Discussion of “Monetary and Macroprudential Policy Games in a Monetary Union” by R. Dennis and P. Ilbas

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Institutional context

- The recent crisis has highlighted the need for a **macroprudential** policy to ensure financial stability.
- Macroprudential-policy instruments will be set conditionally on the state of the economy [Basel Committee on Banking Supervision (2010)].
- This raises the issue of the **interactions** between monetary and macroprudential policies [see, e.g., IMF (2012, 2013)].
- On this issue, the euro area has some **specificities**:
  - a single monetary authority (ECB),
  - national macroprudential authorities,
  - a common macroprudential authority (ESRB and ECB).

Overview of the paper and outline of the discussion

- The paper studies the **game** between monetary and macroprudential authorities in a DSGE model of a monetary union.
- The **model** is Quint and Rabanal's (2014):
  - with two countries,
  - with intra- and inter-national financial frictions,
  - estimated on euro-area data.
- In my **discussion**, I will
  1. place the paper in the related literature,
  2. discuss the results obtained,
  3. make some suggestions.

Contribution of the paper

- The authors cite **two papers** about monetary and macroprudential policies in a monetary union:
  - Brzoza-Brzezina, Kolasa, and Makarski (2015),
  - Quint and Rabanal (2014).
- Against the background of these two papers, they view their **original contribution** as being about games with three players.
- There are many **other papers** about monetary and macroprudential policies in a monetary union.
- Against the background of all these papers, I view their original contribution as being about
  - games with three players,
  - Stackelberg games,
  - optimal discretionary policies.

Related papers

Papers about monetary and macroprudential policies in a monetary union

Code	Authors	Year	Status
BBKM	Brzoza-Brzezina, Kolasa & Makarski	2015	p
DG	Dehmej & Gambacorta	2015	wp
DI	Dennis & Ilbas	2016	wp
PS	Palek & Schwanebeck	2015	wp
PV	Poutineau & Vermandel	2016	p
QR	Quint & Rabanal	2014	p
R	Rubio	2014	wp
RCG	Rubio & Carrasco-Gallego	2015	wp
S	Sergeyev	2016	wp

Status: p = published; wp: working paper.

Some features of these papers

Paper	Nature of the results	Objective functions	Max. number of players...	...with diff. objectives	Nash or Stack.	Discretion vs. rules
BBKM	NC	AH & W	1	1	I	Ru
DG	A	AH	3	3	N	I
DI	NE	AH	3	3	N & S	D
PS	NC	W	3	1	N	D & Ru
PV	NE	W	3	1	N & S	Ru
QR	NE	W	3	1	N	Ru
R	NC	W	3	1 or 3	N	Ru
RCG	NC	W	3	1 or 3	N	Ru
S	A	W	3	1 or 3	N	Ra

Nature of the results: A: analytical; NC: numerical based on a calibration; NE: numerical based on an estimation. **Objectives**: AH = ad hoc; W = welfare. **Nash or Stack.**: I: irrelevant; N: Nash; S: Stackelberg. **Discretion vs. rules**: D = discretion; I = irrelevant; Ra = Ramsey; Ru = rules.

Cases considered

Union-wide MP

Timing	Cooperation	No cooperation
Nash	x	x
CB leader	x	x
MP leader	x	x

Regional MPs

Timing	Cooperation	No cooperation
Nash	x	x
CB leader, MPs followers	x	x

Nash vs. Stackelberg under cooperation I

- Nash and Stackelberg give “qualitatively and quantitatively **similar**” results under cooperation:

L^{coop} under cooperation (union-wide MP)

Nash	CB leader	MP leader
2.150	2.158	2.164

- Shouldn’t they give exactly **identical** results?

- In static games, any Stackelberg equilibrium is a Nash equilibrium when the players have the same objective.

- Isn’t it also the case in dynamic games under discretion?

Nash vs. Stackelberg under cooperation II

- Let $L(r, \eta)$ be the common loss function, abstracting from dynamics and discretion.
- Nash:

$$\frac{\partial L}{\partial r} = 0 \quad \Leftrightarrow \quad r = f(\eta),$$
$$\frac{\partial L}{\partial \eta} = 0 \quad \Leftrightarrow \quad \eta = g(r).$$

- CB leader:

$$\frac{\partial L}{\partial \eta} = 0 \quad \Leftrightarrow \quad \eta = g(r),$$
$$\frac{\partial L}{\partial r} + \frac{\partial L}{\partial \eta} g' = 0 \quad \Leftrightarrow \quad \frac{\partial L}{\partial r} = 0 \Leftrightarrow r = f(\eta).$$

- So the two **coincide** with each other.

Cooperation vs. no cooperation under Nash

L^{coop} under Nash (union-wide MP)

Objectives	Cooperation		No cooperation
Benchmark	2.150	$<$	2.179
Credit to GDP as common goal	2.150	$<$	2.213
Spread instead of credit to GDP	4.843	$<$	5.275

- Cooperation: $\frac{\partial L^{coop}}{\partial r} = \frac{\partial L^{coop}}{\partial \eta} = 0$.
- No cooperation: $\frac{\partial L^{cb}}{\partial r} = \frac{\partial L^{mp}}{\partial \eta} = 0$.
- Since $L^{coop} = L^{cb} + L^{mp}$, these results can obtain only if $\frac{\partial L^{cb}}{\partial \eta} \neq 0$ or $\frac{\partial L^{mp}}{\partial r} \neq 0$.
- So **cooperation forces them to internalize some externalities.**

Nash vs. Stackelberg under no cooperation

L^{coop} under no cooperation (union-wide MP)

Objectives	CB leader		Nash		MP leader
Benchmark	2.210	$>$	2.179	$<$	2.224
Output growth as common goal	2.156	$>$	2.142	$<$	2.185
Credit to GDP as common goal	2.238	$>$	2.213	$<$	2.242
Spread instead of credit to GDP	5.277	$>$	5.275	$<$	5.285

- Since $L^{coop} = L^{cb} + L^{mp}$, these results say that **the first-mover advantage is lower than the last-mover disadvantage**.

The effects of discretion I

L^{cb} under no cooperation (union-wide MP)

Objectives	Nash		CB leader
Benchmark	2.108	$<$	2.112
Output growth as common goal	1.121	$<$	1.123
Credit to GDP as common goal	2.159	$<$	2.164
Spread instead of credit to GDP	5.238	$<$	5.239

L^{cb} under no cooperation (regional MPs)

Objectives	Nash		CB leader
Benchmark	2.107	$<$	2.111
Regional output growth as a goal	1.227	$<$	1.229
Union-wide output growth as common goal	1.148	$<$	1.150

The effects of discretion II

L^{coop} under Nash (union-wide MP)

Objectives	Cooperation		No cooperation
Output growth as common goal	2.150	$>$	2.142

$L^{cb+mpc+mpp}$ under Nash (regional MPs)

Objectives	Cooperation		No cooperation
Benchmark	2.378	$>$	2.366
Regional output growth as a goal	2.551	$>$	2.523
Union-wide output growth as common goal	2.378	$>$	2.358

- These results are surprising and interesting, and can be due only to **discretion**.
- They are not quantitatively important, however, and should be checked.

Other comments I

- **Implementation**:
  - the periphery may benefit and the core lose – or vice versa – from the institutional arrangement (i.e. from the assigned objectives and timing),
  - so what about considering the Pareto-improving arrangement maximizing euro-area welfare?
  - i.e., the best arrangement, from the point of view of the euro area, satisfying the participation constraints of the core and the periphery?
- **Timing**:
  - given that MPs will probably move less frequently than CB in reality, what about considering them as the leaders?
  - what if the players also choose the timing?
- **Role of MPs**: what about considering also a flexible exchange-rate regime, so as to assess how much national MPs aim at making up for the absence of national CBs?

Other comments II

- **Union-wide loss**: what about considering the sum of the national losses, instead of a loss involving aggregate variables?
- **Presentation**: what about expressing losses in terms of inflation equivalents?
- **Delegation**: why not try to match the commitment cooperative equilibrium, instead of the discretion cooperative equilibrium?
- **Resolution method**: shouldn't the solution procedure take expectations as given prior to optimization?

Conclusion

- **Nice paper**, with some surprising and interesting results (which need to be better explained).
- **Original contribution** in terms of
  - games with three players,
  - Stackelberg games,
  - optimal discretionary policies.
- **Framework** that can be used to address additional issues (e.g. endogenous timing).