Macroprudential Policies and Brexit: A Welfare Analysis

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Introduction

- On June 23, 2016, the UK decided via referendum to leave the EU
- The economic and institutional consequences of this decision for both the UK and the EU are still to come and they are surrounded by great uncertainty
- These are for sure challenging times to policy makers, who have to negotiate the terms and conditions and implement them afterwards

Economic Consequences of Brexit

- The economic consequences of Brexit have been widely studied
- Most studies published to date conclude that Brexit will reduce economic growth, although the scale of the predicted reduction varies widely
- While the Brexit-related analysis of many authors has focused on trade issues, the financial market perspective has been largely neglected

Financial Stability

- One of the issue that remains open to debate is how Brexit will affect macroprudential regulation and financial stability
- The cost of Brexit could become larger than studies suggest, due to the lack of cooperation in macroprudential supervision and economic policy that follows this event.
- The scale of these challenges depends heavily on the outcome of EU-UK negotiations.

Macroprudential policy in the UK

- In the UK, Parliament has given the Financial Policy Committee at the Bank of England responsibility for "the identification of, monitoring of, and taking of action to remove or reduce systemic risks with a view to protecting and enhancing the resilience of the UK financial system."
- However, in 2010, the EU created the European Systemic Risk Board (ESRB) to closely monitor the build-up of risks in the EU's financial system, and to issue warnings and recommendations to national and EU regulators if it believes action is necessary to preserve the stability of that system
- As part of the EU, the UK was falling under the supervision of the European Systemic Risk Board (ESRB)

Macroprudential Policy after Brexit

- Brexit brings a new macroprudential institutional framework; the ESRB loses its power over the UK
- According to the HM Treasury, "On exit day, the UK will no longer be subject to the jurisdiction of the ESAs and ESRB"

Research Question

- What are the welfare consequences, both for the UK and the EU, of the change in the macroprudential framework after Brexit?
  - I focus specifically on this issue and I abstract from other economic or political consequences of Brexit

Model Overview

- Two-country model (UK and EU)
- Microfounded DSGE with housing
- Heterogeneous households: Savers and borrowers
- Borrowers face a collateral constraint which is more or less tight depending on LTVs
- Monetary policy is national
- Macroprudential Policy: The LTV ratio follows a Taylor-type rule at a national level

Savers in UK

$$\max \; E_0 \sum_{t=0}^{\infty} \beta^t \left(\ln C_t^u + j_t \ln H_t^u - \frac{(L_t^u)^\eta}{\eta} \right)$$

s.t.

$$C_{UKt}^u + \frac{P_{EUt}}{P_{UKt}} C_{EUt}^u + q_t \left(H_t^u - H_{t-1}^u \right) + b_t^u + R_{EUt-1} e_t d_{t-1} \leq$$
$$w_t^u L_t^u + \frac{R_{UKt-1} b_{t-1}^u}{\pi_{UKt}} + e_t d_t + F_t + S_t$$

Borrowers UK

- $\widetilde{\beta} < \beta$ and need to collateralize their debt
- α_{UK} of them borrow at a variable rate, the rest at a fixed rate
- Maximize utility function subject to BC + an extra collateral constraint:

$$E_t \frac{R_{UKt}}{\pi_{UKt+1}} b^{cv}_{UKt} \leq k_{UKt} E_t q_{t+1} H^{cv}_{UKt}$$

$$E_t \frac{\overline{R}_{UKt}}{\pi_{UKt+1}} b^{cf}_{UKt} \leq k_{UKt} E_t q_{t+1} H^{cf}_{UKt}$$

- Collateral constraint holds with equality⇒economy is endogenously divided into borrowers and savers

Financial Intermediary in UK

- Accepts deposits, and extends both fixed and variable-rate loans to consumers
- Optimality condition for setting the fixed interest rate implies that at each point in time, the intermediary is indifferent between lending at a variable or at a fixed rate
- The fixed interest rate is a weighted discounted average of all future variable rates (it is a long-term rate)
- Financial markets clear$\Rightarrow$domestic savings=domestic borrowings

Firms in UK

- Firms produce consumption goods
- Sticky prices⇒Phillips Curve (Monetary policy has real effects)
- Housing supply is fixed, for simplicity

Monetary Policy

- Taylor rule responds to inflation

$$R_{UKt} = (R_{UKt-1})^{\rho} \left(\pi_{UKt}^{(1+\phi_{\pi})} R_{UK} \right)^{1-\rho} \varepsilon_{UKR,t}$$

$$R_{EUt} = (R_{EUt-1})^{\rho} \left(\pi_{EUt}^{(1+\phi_{\pi})} R_{EU} \right)^{1-\rho} \varepsilon_{EUR,t}$$

Calibration (1)

Common Parameter Values		
β	.99	Discount Factor for Savers
$\widetilde{\beta}$	.98	Discount Factor for Borrowers
j	.1	Weight of Housing in Utility Function
η	2	Parameter associated with labor elasticity
γ	.7	Labor share for Savers
X	1.2	Steady-state markup
θ	.75	Probability of not changing prices
ρ	.8	Interest-Rate-Smoothing Parameter in Taylor Rule
ϕ_π	.5	Inflation Parameter in Taylor Rule
ψ	.0001	Adjustment Cost Net Foreign Assets

Calibration (2)

Country-Specific Parameter Values			
	UK	**EU**	
k	0.72	0.78	Average LTV
α	0.54	0.28	Proportion of variable rates
n	0.16	0.84	Country size

Differences in Calibration

- The financial accelerator should be more powerful in the EU than in the UK, given that the LTV in the former economy is higher
- Variable-rate mortgages in the UK, as opposed to mostly fixed rates in the large countries of the EU
- The UK is a relatively small economy as compared to the EU

Simulations (1)

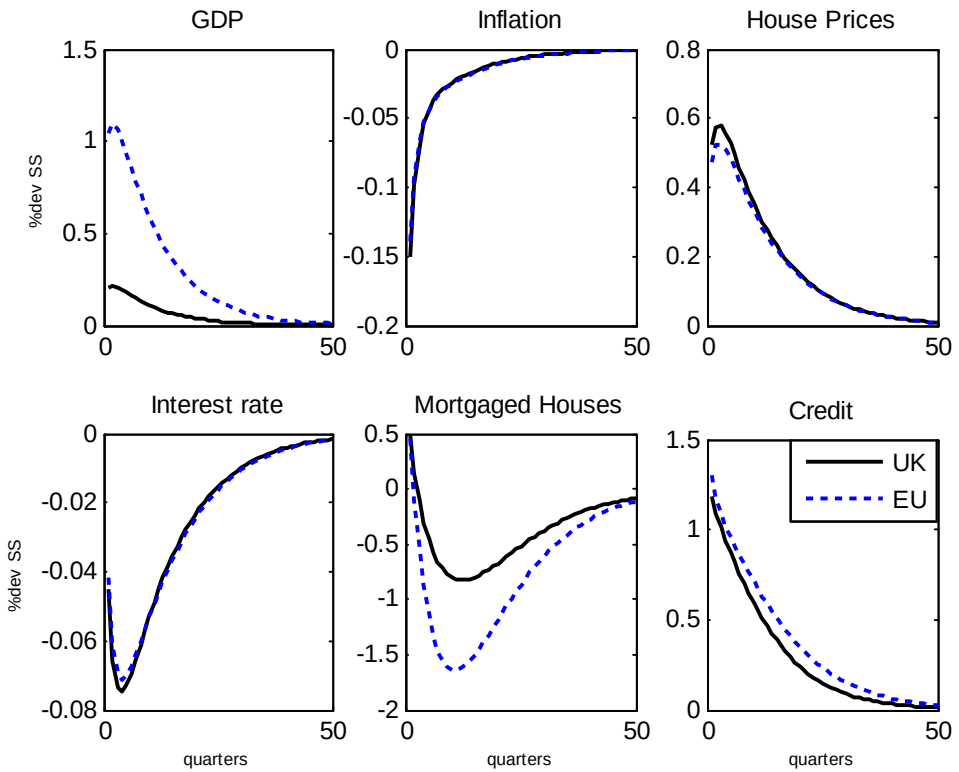

Figure: Impulse Responses to a Symmetric Productivity Shock. UK vs. EU

Simulations (2)

- The same productivity shock impacts more strongly the EU than the UK
- Even though the shock is symmetric, the effects on financial markets and even on the real economy are not symmetric
- This may advocate for macroprudential policies that are set independently, according to country-specific needs
  - Before Brexit, the UK is restricted to the supervision of the ESRB
  - After Brexit, however, the UK has the chance to implement a non-coordinated macroprudential policy

Macroprudential Policy in the EU

- Some macroprudential measures, including changes in LTVs are set at a national level in the EU
  - However, they are supervised and coordinated by the ESRB and the ECB
- As part of the EU, the UK was under the supervisory umbrella of the ESRB
  - However, after Brexit, this is no longer the case and no official coordination is taking place

Macroprudential Policy in the model

- I consider two regions setting macroprudential policy independently
  - In the pre-Brexit scenario, both regions coordinate when implementing their policies, in the sense that optimal policies aim at maximizing social welfare
  - Post-Brexit, each region maximizes their own welfare
- I compare the two scenarios in terms of optimality of policies, welfare and macroeconomic and financial stability

Macroprudential Policy Rules

$$k_{UKt} = k_{SSUK} \left(\frac{b_t}{b} \right)^{-\phi^b_{UK}} \left(\frac{Y_{UKt}}{Y_{UK}} \right)^{-\phi^y_{UK}}$$

$$k_{EUt} = k_{SSEU} \left(\frac{b^*_t}{b^*} \right)^{-\phi^b_{EU}} \left(\frac{Y_{EUt}}{Y_{EU}} \right)^{-\phi^y_{EU}}$$

Welfare

- Second order approximation of future stream of utility of each agent
- Aggregate across agents and countries
- Present results in consumption equivalents

Some intuition

- The majority of borrowers in UK take mortgages at a variable interest rate, while borrowers the large countries of the EU do it at a fixed rate
  - A macroprudential policy responding to macroeconomic changes may compensate the lack of effectiveness of monetary policy
- The LTV ratio dictates the strength of the financial accelerator, since it is directly related to the tightness of the collateral constraint
  - A stronger financial accelerator may make it optimal for macropru to respond to output

=>Optimal macropru in the EU should be more aggressive than in the UK and respond to output

Optimal Macroprudential Policy

Optimal Macroprudential Policy				
	Coordinated (Pre-Brexit)		Brexit	
	ϕ^b	ϕ^y	ϕ^b	ϕ^y
UK	0.11	0.60	0.15	0
EU-27	0.92	1.95	0.92	1.95
EU-28	-	-	-	-

Reaction Parameters

- In the country with fixed rates and higher LTVs, that is the EU, macroprudential policies respond more aggressively to output
- Both pre-Brexit and after Brexit, it is optimal for the UK to perform a less aggressive macroprudential policy than the one in the EU
- Pre-Brexit, although to a lower extent, the UK also responds more aggressively to output than to credit because it needs to take into account welfare of the whole EU and accommodate to its features
    - After Brexit, it is not optimal for UK macroprudential policy to respond to output
- Brexit does not affect the optimal policy making in the EU, given the UK small comparative weight

Volatilities

Volatilities

	Coordinated (Pre-Brexit)			Brexit		
	σ_b	σ_y	σ_π	σ_b	σ_y	σ_π
UK	1.9488	0.5703	0.2543	1.4245	0.5662	0.2611
EU-27	10.2526	3.0181	0.2547	10.2389	2.9965	0.2608
EU-28	-	-	-	-	-	-

Financial Stability

- After Brexit, the UK enjoys a substantial improvement in financial stability, while macroeconomic stability is not highly compromised
  - Given the high proportion of variable-rate mortgages in the UK, monetary policy does not need to be complemented by macroprudential policy
  - The Tinbergen principle applies and there can be a separation of objectives; macroprudential policies can take care of financial stability while monetary policy focuses on macroeconomic stability

Welfare Gain

Welfare Gain		
	Coordinated (Pre-Brexit)	Brexit
		Welf Gain
UK	-	0.6510
EU-27	-	-0.0742
EU-28	-	-0.0018

Welfare

- The UK obtains a welfare gain from not being restricted anymore by the supervision of the European regulator and being able to optimize its macroprudential policy taking into account its own welfare
- The benefits of much higher financial stability outweigh the cost of a slight higher inflation variability
- The EU is just slightly worse off with Brexit because inflation variability is slightly higher

Conclusions (1)

- I use a two country DSGE model to address the following research question: How do optimal macroprudential policy and financial stability change after Brexit, both for the UK and the EU?
- Macroprudential policy is proxied by a rule on the LTV that responds to both credit and macroeconomic developments
  - The pre-Brexit macroprudential scenario, in which the UK is supervised by EU macroprudential authorities, is captured by a situation in which the UK sets its optimal policy maximizing EU welfare
  - In the Brexit situation, optimal macroprudential policy is set independently, taking into account its own welfare.

Conclusions (2)

- It is optimal for the UK to have a less aggressive macroprudential policy than the EU
- After Brexit, the UK is better off by setting its own macroprudential policy
  - When taking into account only its own welfare, the UK optimal macroprudential policy advocates for the Tinbergen principle, focusing on credit developments and not taking into account output
  - This is mainly due to the fact that in the UK, the majority of consumers borrow at a variable rate and its LTV is lower than the EU counterpart.