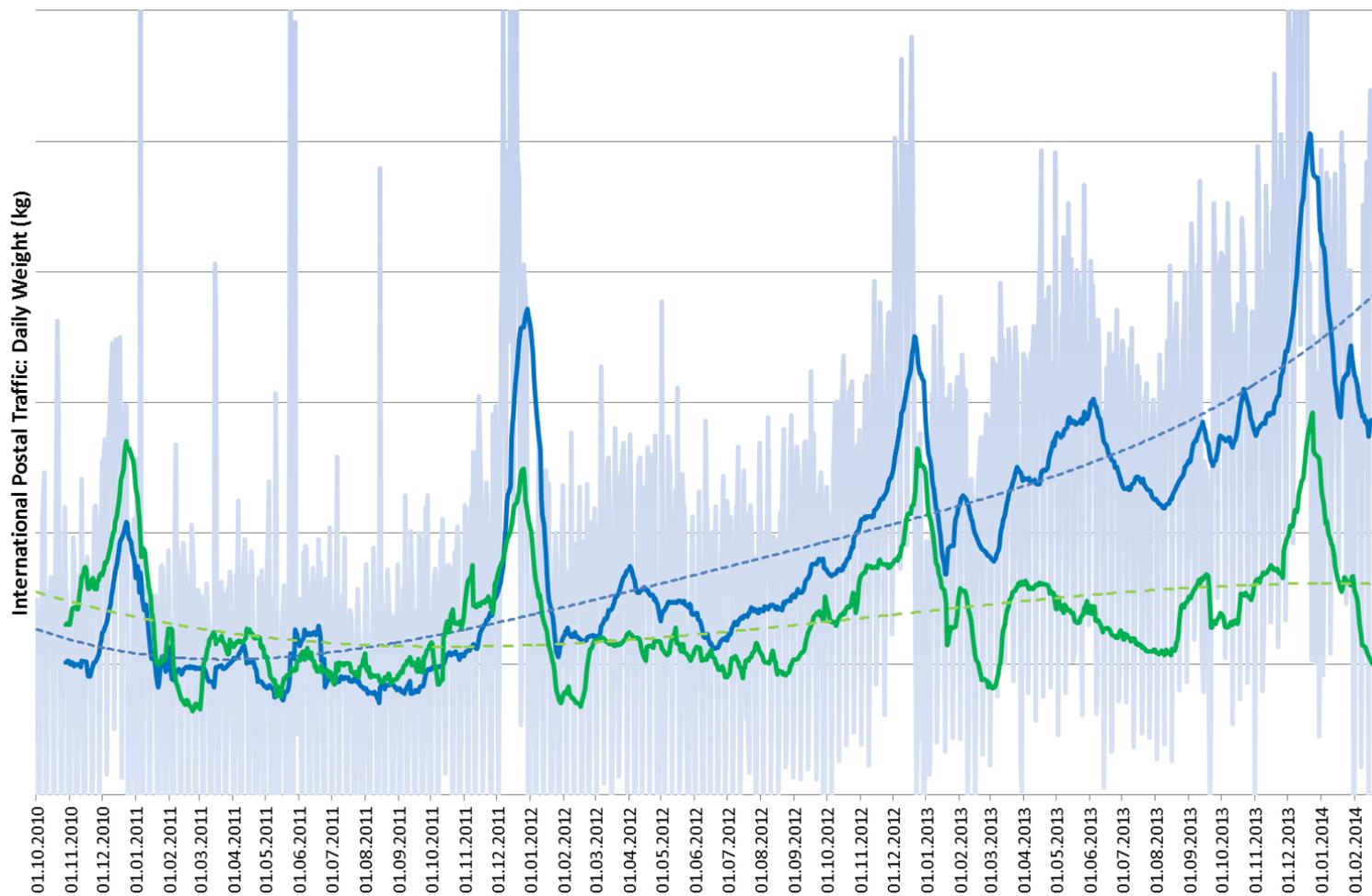


Big postal data and international trade data patterns

Dep. Variable	Exports top 50% HS2	Exports top 50% HS2	Exports top 50% HS2	Exports top 75% HS2	Exports top 75% HS2	Exports top 75% HS2
log parcels dispatched	0.887 (0.013)***	0.032 (0.007)***	0.710 (0.020)***	0.898 (0.011)***	0.024 (0.005)***	0.655 (0.018)***
R^2	0.345	0.345	0.675	0.395	0.395	0.725
Importer-time FE	NO	NO	YES	NO	NO	YES
Exporter-time FE	NO	NO	YES	NO	NO	YES
Importer-Exporter FE	NO	YES	NO	NO	YES	NO

Variable	<i>Offline</i>	<i>Online Intra-EU</i>	<i>Online Google</i>	<i>Online Ebay</i>	<i>Letter- Post (Weight)</i>	<i>Parcel- Post (Items)</i>
<i>Distance</i>	** -1.304	** -0.43	** -0.57	** -0.38	** -0.54	** -0.41
<i>No common legal sys.</i>	-	-	0.03	** -0.30	-0.07	-0.14
<i>No colony</i>	-	-	** -0.51	0.15	** -0.43	-0.11
<i>No common language</i>	* -0.188	** -1.540	** -1.20	** -0.48	** -0.26	** -0.69
<i>No common border</i>	-	-	** -0.81	-0.15	0.08	** -0.86
<i>No regional trade agr.</i>	-	-	** -0.64	** -0.16	** -0.11	** -0.24
<i>No common currency</i>	-	-	0.03	-	* -0.27	** -0.77

Daily big postal data and exchanges volatility



International arbitrage: econometric model

Pooled Mean Group (PMG) estimator (Pesaran et al., 1999)

Vector error correction model for panel data:

- Short-run coefficients and error differ across groups
- Long-run coefficient constrained to be identical

$$\Delta \ln EXP_{ij} = (\xi(\theta)_{ij})\phi_{ij} + \sum_{s=1}^p \Delta \ln EXP_{ij,-p} \lambda_{ijps} + \sum_{s=1}^p \Delta \ln FX_{ij,-p} \delta_{ijps} + u_{ij}t_T + \epsilon_{ij}$$

$$\xi(\theta)_{ij} = \ln EXP_{ij,-1} - \theta \ln FX_{ij,-1} \quad ij = 1, \dots, N; t = 1, \dots, T$$

$\Delta \ln EXP_{ij}$ Percentage increase of parcels dispatched from i to j

$\ln FX_{ij}$ Exchange rate between i and j

$\Delta \ln EXP_{ij,-p}$ and $\Delta \ln FX_{ij,-p}$ Lags of parcel dispatches and exchange rate between i and j

International arbitrage: empirical evidence

Dependent variable $\Delta \ln EXP$	PMG Estimates	PMG Estimates	PMG Estimates	PMG Estimates
Equilibrium relationship				
$l. \ln FX$	-0.600 (0.092)***	-0.626 (0.102)***	-0.636 (0.104)***	-0.494 (0.105)***
Short-run dynamics (Averaged)				
$l. \Delta \ln FX$	2.601 (6.706)	1.407 (3.465)	1.111 (1.466)	-0.864 (4.433)
$l2. \Delta \ln FX$		1.614 (1.238)	-0.721 (1.674)	-6.050 (4.539)
$l3. \Delta \ln FX$			0.873 (1.844)	-0.412 (3.773)
$l4. \Delta \ln FX$				-3.477 2.638
$l. \Delta \ln EXP$	-0.044 (0.095)	-0.127 (0.048)***	-0.045 (0.037)	0.270 (0.082)***
$l2. \Delta \ln EXP$		-0.030 (0.030)	-0.032 (0.033)	0.208 (0.110)*
$l3. \Delta \ln EXP$			0.003 (0.022)	0.167 (0.059)***
$l4. \Delta \ln EXP$				0.204 (0.075)***
Error correction	-0.779 (0.088)***	-0.714 (0.044)***	-0.762 (0.033)***	-1.049 (0.086)***
Constant	1.233 (0.124)***	1.427 (0.164)	1.615 (0.138)***	2.065 (0.214)***
Number of observations	326630	326630	326630	326630

Standard errors in parenthesis clustered by corridor

So what for central bankers?

- Consistent with domestic retail prices (offline prices) stickiness in the short-run
- Consistent with nominal exchange rate movements not impacting domestic sales prices (Burstein and Gopinath, 2013): low exchange rate pass-through in the short to medium run
- Consistent with short-run expected impacts of competitive devaluations

Value of big postal data for them?

- Rising predictive power of international postal networks providing alternative macroeconomic insights for policy makers in real-time
- Possibility of monitoring key macroeconomic and monetary policy parameters in real time leading to more timely choices

Big postal data and the value of understanding the very short-run economic dynamics

- Understanding the very short-run economic dynamics is critical for central bankers and other economic policy makers in times of economic uncertainty
- Cheaper alternative big data and statistics sources could provide key insights
- Could big postal data become one of the most valuable ones for you?

“Postal economics might be more central to understanding the economy than monetary economics”

Edward Prescott, 1980

