Exchange Rate Determination in Developing Countries: A Post Keynesian Approach

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Motivation and Overview

- PhD Dissertation
- 2 Aims
  - Methodological: application of PK call for methodological pluralism (qualitative methods) > consistent with PK ontology and theories
    - PK Theories of Exchange Rate Determination
  - Empirical: new process of emerging market currency internationalisation ("financialisation")
    - Implications for Exchange Rate Determination
    - Consistent with PK Theories of Exchange Rate Determination
- Motivation: "Excessive" Exchange Rate Volatility

Motivation and Overview

- 88 semi-structured interviews with financial market participants in Brazil and London- 52 with currency traders
  - Market Structure
  - Exchange rates determined by positions and expectations in short-term financial markets >> What determines these positions and expectations?
- Triangulated with Multivariate GARCH Models
  - Financial positions and expectations reflected in empirically observable exchange rate movements?

Outline

- PK Theories of Exchange Rate Determination
- PK Methodology
  - Ontological Background
  - Methods
- Results
  - (Market Structure and Social Theory of Price Formation)
  - Internationalisation of Brazilian Real in structured and hierarchic international monetary system
    - Exchange Rate Determination
    - Factors which determine this hierarchy – subordinated financial integration (Keynesian "Fundamentals"?)

Post Keynesian Exchange Rate Theory Social Conventions

- J.T. Harvey
- Expectations in short-term financial markets determine exchange rates
  - Expectations formed under fundamental uncertainty (non-ergodic)
  - No underlying permanent fundamentals (contrast Mainstream: ergodic)
  - Social Conventions establish stability
  - Exchange rate determinants necessarily context and time specific - Animal spirits
- *Currencies, Capital Flows and Crises (2009)*
  - Exchange rates determined by expectations about flows > base factors and indicators
  - Context and time specific: interest rates, unemployment, trade balance and inflation as Keynesian fundamentals

Post Keynesian Exchange Rate Theory Social Conventions – Critique

- Microstructure
  - Actor-based approach to price formation
- Macrostructure
  - Hierarchic and structured international monetary and financial system (Riese, 1986; Dow, 1999; Herr&Huebner, 2005; Prates & Andrade, 2011)
- Anything to be said about exchange rate determination beyond context and time?
  - Qualitative case study research to uncover expectations formation
  - Underlying processes and structures which shape expectations formation and portfolio decisions (Dow, Chick, Lawson)

Post Keynesian Exchange Rate Theory Social Structure

- Money as underlying institution in the presence of fundamental uncertainty > Exchange rate relation between domestic and foreign money
- Keynes' liquidity preference theory and Chapter 17 in open economy
  - Hierarchic nature of international monetary system - Implications for Exchange Rate Dynamics in Developing Countries
    - Higher interest rates
    - Sensitivity to international market conditions (US)
    - Prevalence of short-term speculative capital flows > Volatility
  - Underlying factors which determine currency's liquidity premium and position in currency hierarchy ("Keynesian fundamentals") – Liquidity as ability to meet outstanding external obligations (Minsky)
    - Total stock of net short-term foreign obligations (net debtor vs. net creditor)
    - Current Account (Cash flow through income generation)
    - "Institutional" Liquidity (Cash flow through making position)

Post Keynesian Methodology

- Mixed-Method Triangulation
  - Qualitative Methods
    - Social Conventions: Investigate context and time specific expectations
    - Social Structure: Uncover underlying mechanisms and structures
  - Quantitative Methods
    - Manifestations of expectations and underlying structures on empirical level
- Consistent with PK Methodology

- Disclaimer

Post Keynesian Methodology Ontology and Method

- Open System Ontology
- Critical Realist Ontology
  - Three ontological domains: real, actual, empirical
  - Uncover the "real" which might or might not be reflected on empirical level
  - Transformative nature of human agency
- Method? - Mixed Method
  - Sheila Dow: Babylonian Method
  - Critical Realists: Retroduction
- Econometrics?

Post Keynesian Methodology
This Study

- 88 semi-structured interviews with financial sector participants (52 currency traders) triangulated with multivariate GARCH models
- Interviews
  - Identify Actors
  - Investigate time and context specific expectations
  - Uncover underlying mechanisms and structures
- Econometrics (BEKK and DCC MVGARCH)
  - "Test" for Currency Internationalisation (time-varying joint volatility)
  - Analyse empirical manifestations of agents' expectations and underlying processes and structures (Mean Equation)
- Research Strategy
  - Retroduction
  - Semi-Structured Interviews
  - Open Questions
  - "Directional"/"Speculative" Foreign Exchange Traders

Results
Microstructure

- Strong Heterogeneity of Agents and Expectations Formation – Actor based approach of financial market analysis (market structure matters) > Economic Policy
- 5 main private financial actors in Brazilian FX market
  - Onshore Banks
  - Onshore Hedge Funds
  - Offshore Banks
  - Offshore Hedge Funds
  - Offshore Real Money Investors

		Onshore		Offshore	
		Trading Strategy	Expectations Formation	Trading Strategy	Expectations Formation
Bank	Commercial	Client Trading Volatility trading Intra-day to 3 weeks Spot and Futures Market	Stock Market S&P Interest Rates Other Currencies Commodities	Client and Proprietary Trading Trend Trading Intraday to 3months Non-Deliverable Forwards (NDFs)	Sentiment Risk Aversion Technicals
	Investment	Proprietary Trading Trend Trading 3 weeks to 3 months Futures Market	Other Currencies S&P Commodities Stock Market Flows		
Fund	Hedge Fund	Proprietary Trading Trend Trading 3 weeks to 3 months Futures Market	Other Currencies Flows Positioning Macro-scenario	Proprietary Trading Trend Trading 3 days to 3 months NDFs	Flows Fundamentals Carry
	Real Money Fund	x	x	Proprietary Trading Investing (Carry Trade) 3 months and above NDFs, Local Currency	Fundamentals Flows Politics Carry

Results

Social Theory of Price Formation

- No permanent exchange rate fundamentals - Time and Context specific conventions
  - "…the fx market is much more random than other markets, so it is enough that a certain theme gains enough traction with enough people and then it will cause the move, so everybody starts talking about undervaluation then people will start on the bandwagon and then it will work, but usually it doesn't…(Prop Trader, Offshore Bank)
  - "….what I look at nowadays is….the scenario nowadays is one of depreciation of dollar, because of monetary easing and fiscal deficit in US…" (Prop Trader, Onshore Domestic Commercial Bank)
- Flows - Animal Spirit
  - "…but then you can obviously not ignore the flow, right, despite the fact that you like the fundamentals, but if there is a big flow going against you you rather wait, you have to be aware what is going in the market, pure fundamental trading is tough…" (Prop Trader, Offshore Bank)

Results

Social Theory of Price Formation

- Positioning
  - "…what moves the exchange rate very quickly is the net position of the market…the technical position of the market… if the market is at bottom of this spectrum and wants to unwind this position very quickly this is what really can cause substantial and abrupt currency moves." (Onshore Hedge Fund)
  - Crisis: "…from September 2007 onwards the message was get out of all crowded trades because the devaluation is going to be a lot if everybody is going for the exit" (Prop Trader, Offshore Bank, D130)
- "Quality" of flows and positioning as fundamental factors

Results

Processes and Structures

- Internationalisation and Financialisation of Brazilian Real
  - "…the big difference is that the Brazilian Real has become an internationally traded currency which is traded with a basket of other internationally traded currency…", which means that "…you internalize dynamics which are not yours…" and "…the real is a currency which has stopped being affected only by internal conditions" (Onshore Fund, F).
  - Market Structure: Increasing importance of heterogeneous (speculative) foreign investors
  - Indicators for Expectations Formation
    - International Market Conditions (S&P; Commodities; Risk Aversion)
    - Other Internationally traded Currencies (AUSD, NZLD, MXP, TKL, ZAR)
    - Short-term financial returns ("Carry") (AUSD, Commodities)

Results

Processes and Structures

- Subordinated integration in hierarchic international monetary and financial system
  - "…if you are an EM currency you are constantly perceived to be under threat, and that can become a self-fulfilling prophecy… "(Offshore Bank, J41)
  - Importance of international market conditions
    - Harvey for the US: domestic factors (inflation, unemployment, interest rates, trade balance)
    - Onshore vs. Offshore traders
  - Carry trade Operations
  - Preponderance of short-term speculative flows (liquidity)

Results

Processes and Structures

- "Keynesian Fundamentals"? – Liquidity Premium determined by ability to meet outstanding external obligations?
  - International Investment Position (Real Money Investors):
    - "…Well…I think that the balance between…considering the balance sheet of national treasury I think that is important, that is one important aspect, mainly when there is a kind of switch, when countries has more assets than liabilities, I think in terms of fundamentals this is important…" (Onshore Fund, C60).
  - "Quality of Flows"/Positioning
  - "Institutional" Liquidity
    - "….no fundamentals, this is all market…the price you trade…the liquidity…the products" (Offshore Bank)

Results
Multivariate GARCH Models

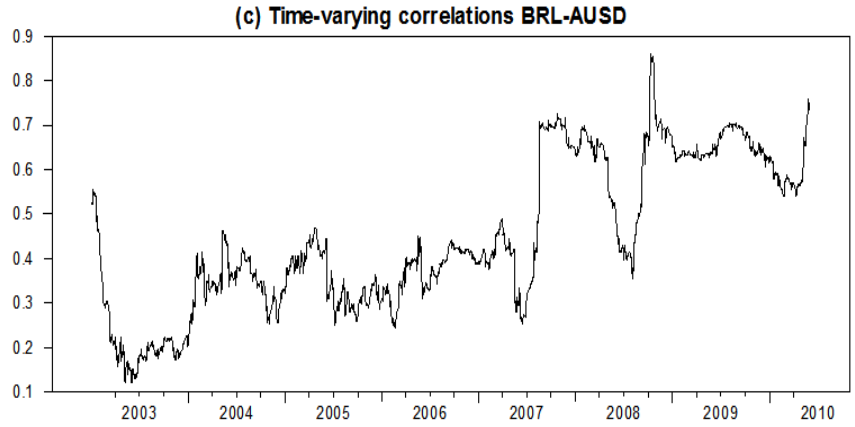
- Triangulate two insights from semi-structured interviews
  - Internationalisation of Brazilian Real through increased co-movement with other internationally traded currencies (in return and volatility)
    - Mexican Peso, South African Rand, Turkish Lira, Australian Dollar, New Zealand Dollar
  - Exchange Rate Drivers in the "new" era of currency internationalisation (Mean Equation)
    - Short-term Interest Rates (Differential between Selic and Fed Fund Rate)
    - International Market Conditions (S&P500, VIX)
    - Commodities (CRB spot index)

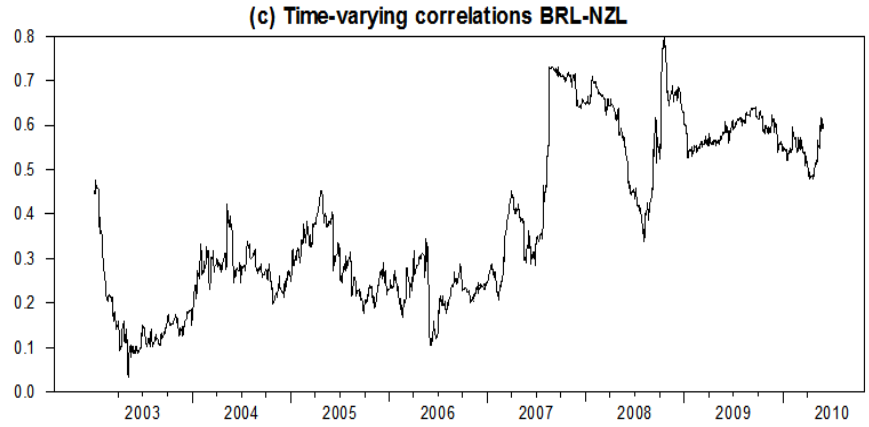
Results
Multivariate GARCH Model

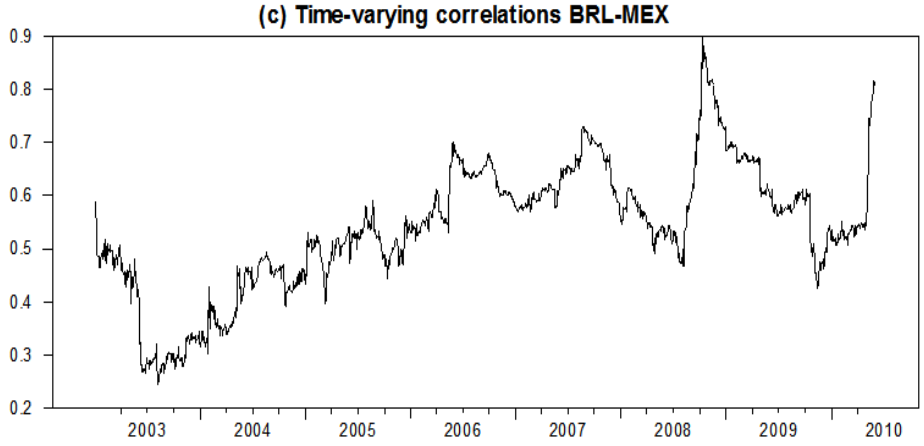
$$r_t = \alpha + Ar_{t-1} + X + \varepsilon_t$$

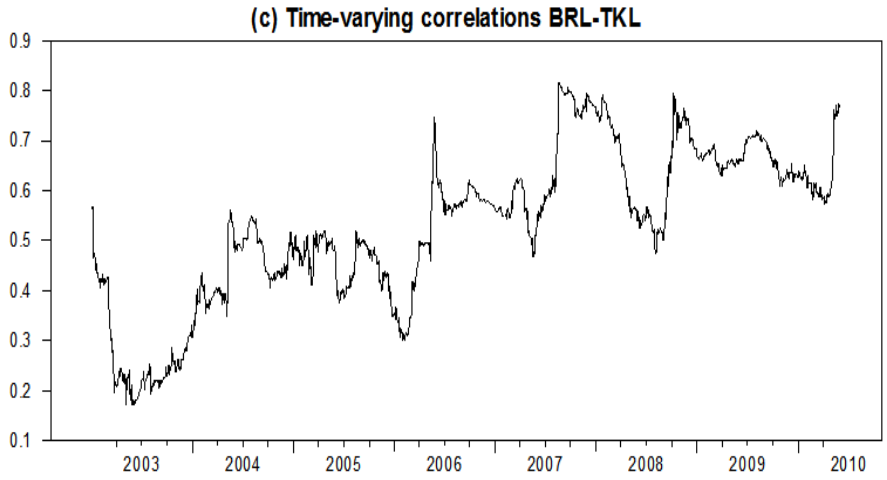
where r_t is an n*1 vector of daily returns on exchange rate at time t for each market and $\varepsilon_t | I_{t-1} \sim N(0, H_t)$. X denotes the vector of current or lagged determinants of the exchange rate. The n*1 vector of random errors ε_t is the innovation for each market at time t with its corresponding n*n conditional variance-covariance matrix H_t.

Results
Time-Varying Joint Volatility (DCC)









Results
Mean Equation (BEKK)

Brazilian Real -	01/07/99-01/06/10		01/01/03-01/06/10		01/04/05-01/06/10		01/08/07-01/04/09	
Australian Dollar	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
RBRL(-1)	*0.029	1.75	0.021	1.22	(-)0.010	(-)0.47	*(-)0.084	(-)1.75
RAUSDI(-1)	0.026	1.50	*0.026	1.79	**0.062	2.15	***0.150	3.13
RVIX	*0.005	1.89	0.003	1.11	(-)0.003	0.77	0.001	0.18
RSP	***(-)0.076	(-)5.15	***(-)0.111	(-)6.09	***(-)0.199	(-)7.66	***(-)0.117	(-)4.36
RCRB	***(-)0.191	(-)6.89	***(-)0.282	(-)8.63	***(-)0.299	(-)7.97	***(-)0.681	(-)10.50
RRONBU(-1)	(-)0.000	(-)0.82	(-)0.000	(-)0.24	**(-)0.003	(-)2.03	***(-)0.007	(-)3.57
RBRL(-1)	***0.043	3.44	***(-)0.059	4.81	0.013	0.58	(-)0.054	(-)1.16
RAUSDI(-1)	(-)0.005	(-)0.26	(-)0.242	(-)1.24	0.000	0.97	***0.126	2.59
RVIX	(-)0.002	(-)0.74	***(-)0.010	(-)2.68	***(-)0.017	(-)3.86	0.000	0.08
RSP	*(-)0.030	(-)1.95	***(-)0.098	(-)4.43	***(-)0.187	(-)6.42	***(-)0.069	(-)2.63
RCRB	***(-)0.303	(-)11.28	***(-)0.388	(-)11.62	***(-)0.382	(-)10.37	***(-)0.816	(-)11.75
RRONBU(-1)	0.000	0.998	(-)0.000	(-)0.06	(-)0.002	(-)1.31	***(-)0.006	(-)2.95
C(1,1)	***0.126	9.59	***0.136	8.66	***0.164	9.23	***0.191	4.48
C(2,1)	(-)0.006	(-)0.74	0.007	0.35	0.027	1.18	***0.193	4.93
C(2,2)	***0.076	7.56	***0.077	6.29	***0.089	6.78	0.000	0.00
A(1,1)	***0.374	19.557	***0.358	15.42	***0.345	9.76	0.006	0.09
A(1,2)	0.014	1.58	0.030	1.60	0.013	0.52	***(-)0.250	(-)5.4
A(2,1)	0.007	0.73	0.028	1.12	**0.101	2.57	***0.382	7.11
A(2,2)	***0.216	18.17	***0.222	14.14	***0.264	11.97	***0.474	12.11
G(1,1)	***0.918	107.36	***0.918	94.34	***0.911	61.23	***1.026	51.49
G(1,2)	(-)0.003	(-)1.07	(-)0.007	(-)0.915	0.004	0.68	***0.197	9.53
G(2,1)	0.008	1.15	0.004	0.47	(-)0.016	(-)1.000	***(-)0.250	(-)10.20
G(2,2)	***0.972	308.68	***0.972	203.75	***0.957	134.64	***0.792	39.33
	T-Statistic	P-Value	T-Statistic	P-Value	T-Statistic	P-Value	T-Statistic	P-Value
MVQ	50.12	0.13	41.99	0.38	44.95	0.27	49.08	0.15
MVQ-SQ	34.78	0.70	23.89	0.98	26.85	0.94	51.67	0.10

Conclusions

- 2 Contributions to Literature
  - Applied PK mixed-method Study – Consistent with PK Ontology and Method
    - Context and Time Specific Expectations
    - Underlying Structures
    - Triangulated with Time Series Econometrics
  - Recent Process of Emerging Market Currency Internationalisation
    - Confirmation of PK Social Theory of Price Formation
    - Hierarchic Structured International Monetary System
    - Short-term capital flows as manifestation and propagator of subordinated position

>> Policy Implications