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Macroeconomic Implications of Financial Frictions in the Euro Zone: Lessons from Canada

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MACROECONOMIC IMPLICATIONS OF FINANCIAL FRICTIONS IN THE EURO ZONE: LESSONS FROM CANADA

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The Role of Credit

- Credit availability is an essential part of MP effectiveness
  - Known for a long time (e.g., Roosa 1951) but ignored, forgotten, or under-appreciated
    - …Until 2007
- (At least) Two macroeconomics channels are believed to exist
  - 'price' channel (i.e., interest rate)
  - 'non-price' or credit rationing channel (e.g., stemming from asymmetric information problems)

Current Research: Motivation & Background

- Current economic environment highlights the links between the real and financial sectors
  - Of special interest: the role of credit
- Credit supply has long been known to have a *price* and a *non-price* element
  - Price: interest rate
  - Non-price: 'credit standards'
- Could the non-price element be "macro-economically" important?

The Questions Asked

- Do changing credit 'conditions' influence real economic outcomes?
  - Credit constraints can put a "…a break on the recovery in stressed countries, which adds to disinflationary pressures" (Draghi, MAY 26, 2014)
  - An under-appreciated source? Surveys of lending standards
- Do (monetary) policy rate shocks influence loan standards?
- How does the picture change when '*real time*' data are used?
- Comparisons between Small and Large Open Econ could be indicative of spillover type effects

The Canadian Dimension: SOE Influenced by Large Neighbours

- Canada has had a good crisis….BUT
  - Real & financial conditions conspired to spillover into the CAD economy, in spite of FLEX and IT
  - There are (negative) spillovers from the EZ crisis in 2010
- Imagining the worst?
  - A (permanent) deterioration of financial on the scale of Greece would lead to an 8% drop in CAD real GDP over 10 quarters

Related Literature

- From Roosa (1951) to Fuerst (1994)
  - Credit availability influences the effectiveness of MP
- Blanchard and Fischer (1989)
  - Credit rationing exists, so interest rates are not market clearing
- Stiglitz and Weiss (1981)
  - Interest rate changes create *adverse selection* (withdrawal of risk averse borrowers) and *moral hazard* problems (incentives to engage in risky behavior): imperfect information in credit markets means they are not market clearing
- Schreft and Owens (1991)
  - Lending standards can change before cost of funds does. Therefore, non-price lending standards represent an important link between MP and the financial sector
    - Measured via surveys

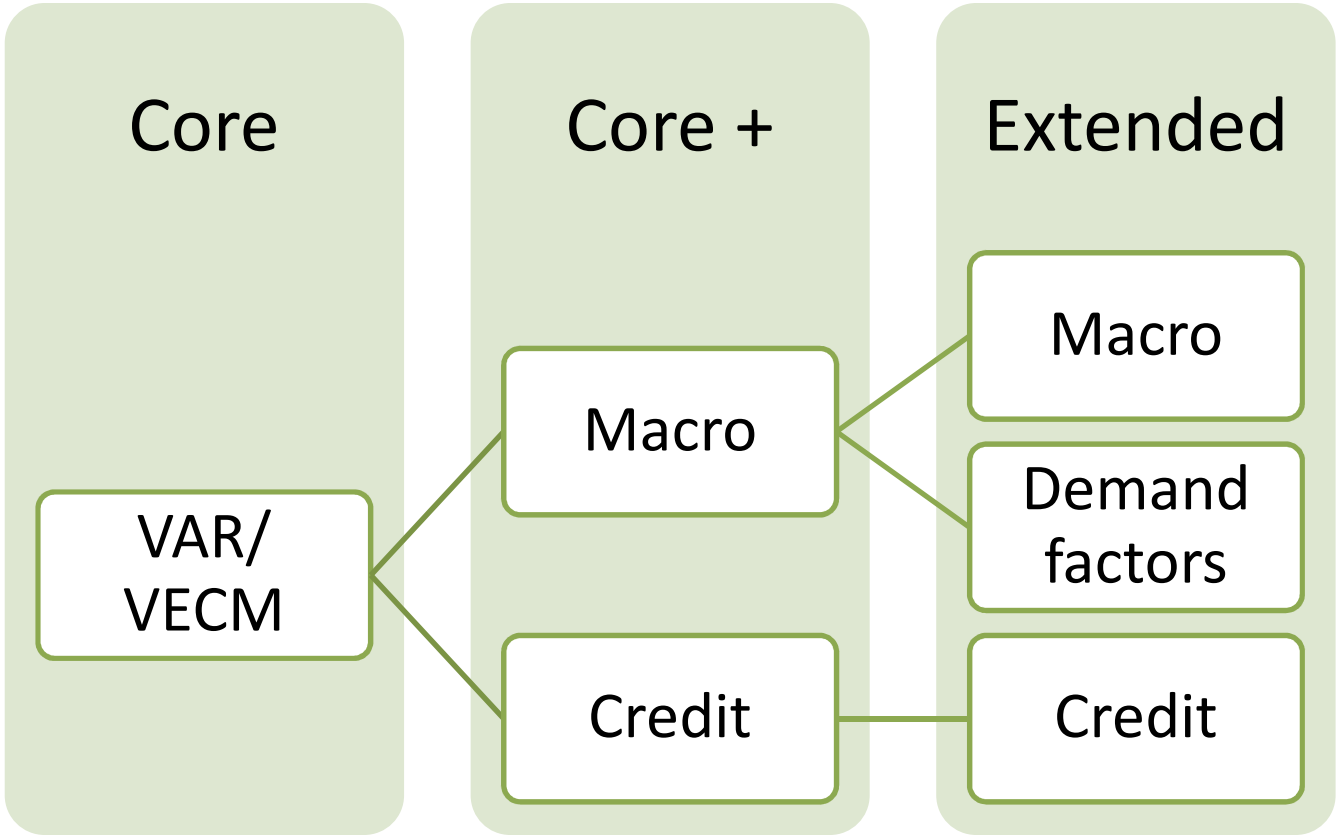
Does the Type of Financial System Matter?

- Put simply, YES
  - Proposed model works best where bank credit dominates (e.g., Canada, EZ). Focus is on business loans
    - But SLOS type data are being extended to other sources of lending (e.g., Housing, Consumer credit)
  - When there are other sources (e.g., stock market) there is a 'missing variable' (e.g., US)
  - …and then there is shadow banking
    - Financial frictions are NOT unique

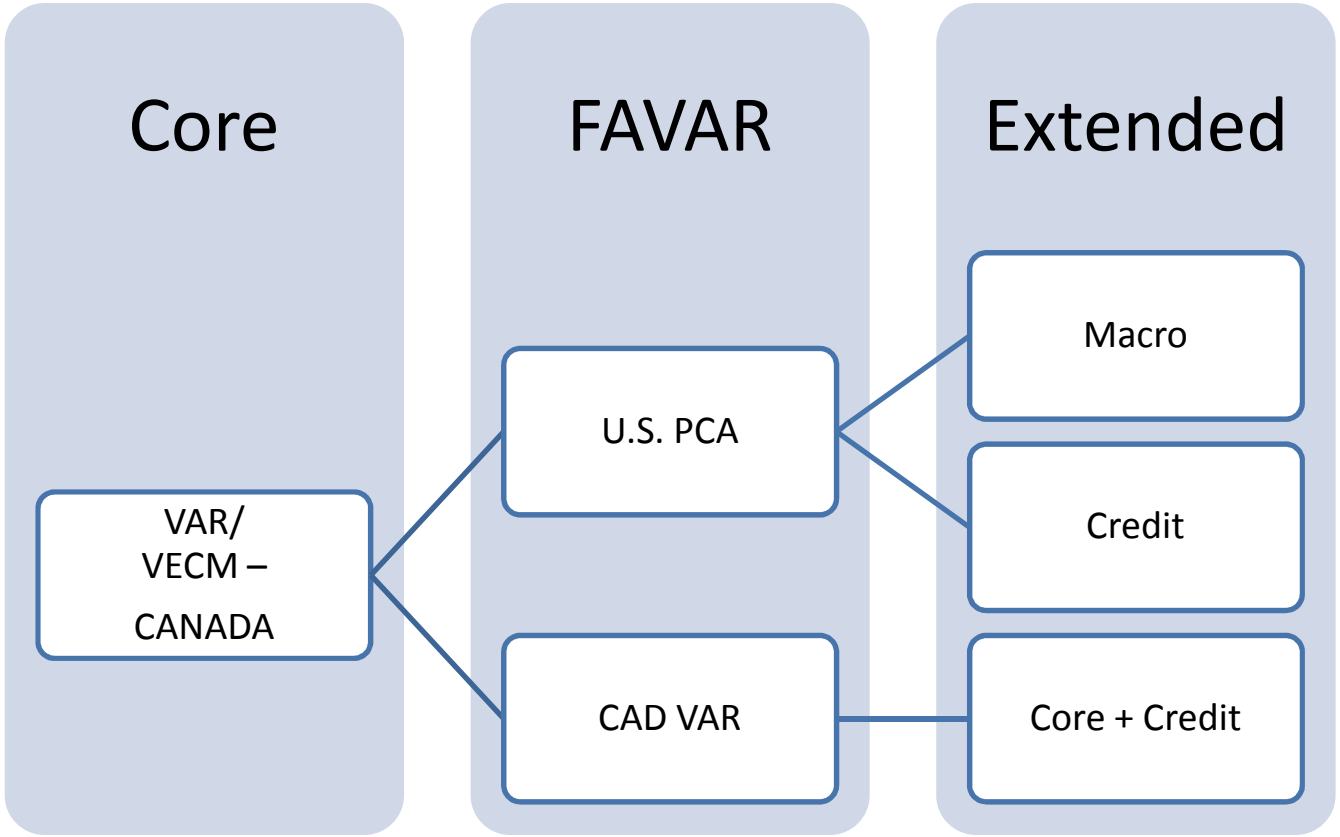
Non-Price Lending Standards and the Macro-economy

- Lown et.al. (2000)
- Lown and Morgan (2006)
- Swiston (2008) Beaton et. Al. (2009)
  - 1% tightening leads to 2.5% reduction in loans, > 2% fall in investment
  - Tightening of standards leads to a fall in GDP (≈ 0.25-1%)
  - Tightening of MP leads to a tightening of standards (≈8%)
  - SLOS data anticipates macro-data that would also be reflected in a fall in loans

Testing Strategy: Outline



Testing Strategy: Extension



Testing Strategy: Equations

$$\mathbf{y}_t = \mathbf{A}_0 + \mathbf{A}_1 \mathbf{y}_{t-1} + \boldsymbol{\varepsilon}_t$$

$$\mathbf{y}_t = \mathbf{A}_0 + \mathbf{A}_1 \mathbf{y}_{t-1} + \mathbf{A}_2 \mathbf{z}_{t-1} + \boldsymbol{\varepsilon}_t$$

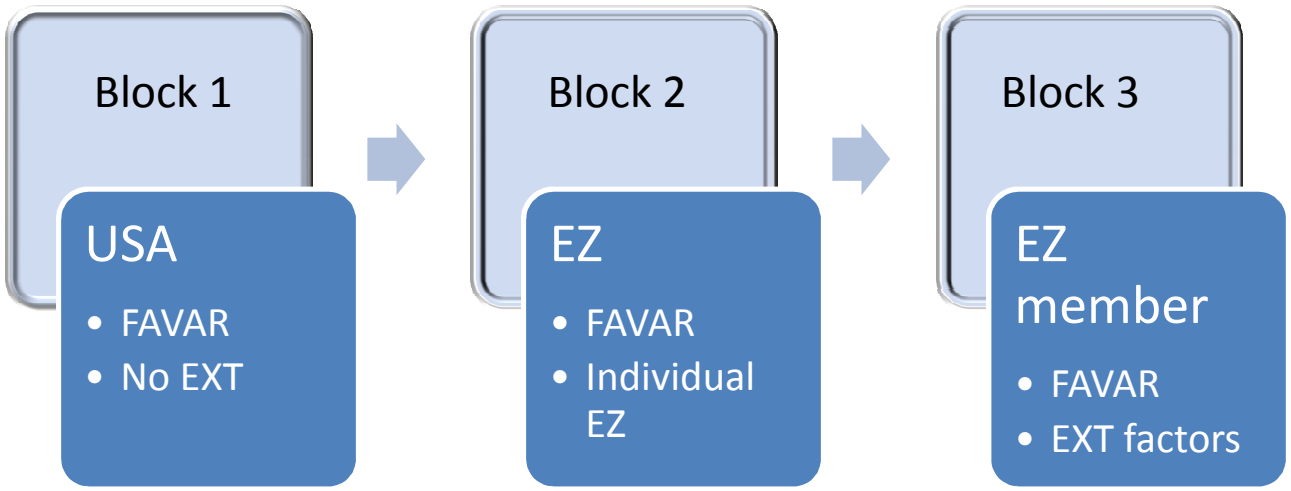
$$\mathbf{y}^*_t = \mathbf{A}'_0 + \mathbf{A}'_1 \mathbf{y}^*_{t-1} + \mathbf{A}'_2 \mathbf{z}_{t-1} + \boldsymbol{\varepsilon}_t$$

$$\Delta \mathbf{y}_t = \mathbf{A}'_0 + \pi \mathbf{y}_{t-1} + \boldsymbol{\varepsilon}_t$$

$$\mathbf{y}^{US}_t = \Lambda \mathbf{F}^{US}_t + \mathbf{e}_t$$

$$\begin{pmatrix} \mathbf{F}_t \\ \mathbf{y}_t \end{pmatrix} = \psi(\mathbf{L}) \begin{pmatrix} \mathbf{F}_{t-1} \\ \mathbf{y}_{t-1} \end{pmatrix} + \nu_t$$

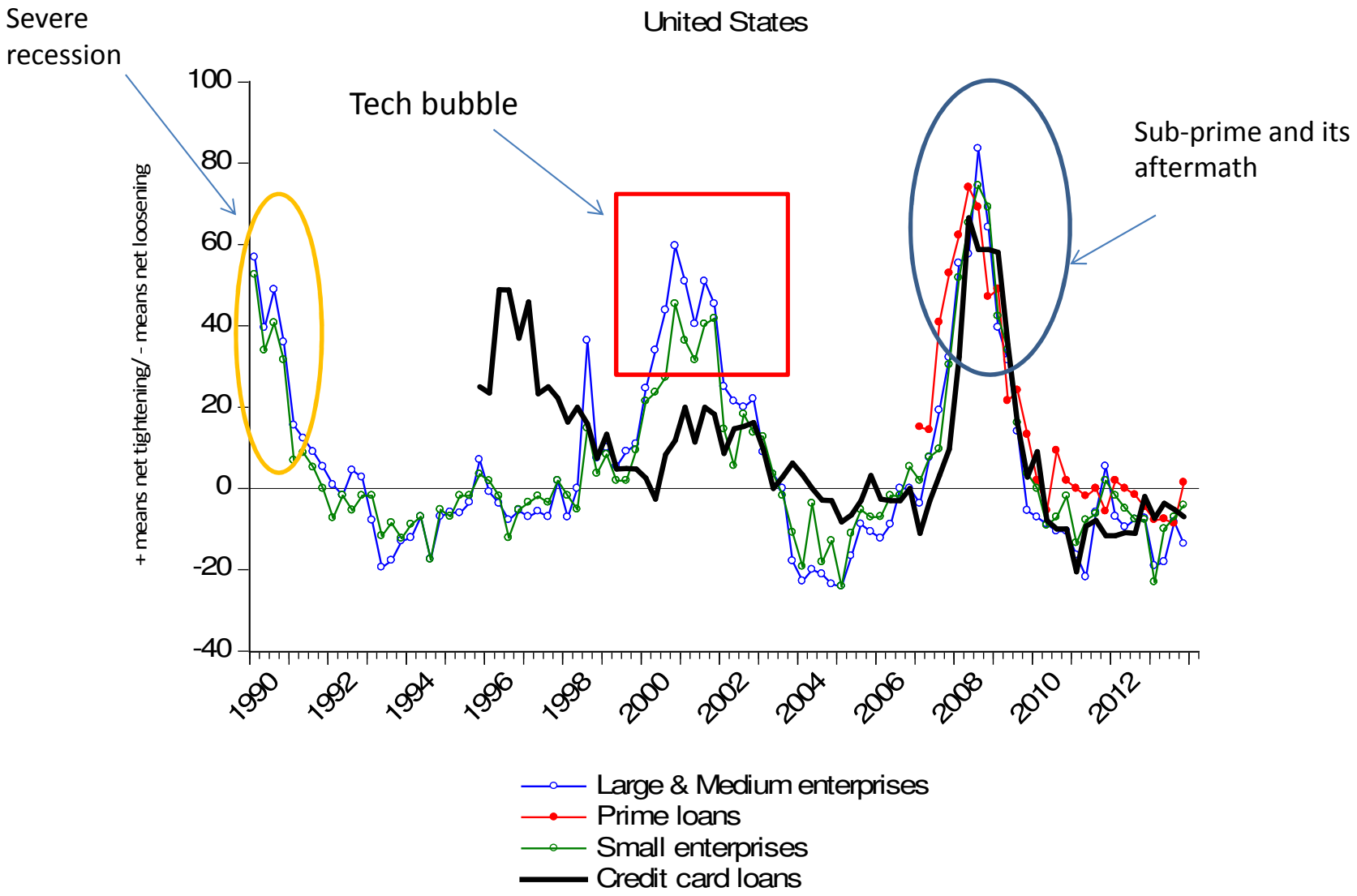
Alternative Testing Strategy: A GVAR (To Come)



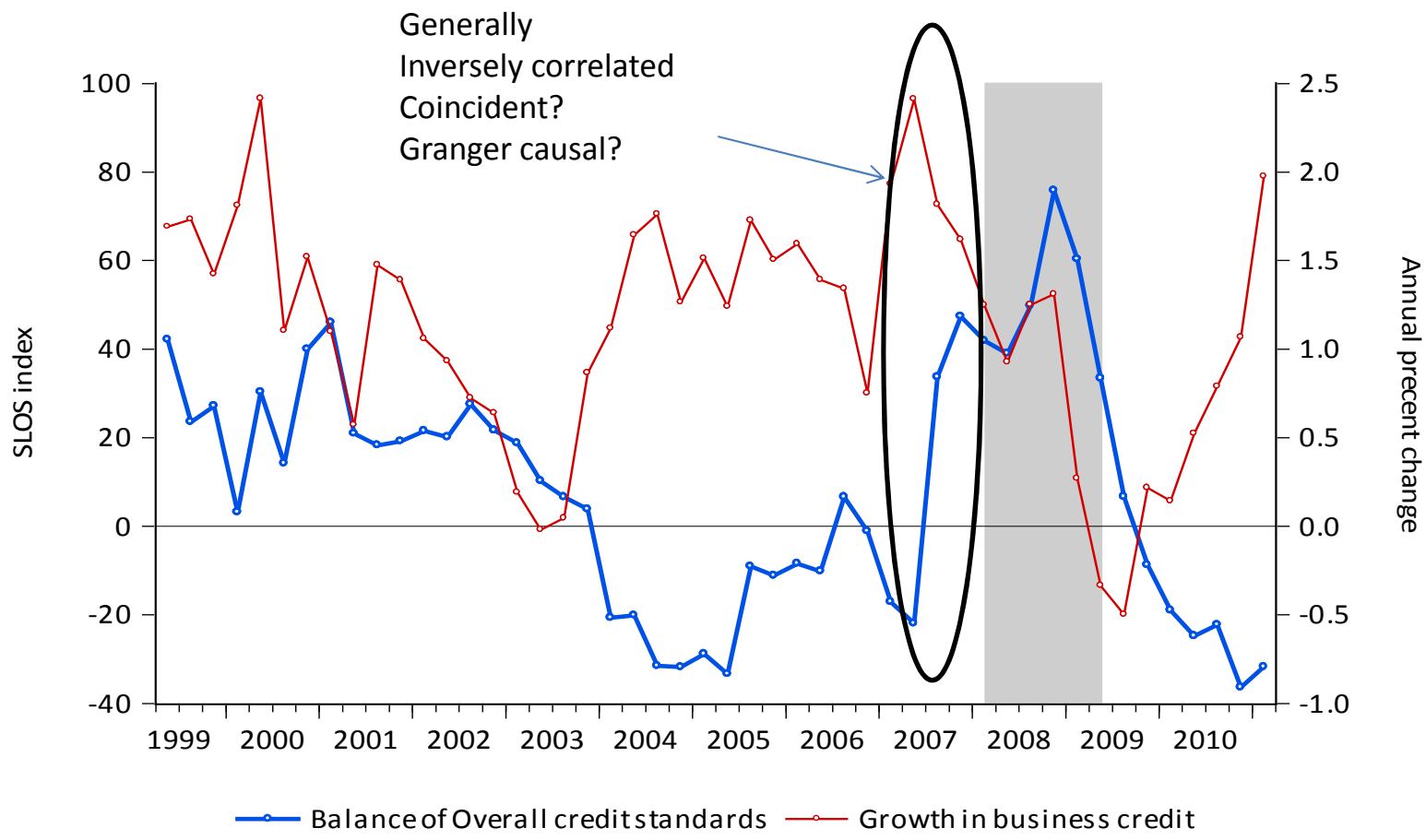
Data & Stylized Facts

- SLOS U.S. (since 1970s) & Canada (since late 1990s) ~ 'balance of opinion'
  - *"Over the past three months, how have your bank's credit standards for approving loan applications for C&I loans or credit likes – excluding those to finance mergers and acquisitions – changed? 1) Tightened considerably 2) tightened somewhat 3) remained basically unchanged 4) eased somewhat 5) eased considerably"*
  - "*How have your institution's general standards (i.e. your appetite for risk) and terms for approving credit changed in the past three months?*"

Senior Officer Loan Survey : U.S.



Senior Officer Loan Survey and Commercial Loans, 1999-2011: Canada



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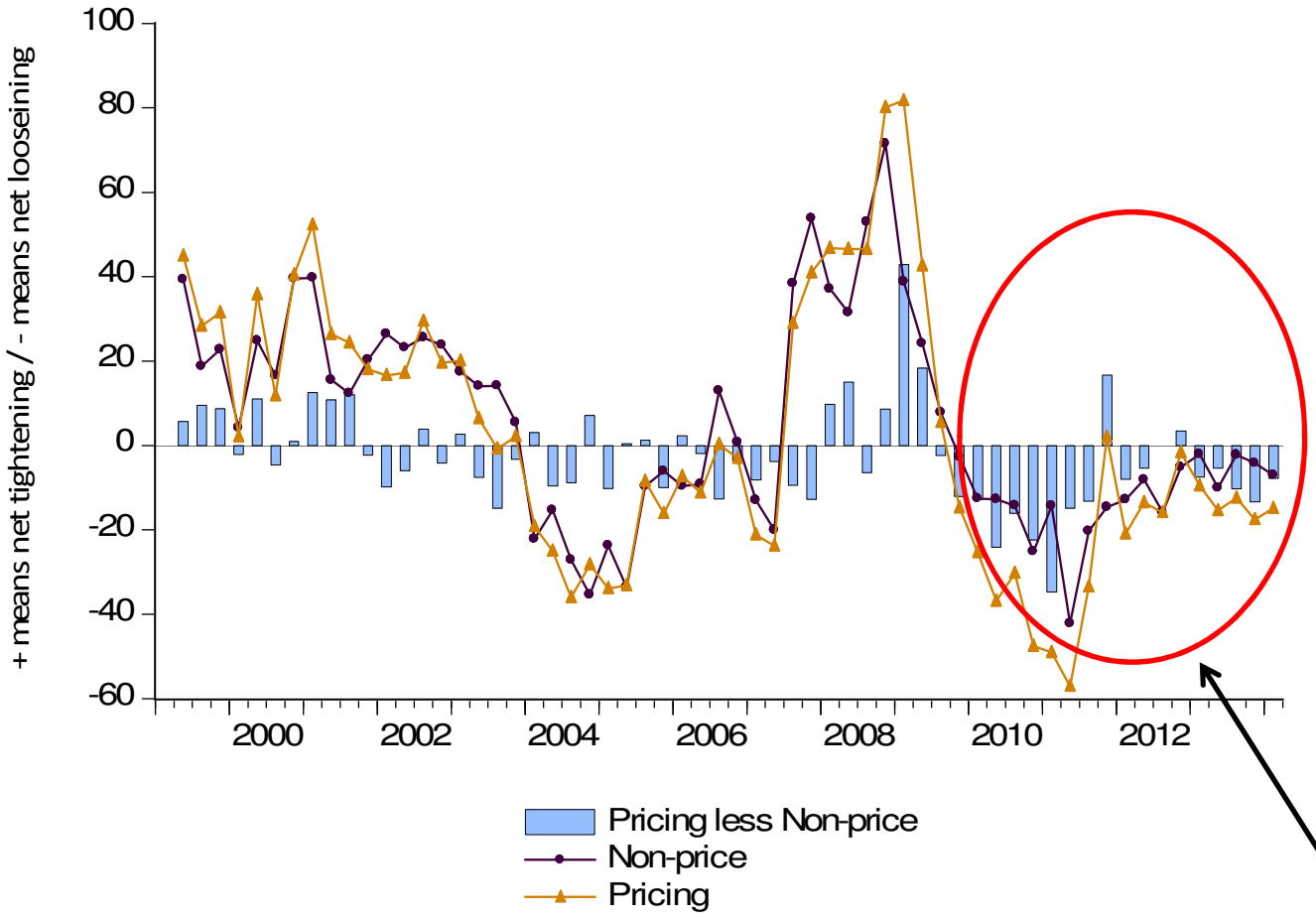
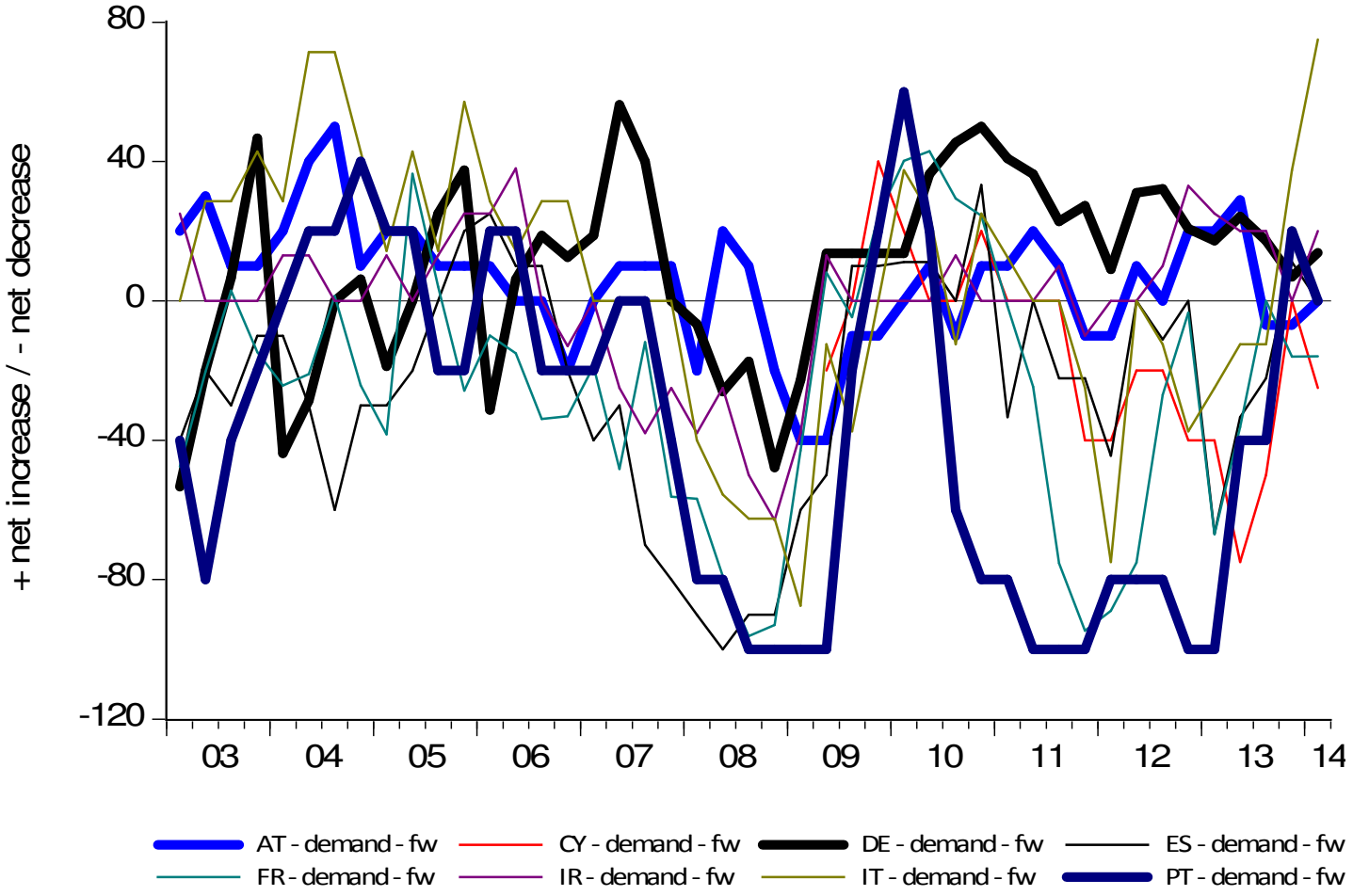
  - "*How have your institution’s general standards (i.e. your appetite for risk) and terms for approving credit changed in the past three months?*”
- Canada has ‘price’ versus ‘non-price’ distinction but differences not informative

Price and Non-Price Survey Indicators: SLOS for Canada

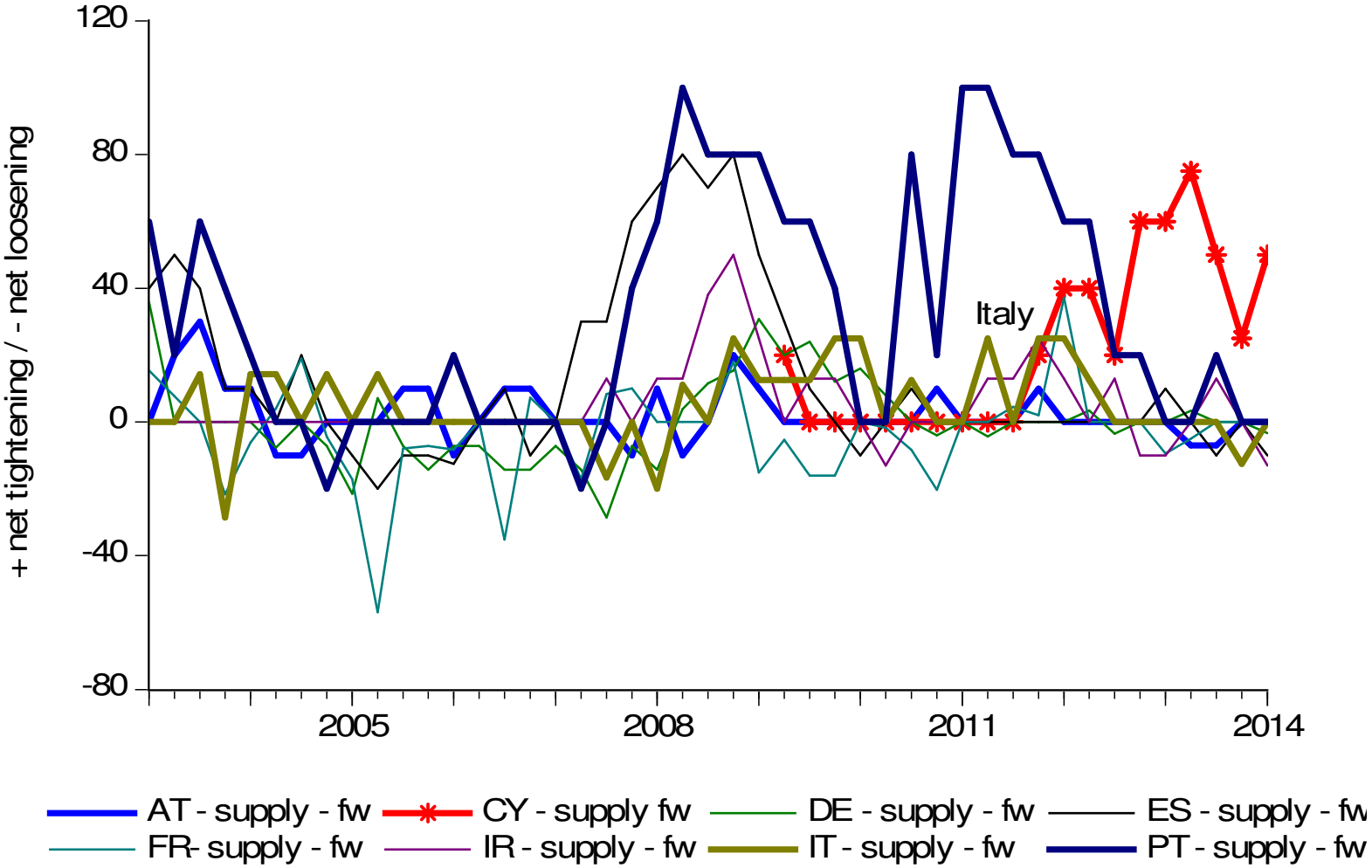


Something new?
Rise of 'macroprudential'?

BLS – Housing credit - Eurozone I



BLS – Consumer credit - eurozone II



Other Series

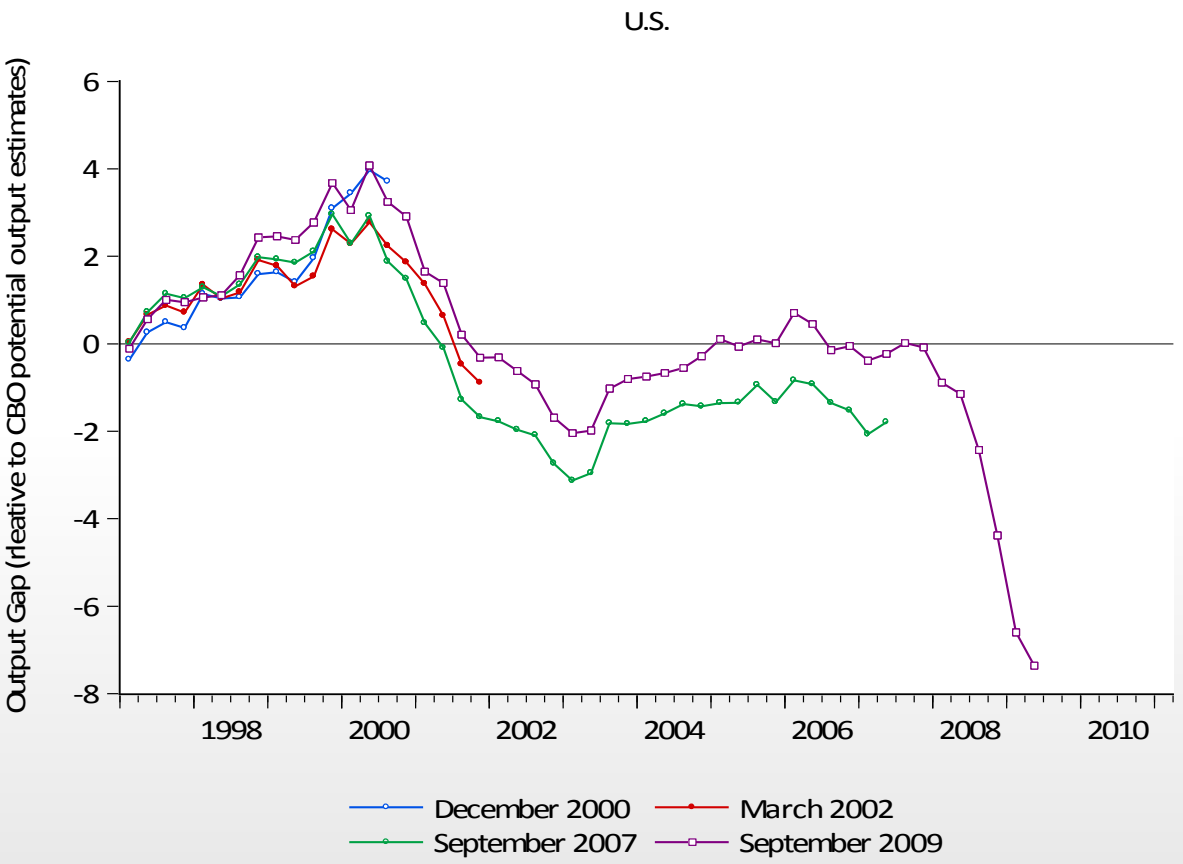
- Real GDP, GDP Deflator, Commodity prices
  - Defines basic macro model
- Add: Loans, SLOS
  - Defines ‘core’ or ‘benchmark’ model
- Add: expected real GDP growth, term spread, FCI*
  - Defines extended model
  - * acts as a quasi **F** since it “measures risk, liquidity, and leverage in money markets and equity markets as well as in the traditional and ‘shadow’ banking systems”

An Important Addition: real-time data

Vintages: U.S. Real GDP	Significance	Vintages: U.S. Potential Output
2000 December	Just before P	2000 July
2002 March	Just after T	2002 February
2007 September	Just before P **– PRE-CRISIS**	2007 August
2009 September	Just after T **– FIN CRISIS**	2009 August
Vintages: CAN real GDP	**Significance**	From Bank of Canada
2002 March	See US	
2007 Q3	See US	
2007 Q4	Peak CAD bus cycle	
2009 Q3	BoC interest rate comm.	

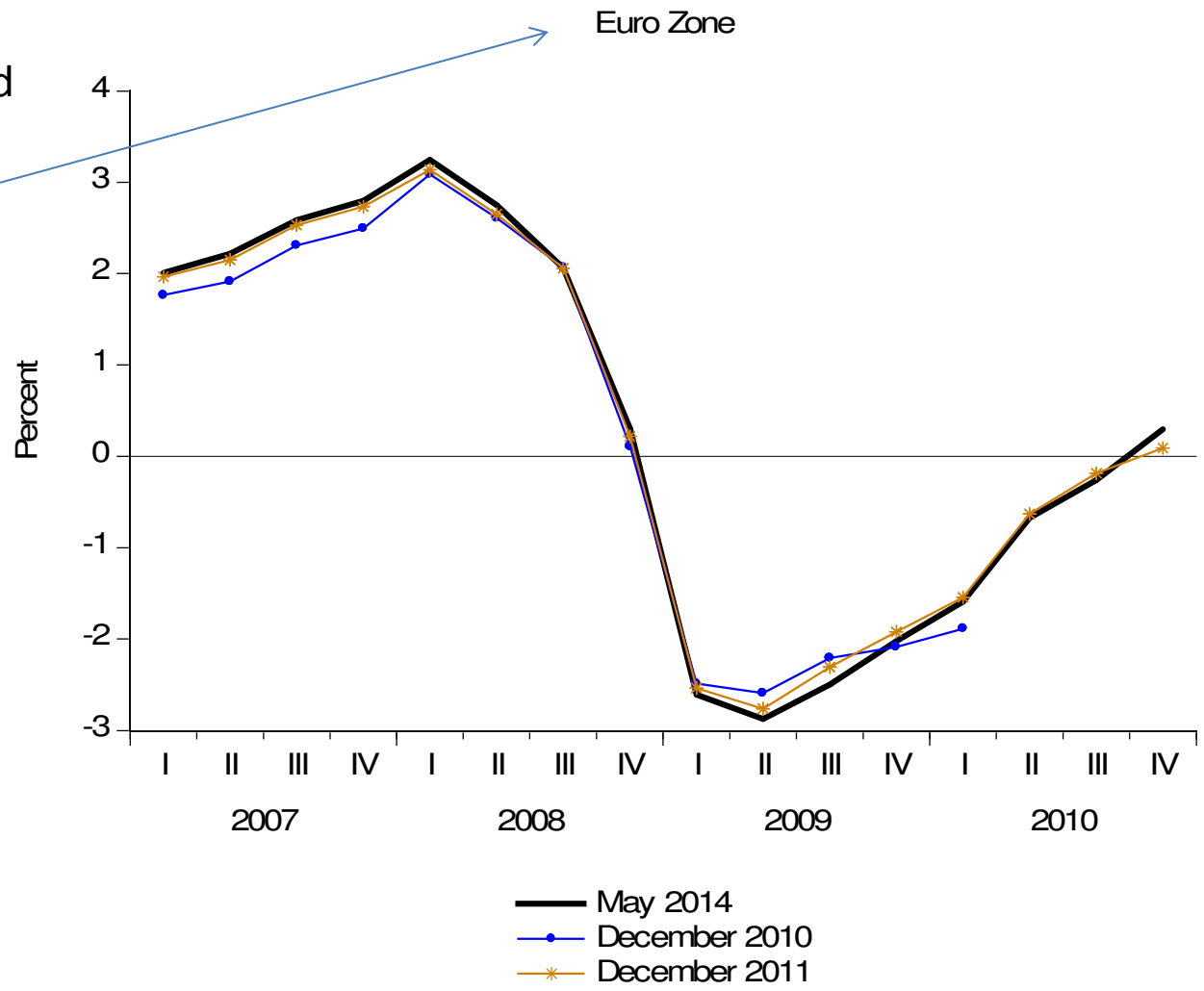
Ongoing work involves using EZ real-time data…see below

An Important Addition: *real-time data*



More real time data

Can be disaggregated By EZ economy



VAR/VECM Issues I

- Lag length?
  - AIC, HQ, SC...but parsimony wherever results are robust
- Series transformations?
  - All in log levels EXCEPT: SLOS, Spread, forecasted growth rate
  - Real GDP, GDP Deflator, loans ~ I(1)
  - SLOS, Comm. Prices, Spread, Policy rate, FCI ~ I(0)
- S.E. via MC

VAR/VECM Issues II

- What CI?
  - {policy rate – Loans}, {policy rate-SLOS}, {real GDP-Loans}
- Does the ordering matter?
  - [MACRO, CREDIT]: Core
  - [MACRO, DEMAND IDENTIFIERS, CREDIT]
    - Conventional IRFs & VDs + GIRFs

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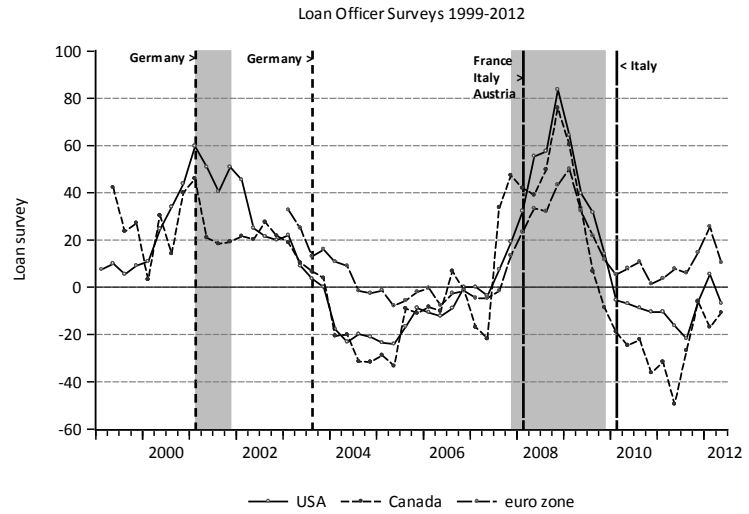
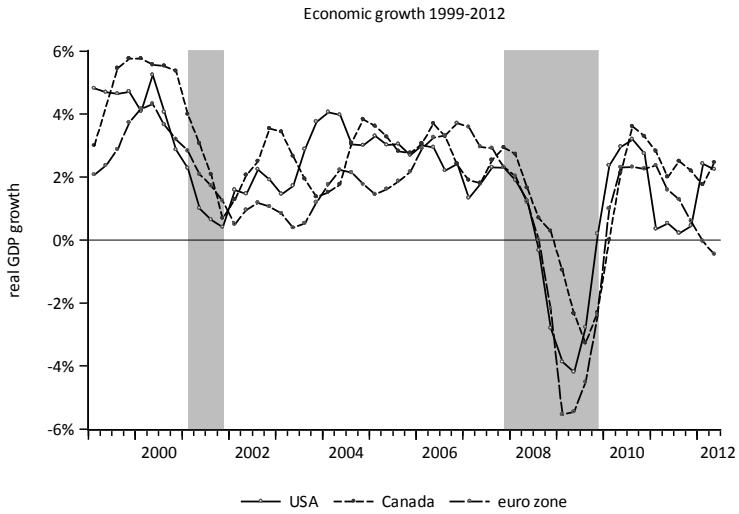
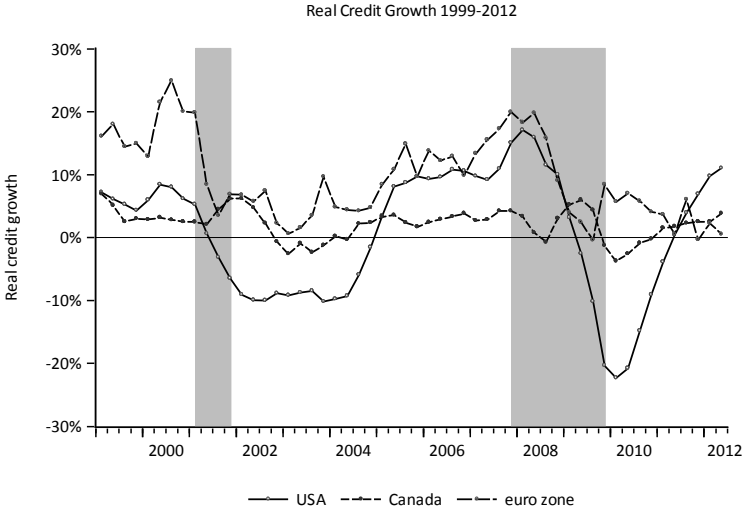
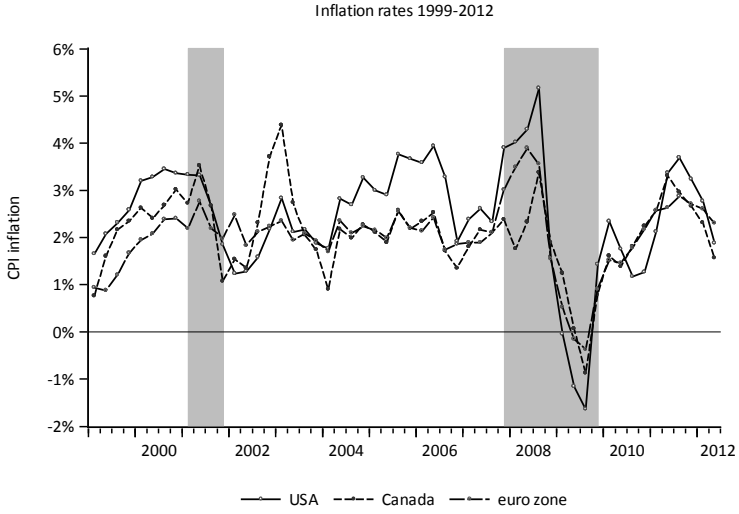
SELECTED EMPIRICAL RESULTS

Key Economic Aggregates:
Canada, the United States and the Eurozone

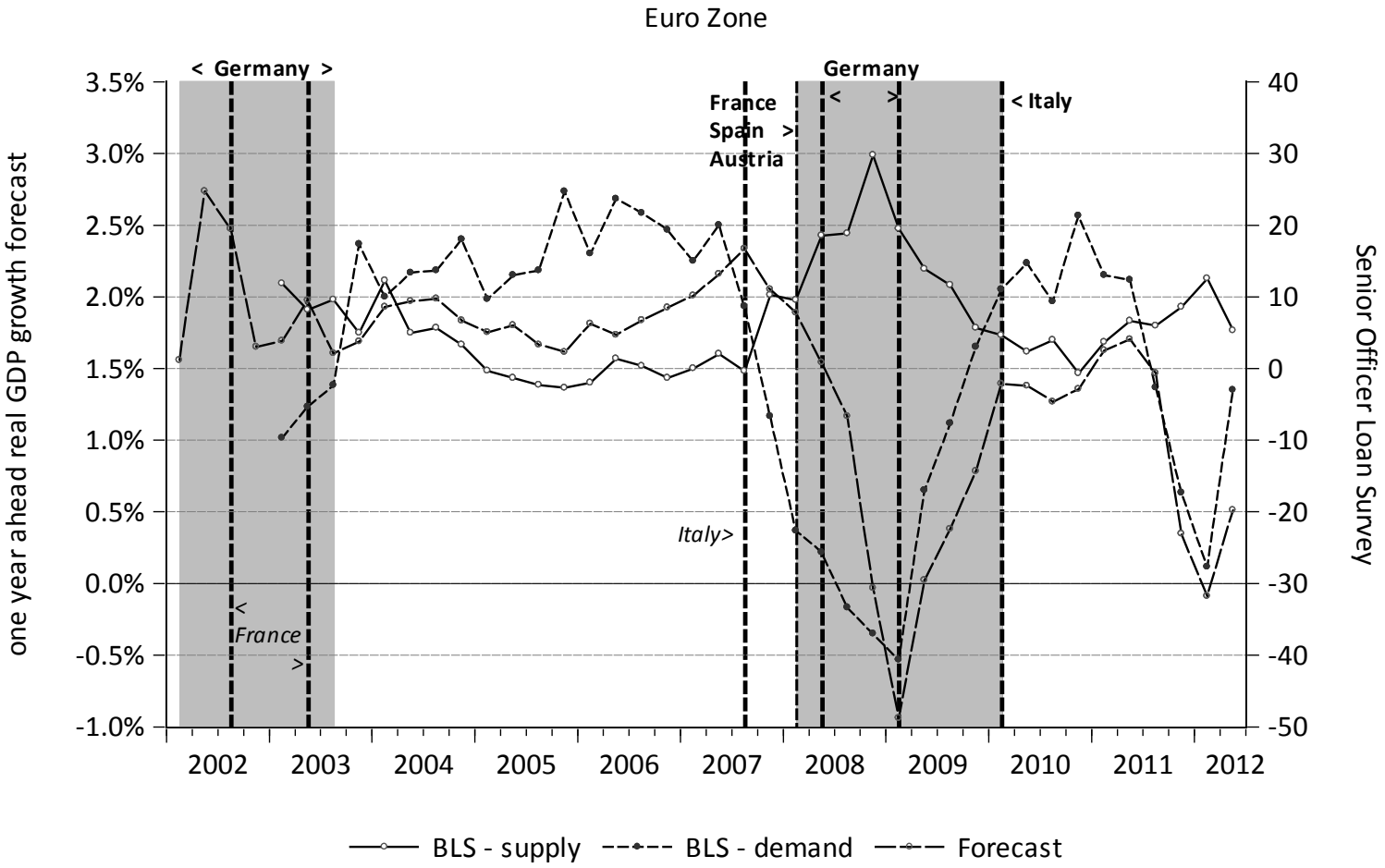








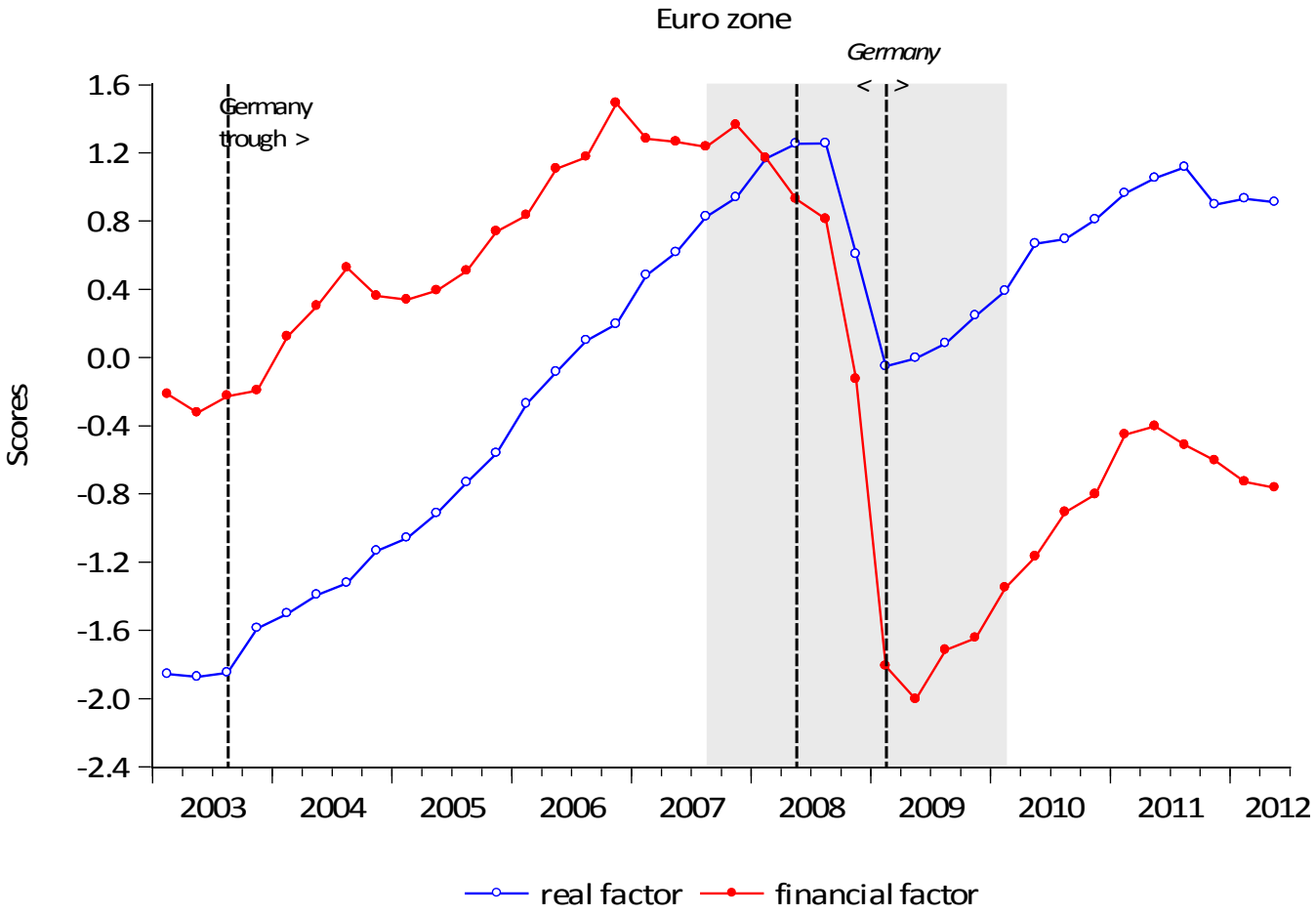
Senior Loan Officer Surveys and GDP Growth Forecasts: the Eurozone



Correlations: Loan Surveys, Credit and GDP Growth Forecasts, Canada, the United States and the Eurozone

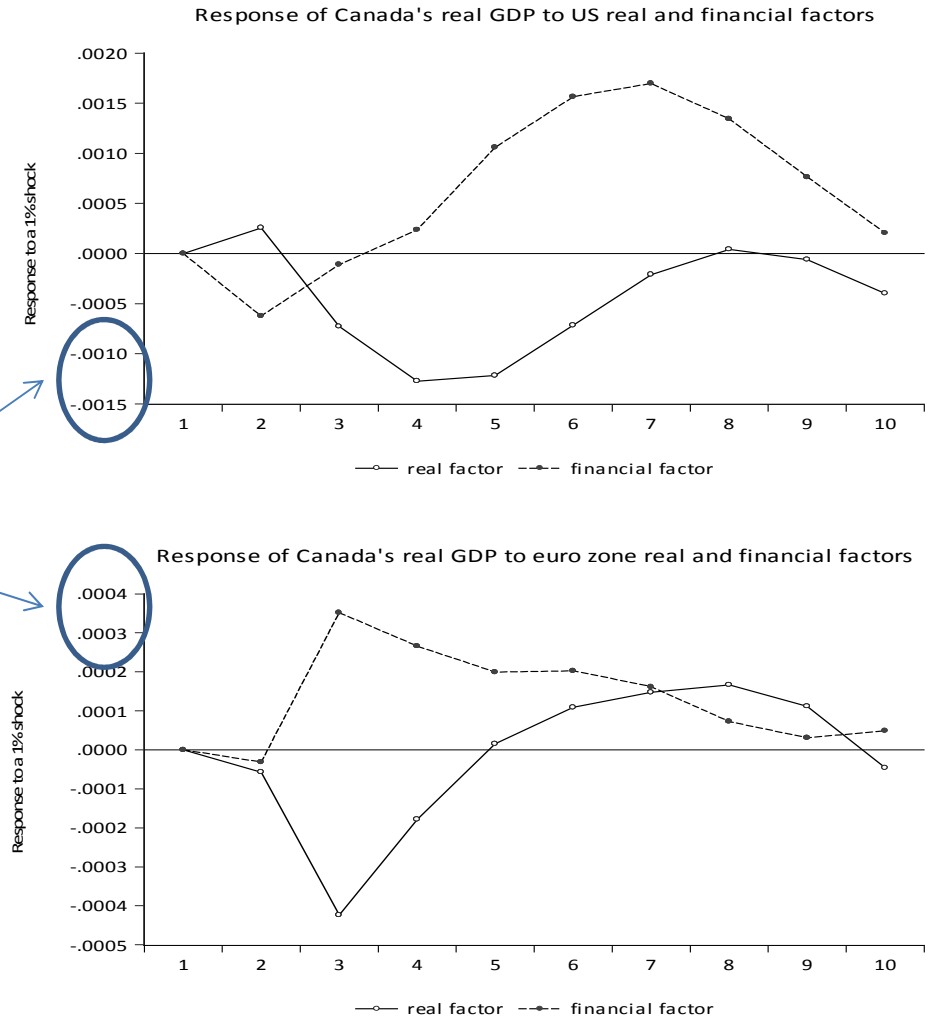
	Canada	United States	Eurozone
SLOS, GDP growth forecast	–0.31 (0.02)	–0.54 (.00)	–0.60 (.00)
SLOS, real credit	–0.31 (.02)	–0.54 (.00)	–0.60 (.00)

Real and Financial Factors: the Eurozone



“Impulse Responses” by Canada to US and Eurozone Shocks

Relative size of shocks quite different



Patterns broadly Comparable BUT cumulative US Impact larger

CONTAGION TESTS

GFC has a BIG impact

Contagion test	Sample 1	Sample 2	Sample 3
USA real to Canada real?	NO	YES	NO
Euro zone real to Canada real?	NO	YES	NO
USA financial to Canada financial?	NO	NO	NO
Euro zone financial to Canada financial?	NO	YES	NO
USA real & financial to Canada real?	NO	YES	NO
Euro zone real & financial to Canada real?	NO	YES	NO

#1: 2008Q3-2012Q2; #2: 2008Q1-2012Q2; #3: 2007Q1-2012Q2.

Factor Analysis: Eurozone

Not necessarily a N-S divide

A BC factor?

EZ MP factor?

	F1	F2	Communality
Austria	0.54	-0.20	0.33
Germany	0.02	0.50	0.25
Spain	0.33	0.78	0.72
France	0.41	0.56	0.47
Italy	0.96	0.25	0.98
Netherlands	0.54	0.37	0.43
Portugal	0.65	0.24	0.48

Proportion
0.73
0.27

Demand for loans: HOUSING

	F1	F2	Communality
Austria	0.48	0.27	0.30
Germany	-0.26	0.39	0.22
Spain	0.63	0.09	0.41
France	0.71	-0.10	0.52
Italy	0.30	0.27	0.16
Netherlands	0.03	1.00	1.00
Portugal	0.51	0.42	0.44

Proportion
0.50
0.50

Supply of credit: HOUSING

Domestic banking environment?

Not entirely clear yet how best to interpret these factors

Conclusions

- Incorporating credit conditions/frictions in macro models has a definite impact on inferences
  - There may, of course, be other ways of capturing financial frictions but more CB directly take account of this kind of data
- Changing credit conditions impact the macro-economy in ways insufficiently captured by CB policy rates
- In the EZ Demand vs Supply mis-matches may be far more important than for CAN or the US
- Unclear so far how large or persistent spillover effects inside the EZ are
  - Ongoing research will, hopefully, provide some answers