Private bank deposits and macro/fiscal risk in the euro area

Michael G. Arghyrou
University of Piraeus and Council of Economic Advisors

María-Dolores Gadea
University of Zaragoza

EconPol Conference, Brussels, 8 November 2019

Intra-EMU financial fragmentation

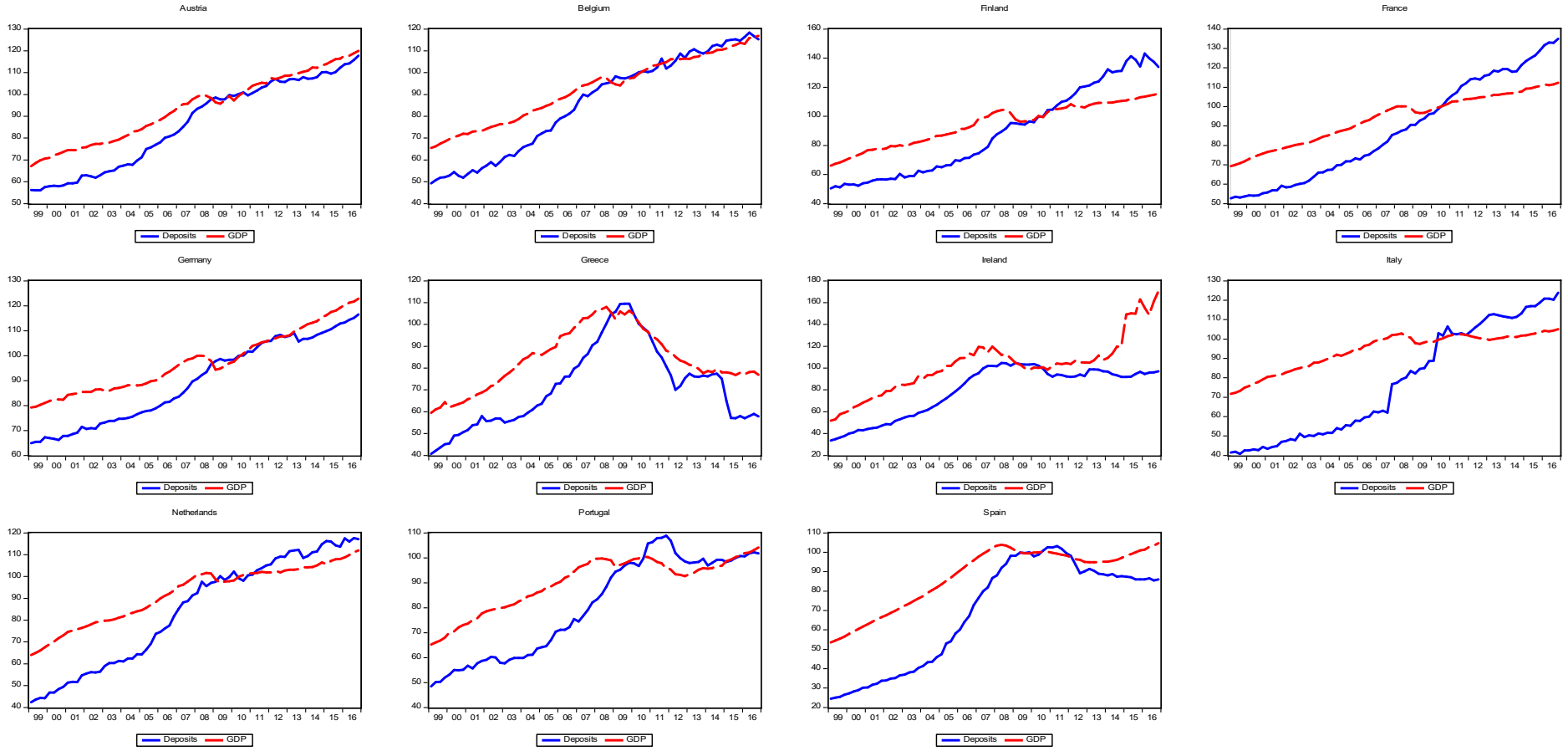
- Sovereign bond markets (Delatte et al 2017, Afonso et al 2018)
- Interbank money markets (Mayordromo et al 2015)
- Corporate bond markets (Zaghini 2016, 2017, De Santis 2018)
- Equity markets (Bley, 2009)
- Retail banking borrowing and lending rates (Arnold and Ewjik 2014, Rughoo and Sarantis 2014)

Literature on intra-EMU fragmentation has overlooked private bank deposits

- Surprising, given:

- Strong bias towards bank deposits in euro area, rendering deposits important for short- and long-term output movements (Ramirez, 2009)
- Policy focus on security of deposits, reflected in increased protection provided by national DGS (Engineer et al 2013, Demirgüç-Kunt et al, 2015) and debate on EDIS (European Commission 2015a, 2015b and Wolff 2016).
- Prima facie evidence that deposits present fragmentation (see Figure overleaf)
- Deposits are not recovering at the same speed with output, especially in the periphery

Private bank deposits, Jan 1999 – June 2017 (millions euro)



This paper:

- Focuses on under-researched fragmentation of bank deposits in euro area

- Tests three hypotheses:

a) Aggregated bank deposits relative to Germany determined by macro/fiscal risk factors
b) Relationship is time-varying
c) Time-variation driven by level of macro/risk

Market discipline model (Berger, 1991)

- Price/quantity discipline on banks undertaking excessive risk
- MD pre-requisite for long-run solvency of banking sector
- Hence, MD important policy objective
- Large body of literature providing empirical support for MD:
- Flannery (1998), Martinez Peria, and Schmukler (2001), Sironi (2003), Nier and Baumann, (2006) and Bennett et al (2015).

Market discipline and bank stability under systemic banking crises – I

- MD weakens within national banking systems during systemic banking crises (Cubilas et al, 2012)
- Depositors discipline domestic banking market as a whole by withdrawing deposits and depositing them in banks abroad (Kleimeier et al, 2013).
- Doubts about government's capacity to support distressed banks: Large banks seen as too-big-to-save: Demirgüç-Kunt and Huizinga, 2013, Bertay et al 2013
- TBTS especially strong if public finances are already weak: Demirgüç-Kunt and Huizinga 2013, Cubilas et al 2017.
- Strong feed-back between fiscal and banking risk, especially in EMU (Acharya et al. 2014, Bocola 2016 and other studies)

Market discipline and bank stability under systemic banking crises – II

- During fiscal/macro banking crises deposits determined by country's fiscal/macro risk, rather than idiosyncratic bank characteristics (Levy-Yeyati et al, 2010; Cubilas et al, 2012, 2017

- Mutation of MD from deposits' reallocation within national banking systems to international deposits substitution; and/or increasing holdings of cash (Levy-Yeyati et al, 2010).

- Both effects have been observed in euro area:

- Cross-border deposits substitution: Kleimeier et al (2013)
- Increased use of cash, particularly pronounced during the peaks of the global financial crisis in 2008 and in 2013-2015: Deutche Bank (2016) and Gros (2017)

Two-stage econometric approach

1. TVP panel methodology, modelling relative deposits on:

- Relative output expectations
- Relative fiscal risk
- HICP inflation differential

2. Model estimated TVP coefficients on:

- Level of risk factors
- Dummy capturing OMT effect (July 2012)
- Dummy capturing effects of introducing EBU (November 2014)

Data

- Sample countries: Austria, Belgium, Finland, France, Netherlands (core countries), Greece, Ireland, Italy, Portugal, Spain (periphery)
- Sample period: January 1999 – June 2017
- Private bank deposits index (in logs - excludes deposits of central government and MFIs). Source: ECB
- Economic sentiment indicator (in logs) relative to Germany (ESI). Source: Eurostat)
- 10-year government bond yields relative to Germany (Source: ECB)
- HICP inflation differential v Germany. Source: ECB

TVP econometric specification

$$Y_{it} = ft + \sum_{j=1}^{d} \beta_{tj} X_{it,j} + \alpha_i + \varepsilon_{it}$$

Y_{it} = Relative log-deposits index versus Germany

$X'_{it,j}$ = [esi, spread, inflation, hourse prices]

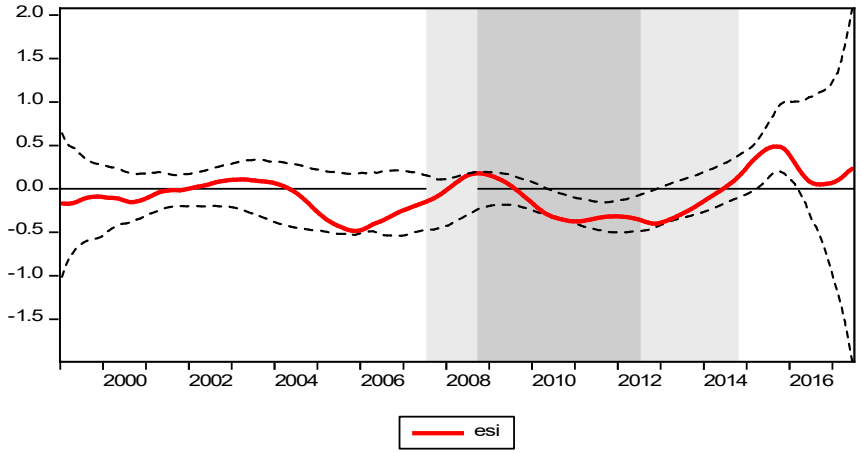
TVP model estimation

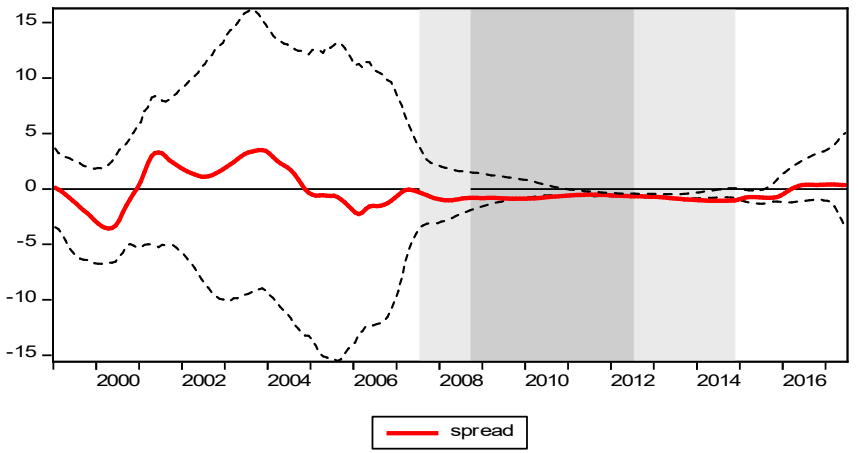
- Estimated using the local linear dummy variable approach (LLDV, Sun et al, 2009 and Li et al., 2011), including "boundary effect" correction by Dai and Sperlich (2010)

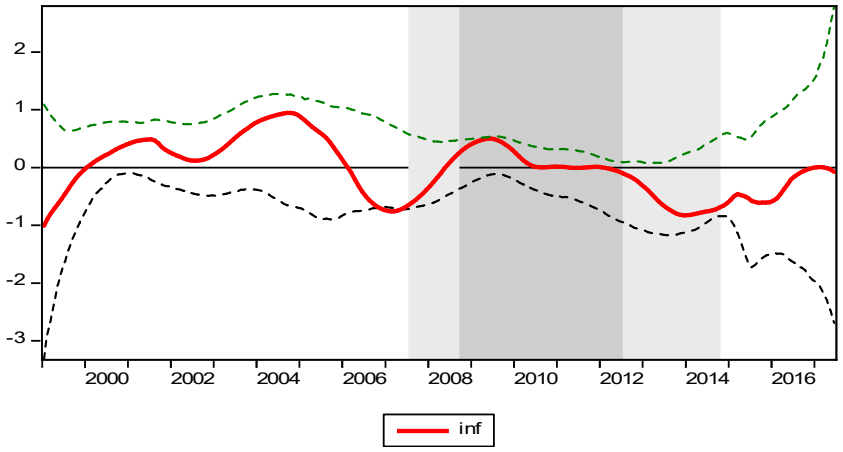
- Estimation bandwidth selected using the cross-validation method (see Sun et al., 2009 and Li et al., 2011)

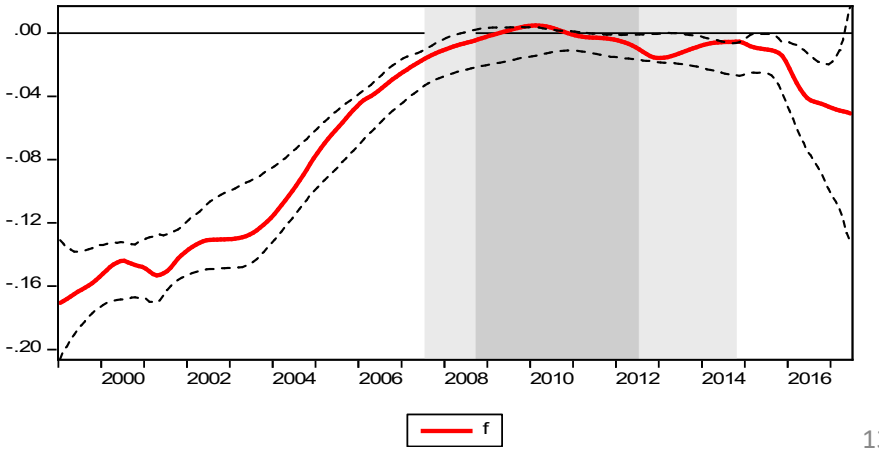
- 90% confidence intervals calculated using wild bootstrap on residuals of non-parametric estimated regression (1000 replications, same bandwidth and boundary effect correction used in source regression)

TVP estimates: Benchmark model, full panel

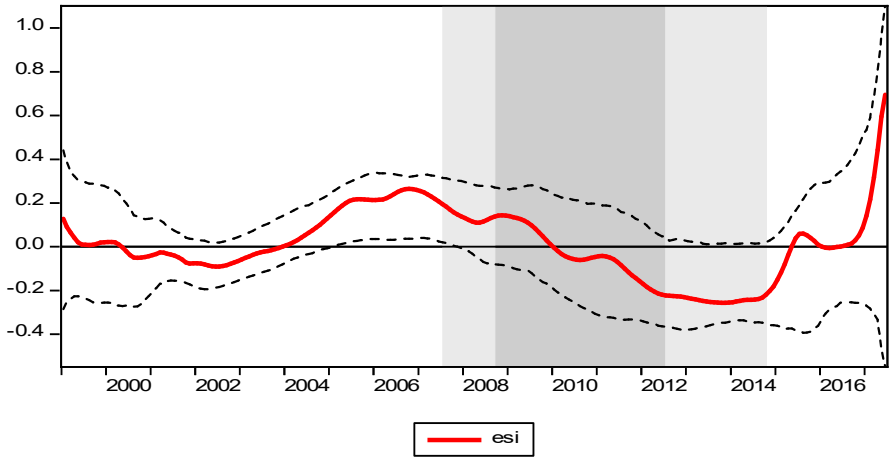


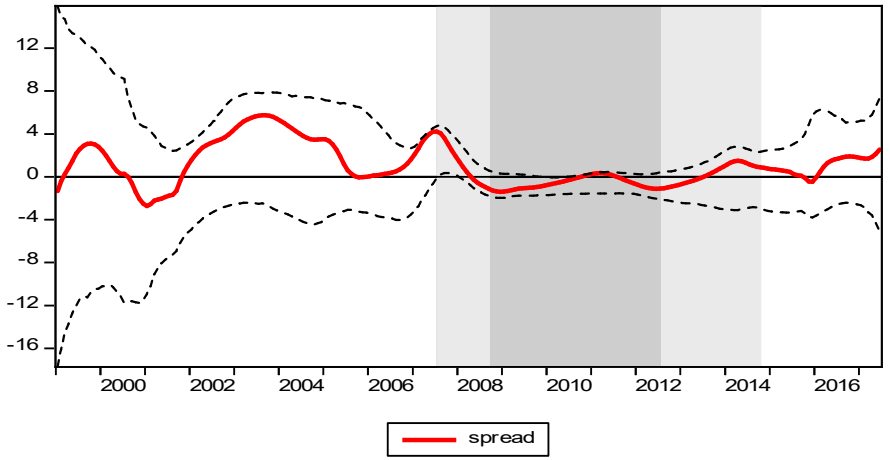


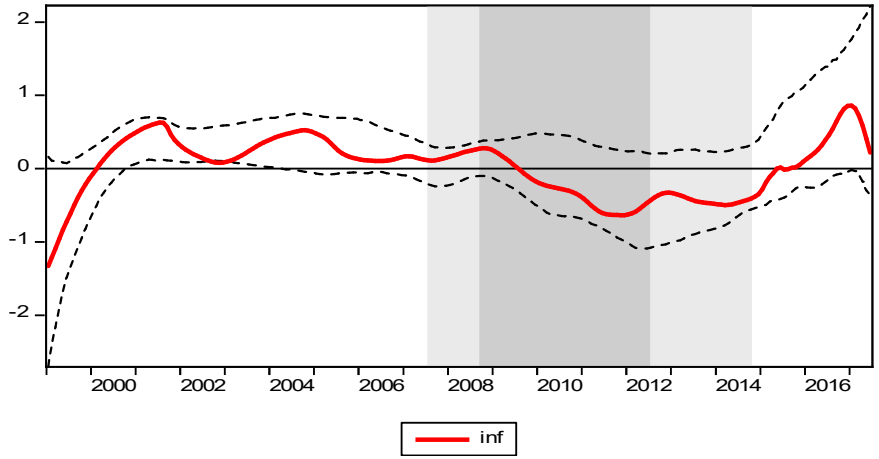


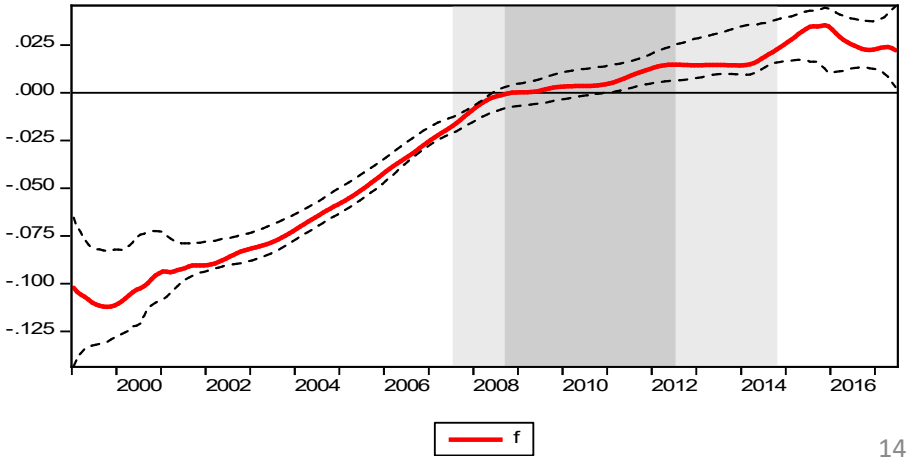


TVP estimates: Benchmark model, core countries

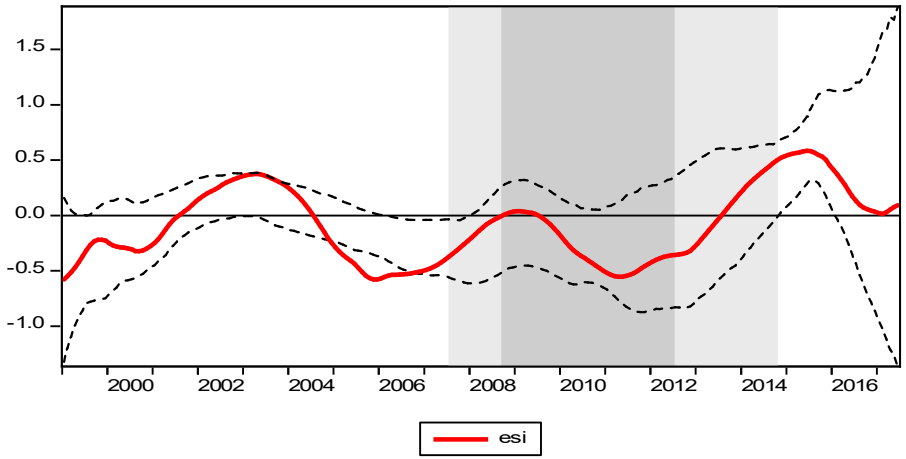


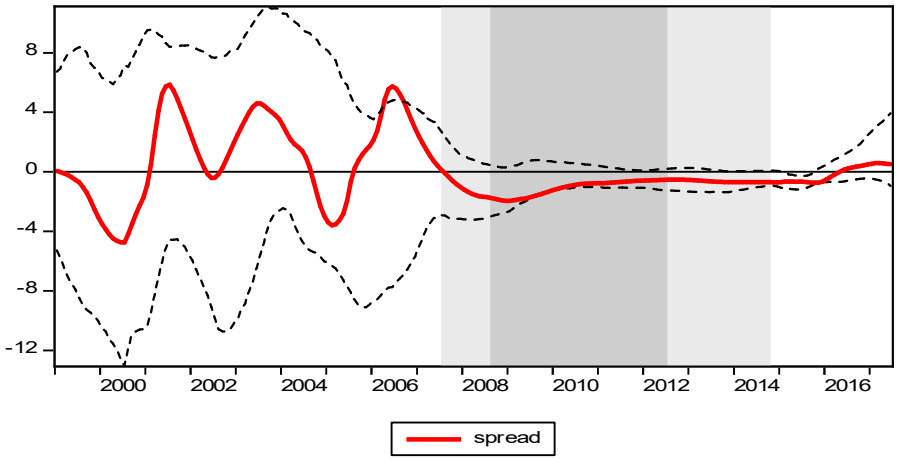


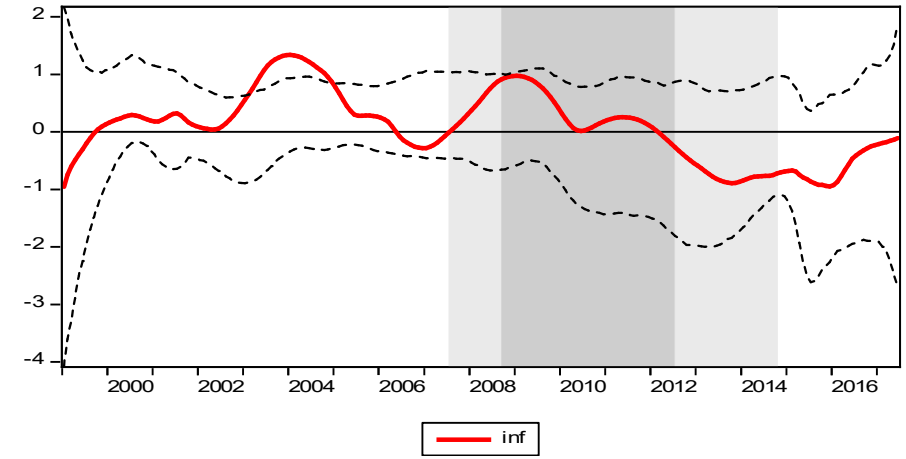


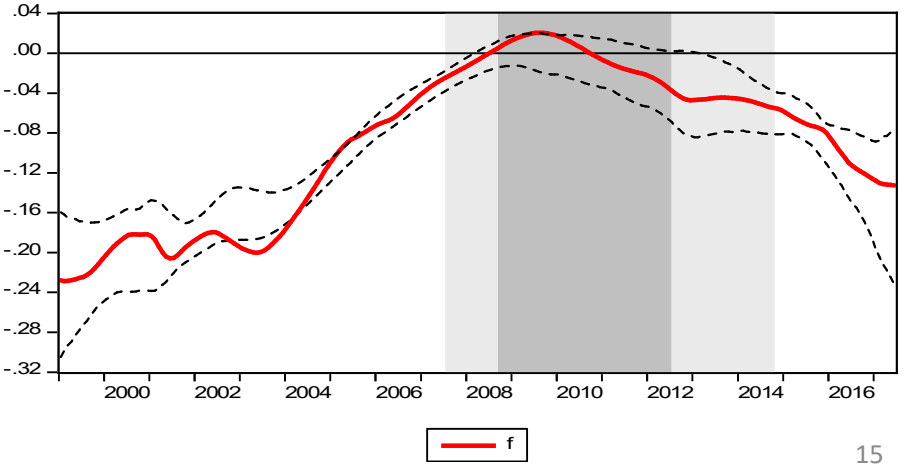


TVP estimates: Benchmark model, periphery

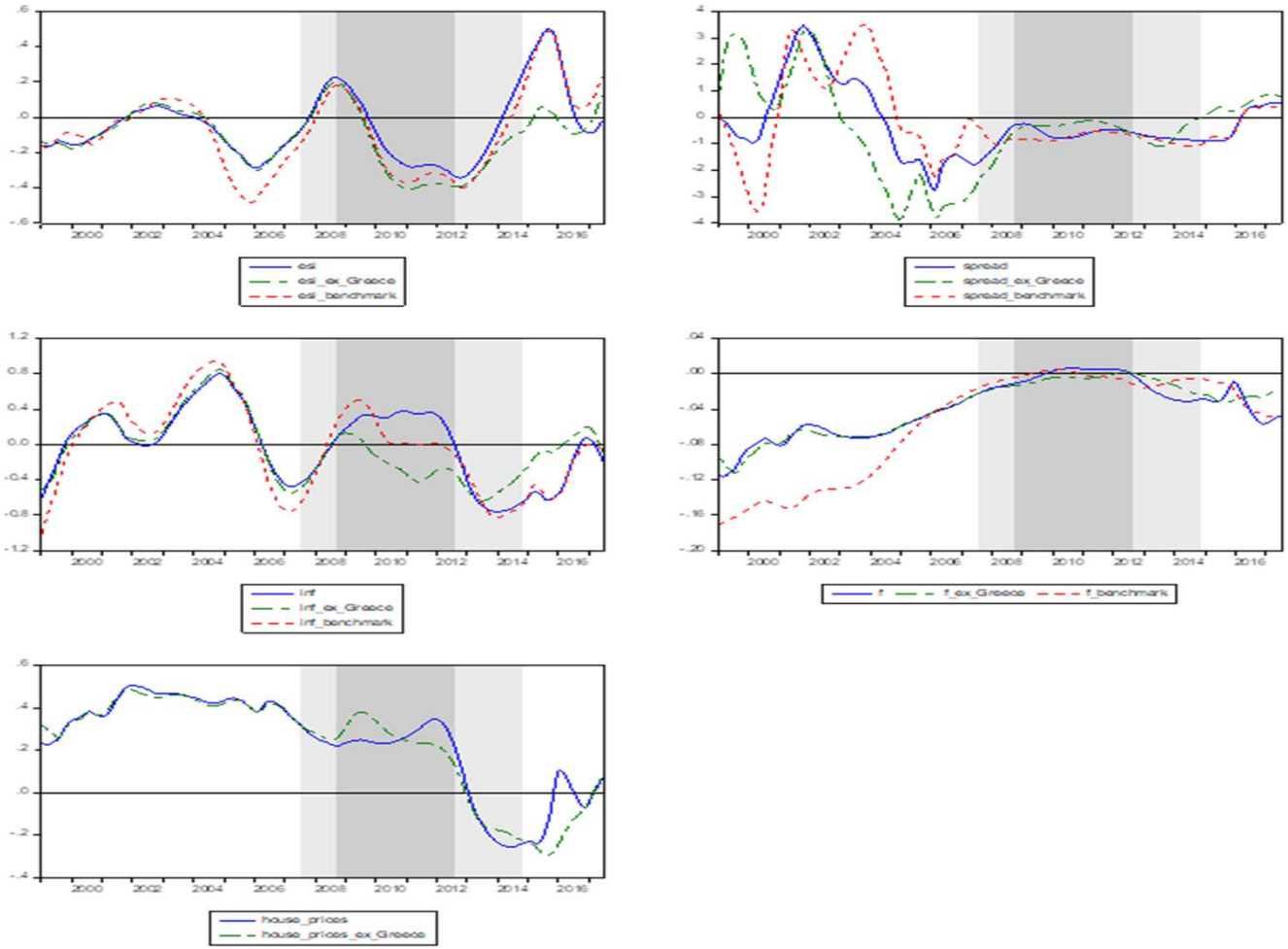




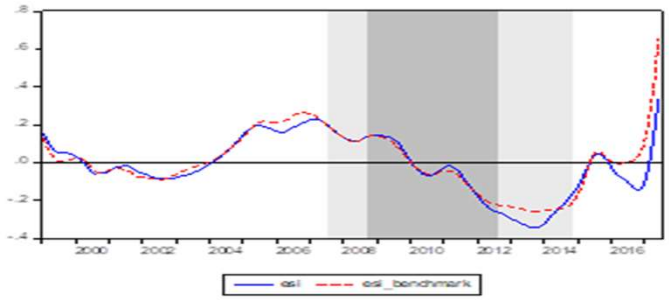


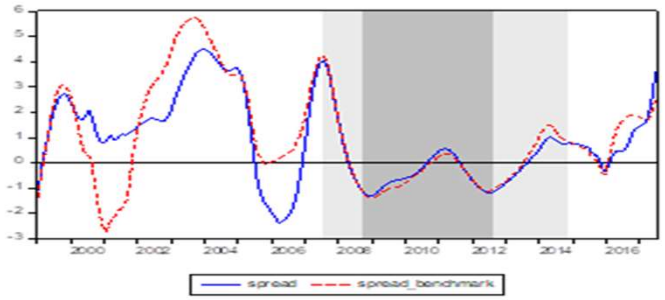


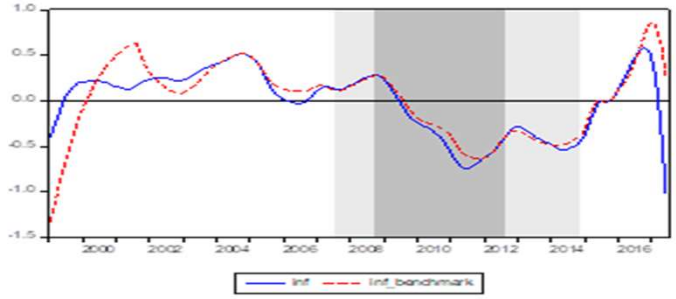
Adding log-house price differential against Germany (including and excluding Greece) versus benchmark model - Full panel

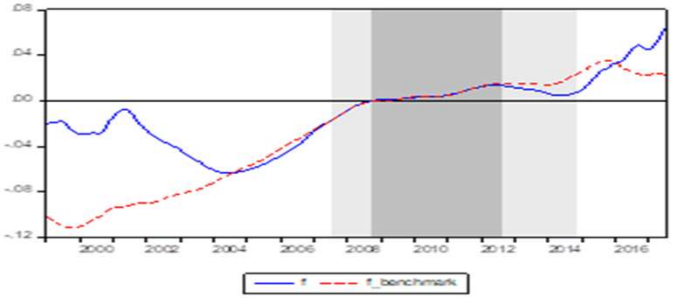


Adding log-house price differential against Germany versus benchmark model – Core panel

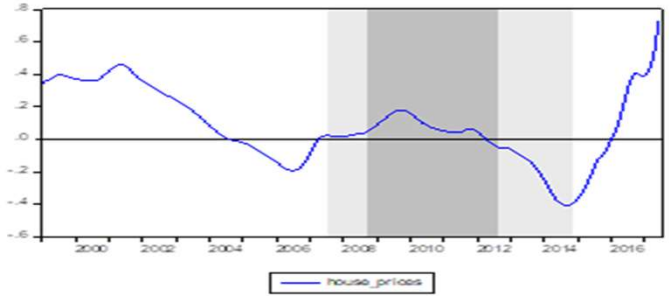




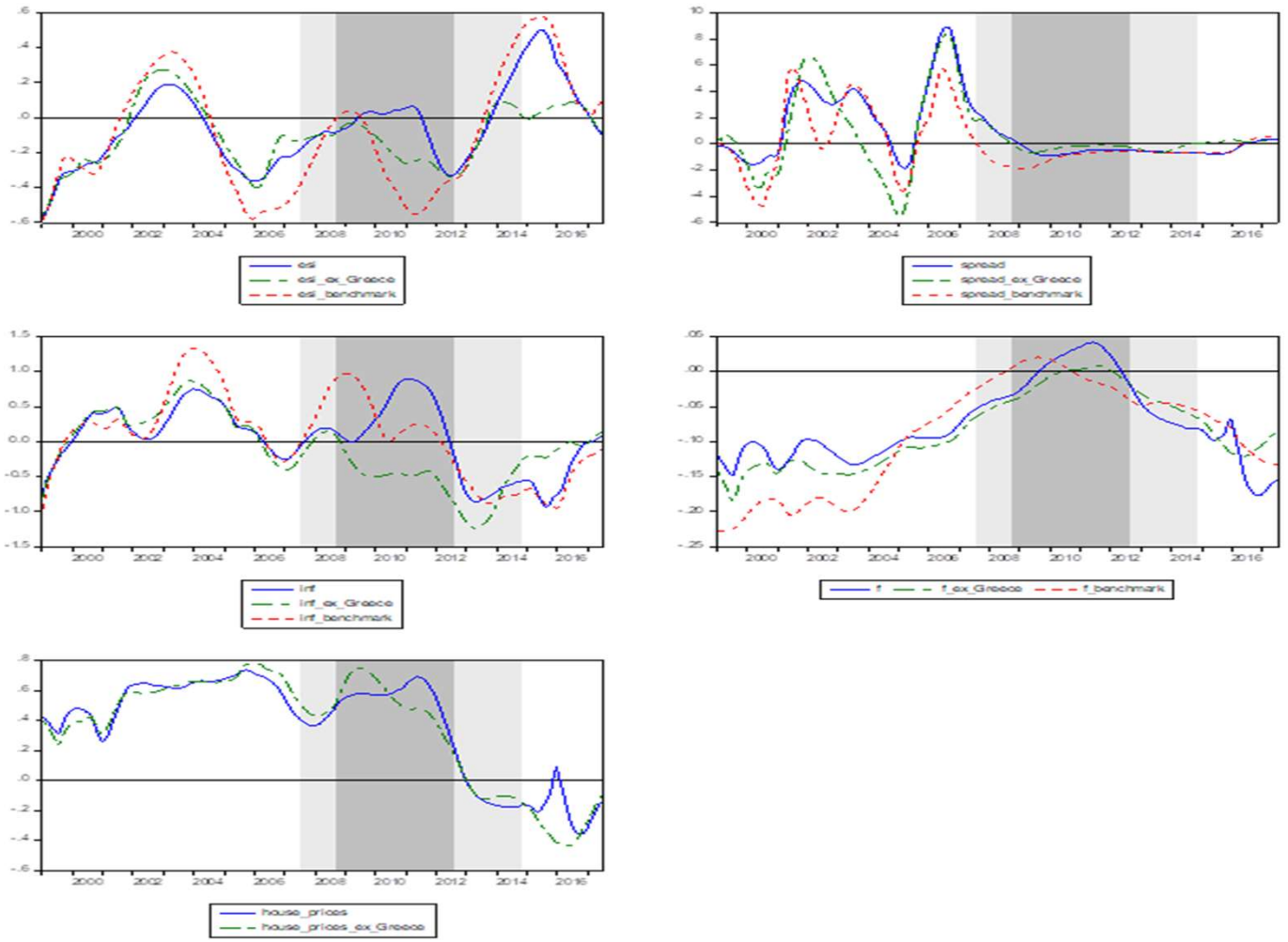




house_prices



Adding log-house price differential against Germany (including and excluding Greece) versus benchmark model - Periphery panel



Summary of empirical findings

- Time-varying relationship between relative deposits and macro/fiscal risk factors
- Response of former to latter declines fast during GFC (especially post Lehman Brothers) and intense phase of European Sovereign Debt Crisis (2009M10-2012M07)
- Finding consistent consistent across core and periphery
- But important differentiation in behaviour of trend function
- Mixed evidence regarding effect of OMT announcement
- Introduction of EBU followed by increases responsiveness of deposits to fundamentals in core countries but not in periphery countries

Modelling TVP coefficients on fiscal/macro risk

$$\hat{\beta}_{jt} = \gamma + z_t' + \varepsilon_t$$

- z_t = [esi_{t-1}, $spread_{t-1}$, inf_{t-1}, OMT, EBU]
- esi, spread, inf defined as first principle components of national series
- esi and inf orthogonalized to address collinearity

Modelling TVP parameters obtained from the benchmark model adding log-house price differential – Full panel

		β_t^{esi}			β_t^{spr}			β_t^{inf}			β_t^{hp}	
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
constant	-0.051* (0.028)	-0.050* (0.027)	-0.107*** (0.024)	-0.268 (0.187)	-0.272 (0.149)	-0.588*** (0.147)	0.006 (0.062)	0.005 (0.051)	0.159*** (0.057)	0.234*** (0.031)	0.234*** (0.019)	0.321*** (0.013)
spr_t	-0.016** (0.007)	-0.016** (0.007)	-0.021*** (0.005)	-0.032 (0.056)	-0.032 (0.045)	-0.081** (0.035)	-0.018* (0.021)	-0.010** (0.016)	0.016 (0.013)	-0.030** (0.013)	-0.030*** (0.008)	-0.013*** (0.003)
esi_t		0.000 (0.015)	0.244** (0.011)		0.351*** (0.086)	0.486*** (0.088)		0.122*** (0.354)	0.059** (0.030)		0.079*** (0.013)	0.042*** (0.007)
inf_t		-0.025** (0.011)	-0.004 (0.011)		0.278*** (0.058)	0.394*** (0.061)		0.066** (0.029)	0.010 (0.127)		0.055*** (0.011)	0.023*** (0.006)
OMT_t			0.065 (0.080)			0.918*** (0.345)			-0.740*** (0.108)			-0.352*** (0.049)
EBU_t			0.268*** (0.109)			0.473 (0.344)			0.310*** (0.116)			0.042 (0.054)
Adj-R^2	0.055	0.098	0.378	0.001	0.331	0.444	0.012	0.285	0.523	0.148	0.624	0.875

Modelling TVP parameters obtained from the benchmark model adding log-house price differential – Core panel

		β_t^{esi}			β_t^{spr}			β_t^{inf}			β_t^{hp}	
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
constant	-0.012 (0.019)	-0.012 (0.017)	0.031** (0.013)	0.863*** (0.213)	0.862*** (0.214)	0.800*** (0.292)	-0.009 (0.040)	-0.009 (0.034)	-0.053 (0.038)	0.085** (0.034)	0.084*** (0.029)	0.106*** (0.031)
spr_t	-0.038*** (0.010)	-0.039*** (0.008)	-0.024*** (0.008)	-0.379*** (0.104)	-0.379** (0.104)	-0.385*** (0.097)	-0.103*** (0.018)	-0.103*** (0.013)	-0.103*** (0.013)	-0.009 (0.009)	-0.009 (0.007)	0.002 (0.008)
esi_t		0.028** (0.014)	0.000 (0.012)		0.111 (0.071)	0.157 (0.110)		0.088*** (0.024)	0.122*** (0.030)		0.046** (0.018)	0.033* (0.195)
inf_t		-0.024** (0.010)	-0.033*** (0.007)		-0.007 (0.174)	-0.004 (0.178)		0.032* (0.017)	0.031* (0.016)		0.064*** (0.014)	0.057*** (0.012)
OMT_t			-0.291*** (0.035)			0.112 (0.435)			-0.014 (0.088)			-0.245*** (0.067)
EBU_t			0.238*** (0.044)			0.219 (0.410)			0.328** (0.131)			0.303** (0.126)
Adj.-R^2	0.270	0.388	0.653	0.222	0.226	0.222	0.367	0.510	0.584	0.001	0.217	0.333

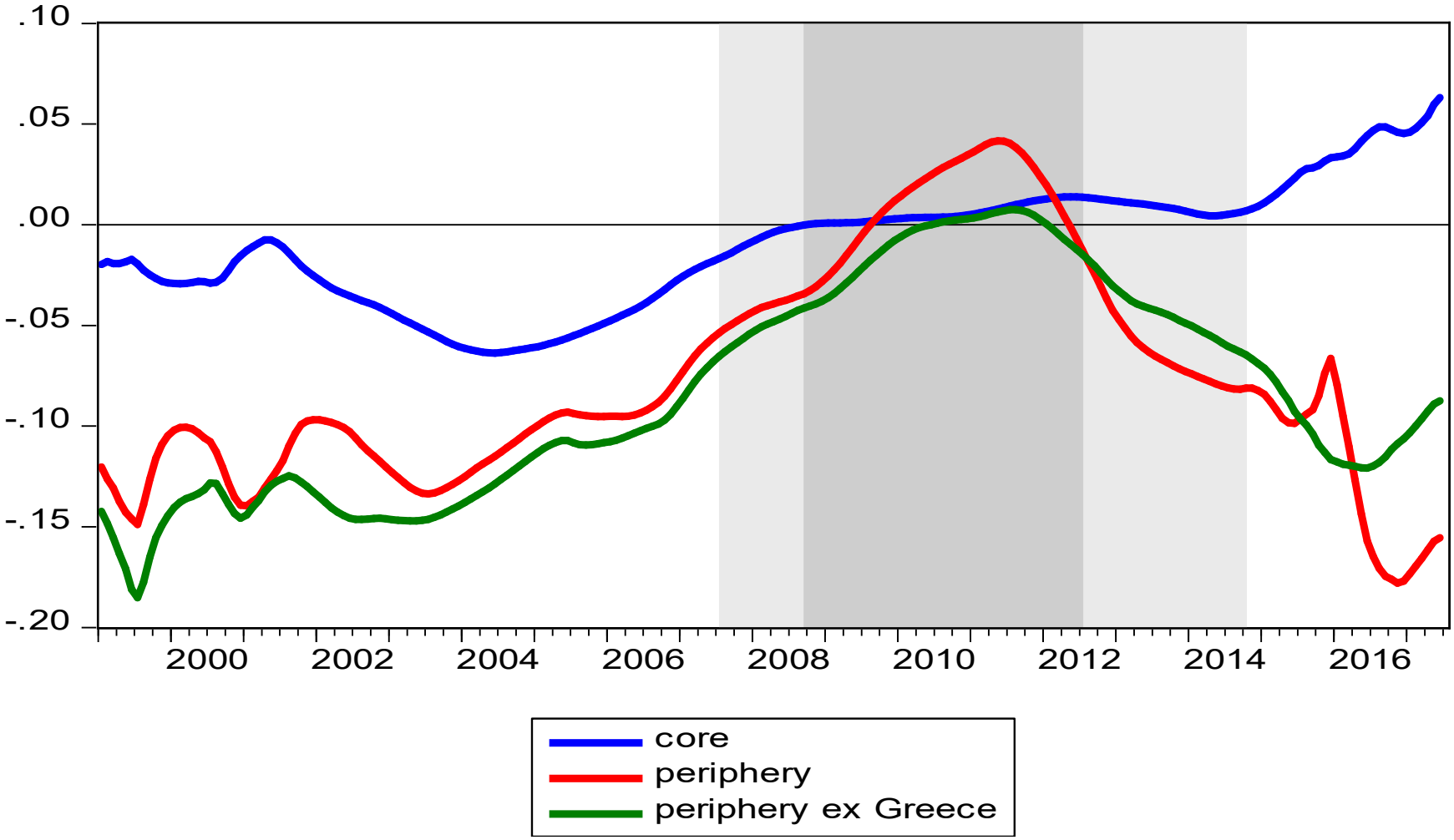
Modelling TVP parameters obtained from the benchmark model adding log-house price differential – Periphery panel

		β_t^{esi}			β_t^{spr}			β_t^{inf}			β_t^{hp}	
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
constant	-0.053 (0.033)	-0.053 (0.030)	-0.115*** (0.027)	0.918*** (0.324)	0.914*** (0.309)	0.979*** (0.368)	0.049 (0.071)	0.048 (0.059)	0.276*** (0.052)	0.365*** (0.048)	0.364*** (0.037)	0.554*** (0.022)
spr_t	0.003 (0.015)	0.003 (0.013)	-0.010 (0.012)	-0.476*** (0.127)	-0.476*** (0.108)	-0.470*** (0.119)	-0.032 (0.038)	-0.033 (0.032)	0.046* (0.025)	-0.052** (0.024)	-0.052*** (0.017)	0.002 (0.011)
esi_t		0.033 (0.027)	0.017 (0.024)		0.129 (0.239)	0.149 (0.245)		-0.055 (0.045)	-0.019 (0.038)		-0.009 (0.021)	0.027** (0.014)
inf_t		-0.050** (0.019)	-0.011 (0.021)		0.388*** (0.137)	0.345* (0.202)		0.156*** (0.030)	0.022 (0.026)		0.116*** (0.023)	0.001 (0.012)
OMT_t			0.106 (0.091)			0.012 (0.564)			-1.037*** (0.129)			-0.657*** (0.065)
EBU_t			0.235** (0.104)			-0.467 (0.288)			0.339** (0.152)			-0.093 (0.056)
Adj.-R^2	0.000	0.150	0.337	0.173	0.237	0.234	0.016	0.297	0.612	0.110	0.421	0.872

Summary of empirical findings

- TVP coefficients responsive to state of macro/fiscal fundamentals, mainly spreads and esi
- Role of inflation differential weaker and mixed, although most coefficients positive
- OMT has caused no positive effect or even negative effect in core countries (substitution effect)
- Mixed OMT effect in periphery countries (substitution v income effect)
- EBU has caused positive effect in core countries
- No EBU effect in periphery countries, except from one specification (even there, EBU effect weaker for periphery countries)
- Implication: Banking crisis has had a lasting effect in agents' confidence in periphery banking systems (see Osili and Paulson 2009 and Stix 2013)
- See figures of time effects below

Time effects – model adding log house price differentials



Summary of main findings

- Paper focused on intra-EMU fragmentation in banking deposits:
  - Aggregate relative deposits determined by macro/fiscal risk factors
  - Relationship between macro/fiscal risk is time-varying
  - Time variation driven by level of macro/fiscal risk

- Findings apply to full, core, and periphery panels
- Periphery-specific problem of reduced trust in local banking systems
- Deficit of trust unmitigated by OMT and EBU in its current form

Implications for EDIS – I

- EDIS supported as necessary for reducing fragmentation and increasing resilience of European banking systems
- Empirical findings supportive of this argument
- Fragmentation: Improvement of fiscal/macro risk not enough to restore quickly enough trust in periphery banking systems
- Argument supported by survey results (Crabtree, 2013) confirming significant lack of trust in periphery banks
- Resilience: Heavy fiscal legacy of crisis years implies that reduction in deposits can happen very fast in all countries, core and periphery

Implications for EDIS – II

- Further reduction in macro/fiscal risk through fiscal/structural reforms
- Enhancement of the pre-emptive and corrective arms of the EMU banking supervision/regulation framework through single supervision and resolution mechanisms
- Completion of the EBU through the introduction of EDIS
- Can result in a superior, incentives-compatible mix of risk-sharing and risk-reduction, towards reducing fragmentation and increasing resilience