

LIQUIDITY SAVING MECHANISMS and BANK BEHAVIOUR

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LIQUIDITY SAVING MECHANISMS

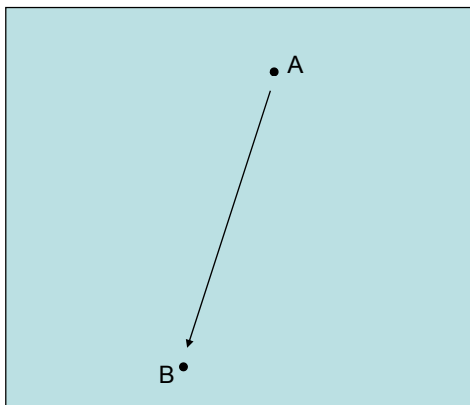
Aim: reduce liquidity needs of RTGS systems

How: *central* queues where payments can be netted
(→ hybrid systems)

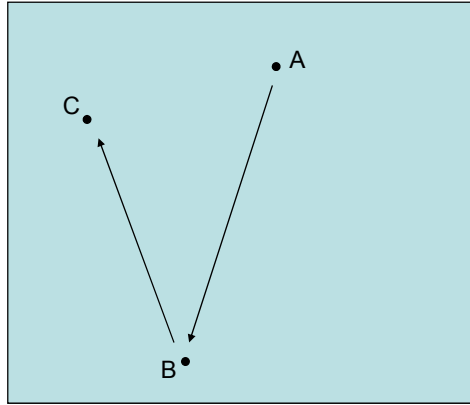
LSM - example



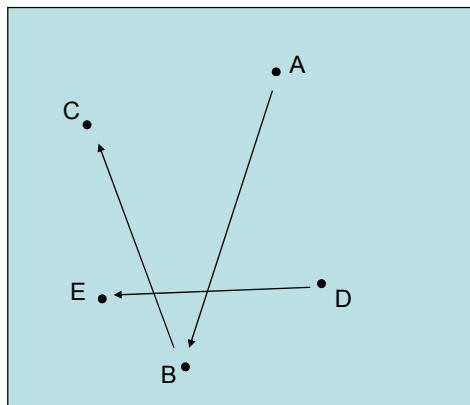
LSM - example



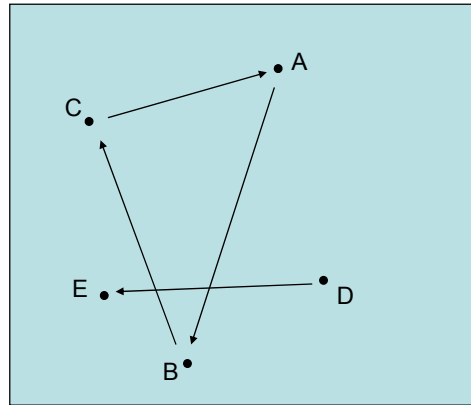
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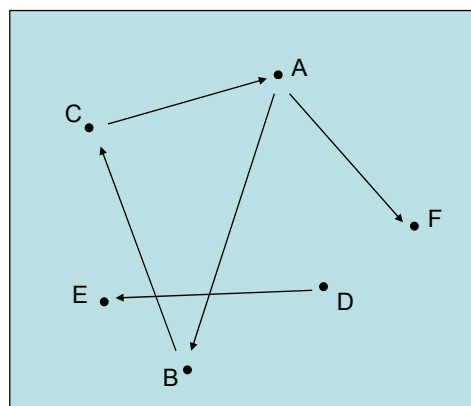
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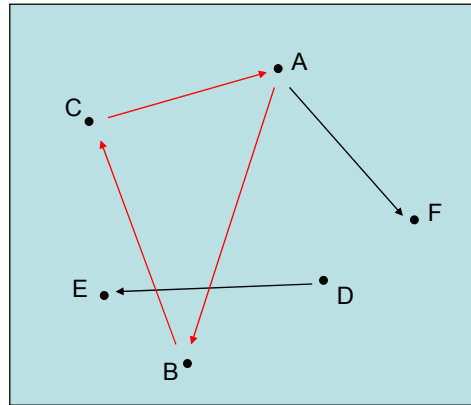
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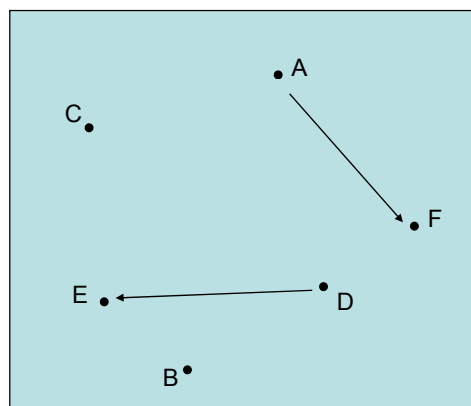
LSM - example



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ISSUES

find cycles / choose which ones to
settle / how often

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LSM

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LSM

how are payments submitted to LSM?

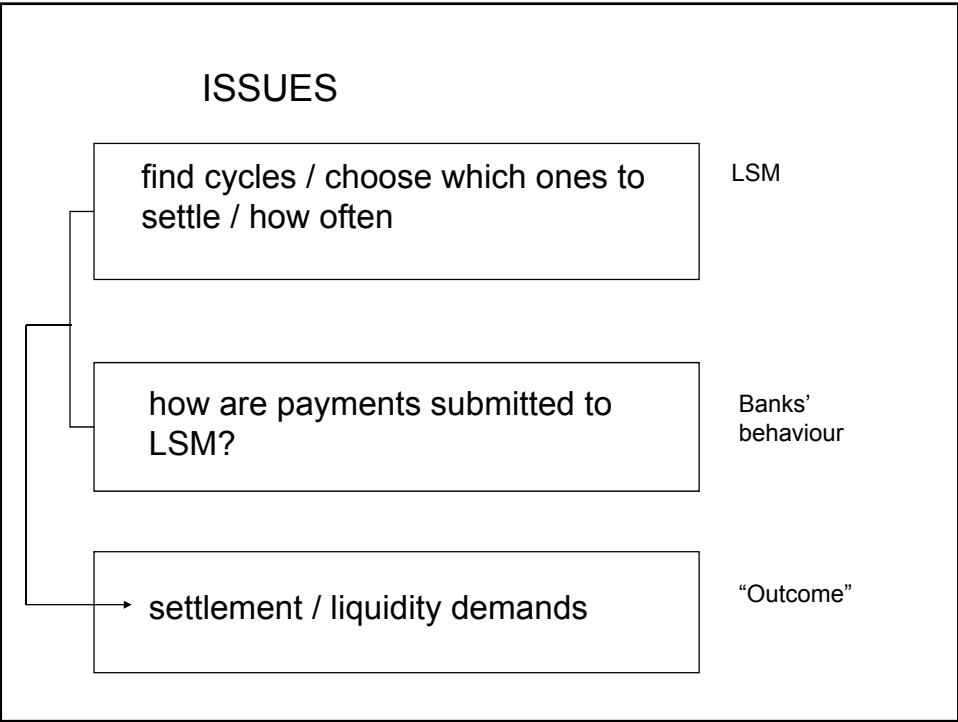
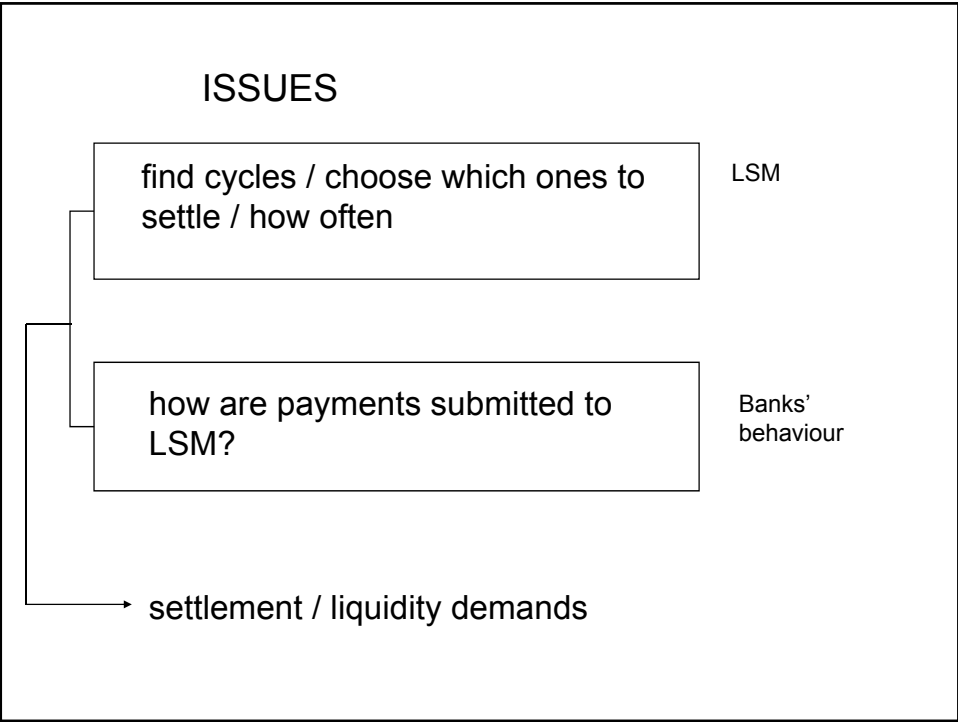
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LSM

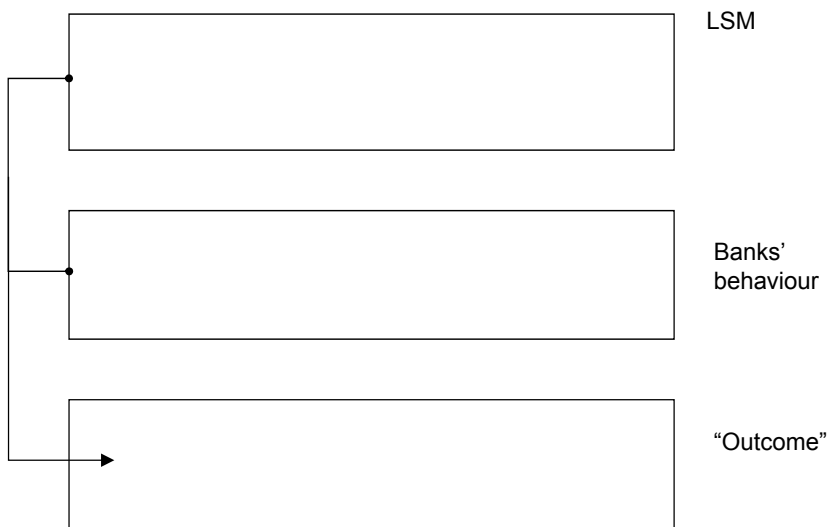
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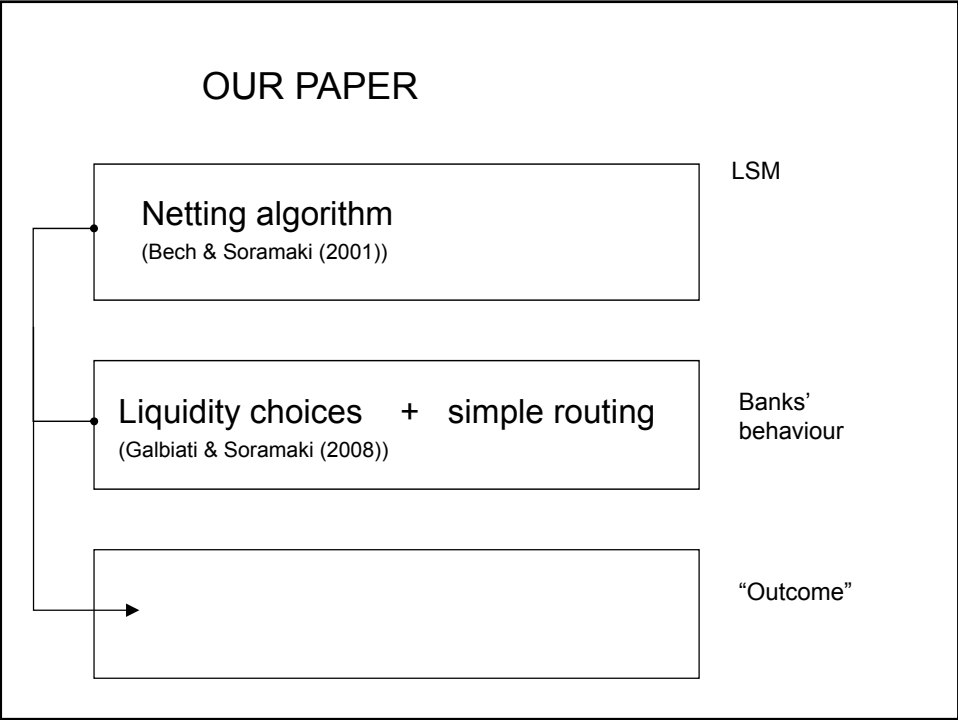
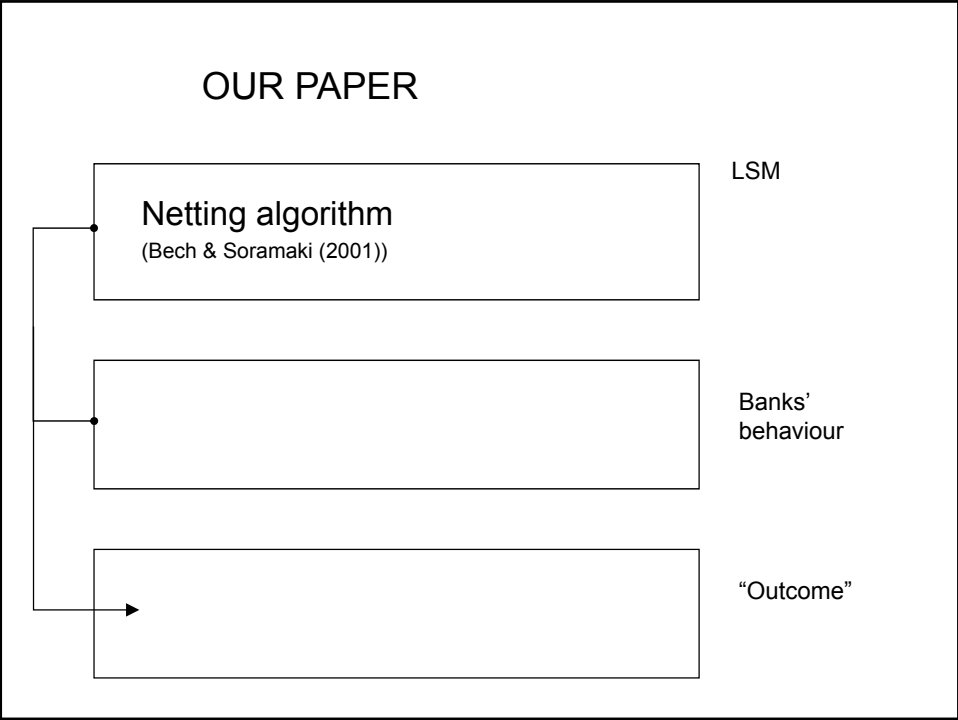
Banks' behaviour

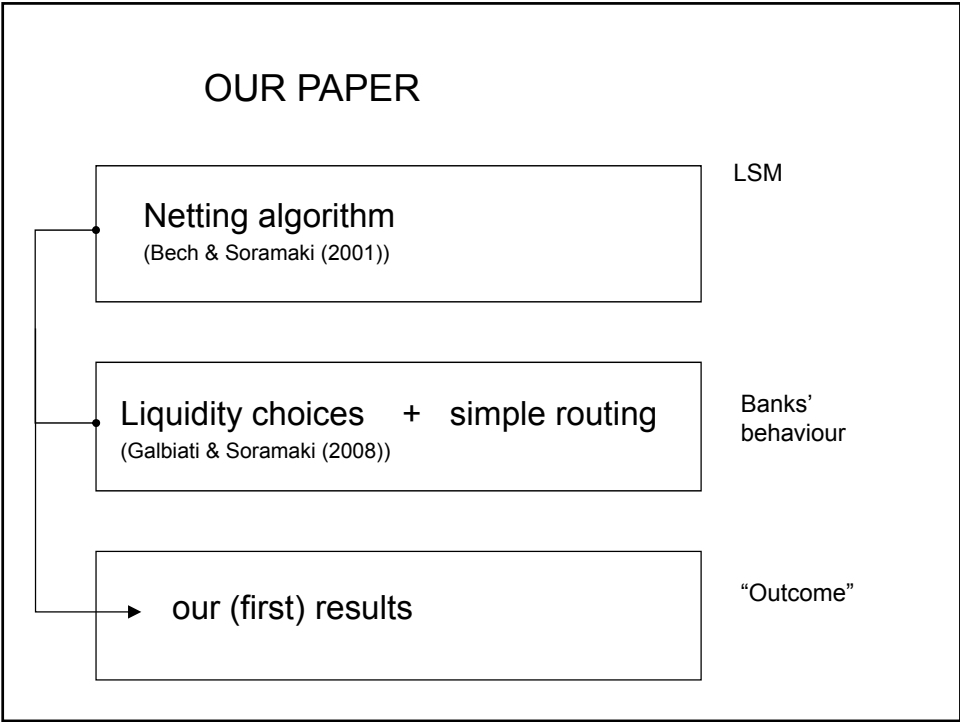


OUR PAPER

OUR PAPER







OTHER PAPERS

Shafransky et al. (2006) – EJ Op. Res. Bech & Soramäki (2001) – BoF disc. paper Guntzer et al. (1998) - EJ Op. Res.	<i>LSM / Algorithms</i>
Martin and McAndrews (2008) - JME Martin and McAndrews (2008) - FRBNY Ec. Pol. Review Atalay, Martin, McAndrews (2008) – FRNY staff report Johnson, McAndrews, Soramäki (2004) - FRBNY Ec. Pol. Review Willison (2004) – BoE wp	<i>Banks behaviour</i>

LIQUIDITY and ROUTING CHOICES

A B C D E

RTGS

LSM

LIQUIDITY and ROUTING CHOICES

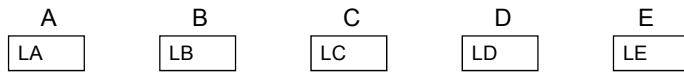
A B C D E

LA LB LC LD LE

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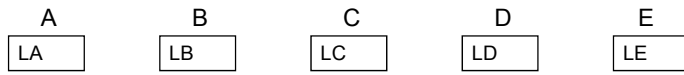
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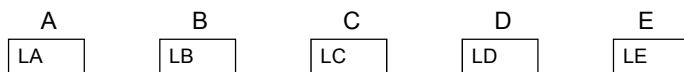
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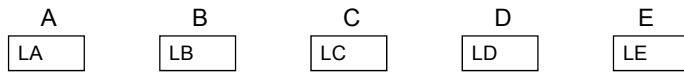


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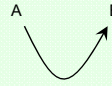


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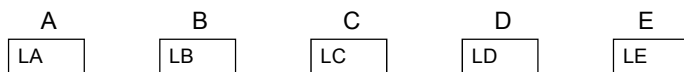


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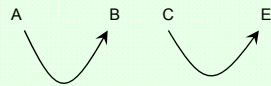


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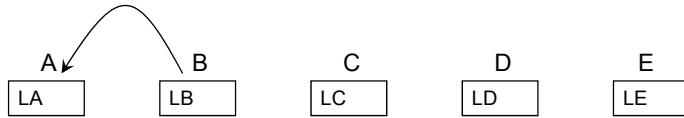


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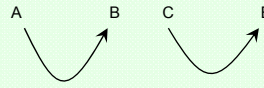


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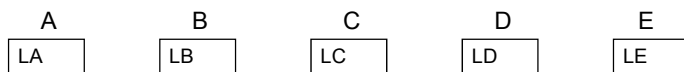


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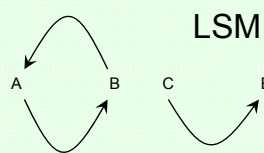


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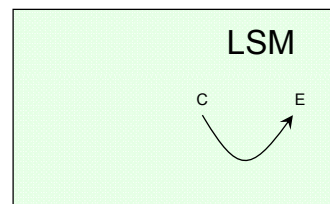
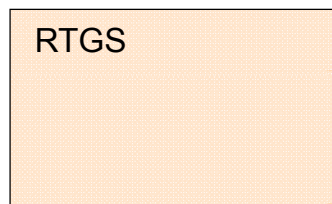
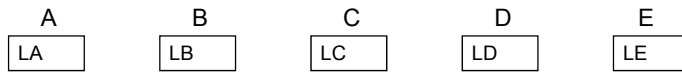


RTGS

LSM



LIQUIDITY and ROUTING CHOICES



LIQUIDITY and ROUTING CHOICES

summing up

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Two choices

- a) initial liquidity **L** (trading off liquidity vs 'delay costs')
- b) routing rule (threshold) **T** (reserving liquidity for urgent payments, thus easing liquidity/delay costs tradeoff)

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Optimal choice of **L** and **T** depends on:

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Equilibrium: mutually optimal choices of **L** and **T**

RESULTS - 'mechanics'

Efficiency of LSM

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Efficiency of LSM

HOW:

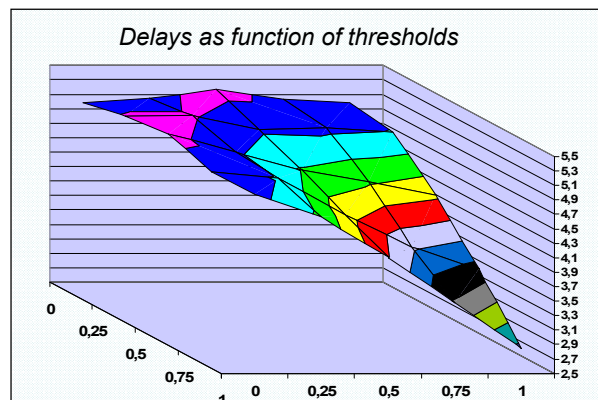
- Set $L=0$ (pure LSM),
- Look at delays as function of thresholds ('my' and average 'other')

RESULTS - 'mechanics'

Efficiency of LSM

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System size and LSM efficiency

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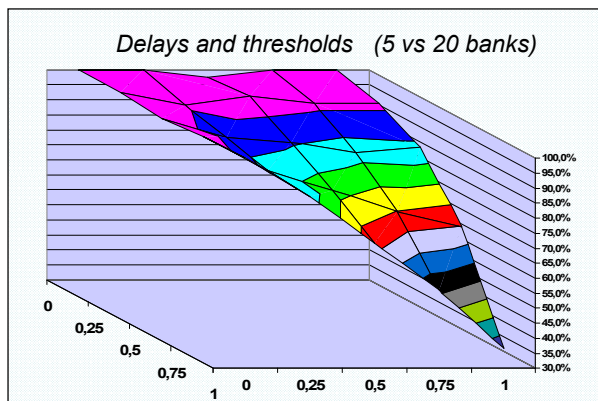
- a) Set $L=0$ (pure LSM),
- b) Look at delays as function of thresholds,
- c) Compare 5-bank system vs 20-bank system

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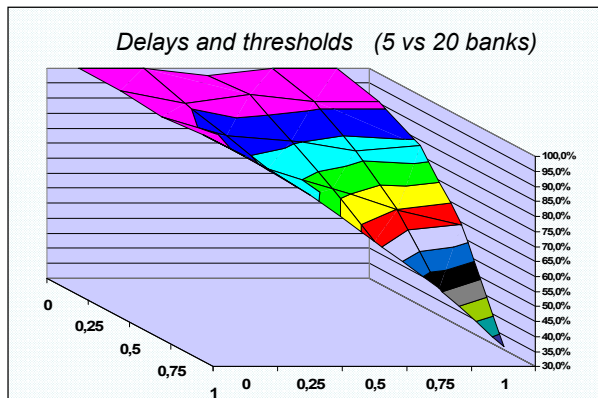


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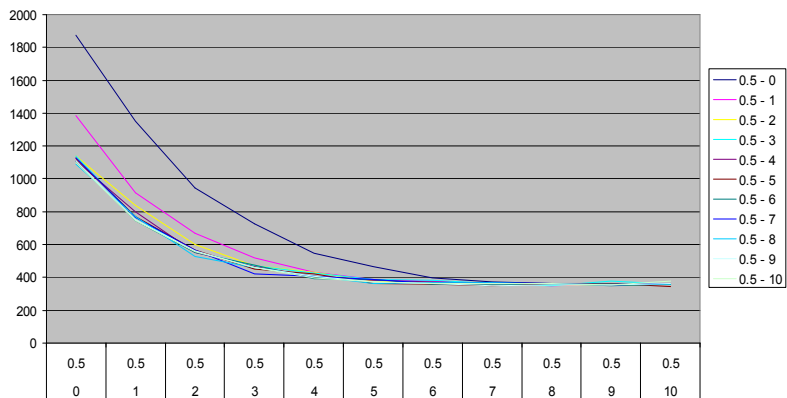


Result:

LSM is more efficient the smaller the system

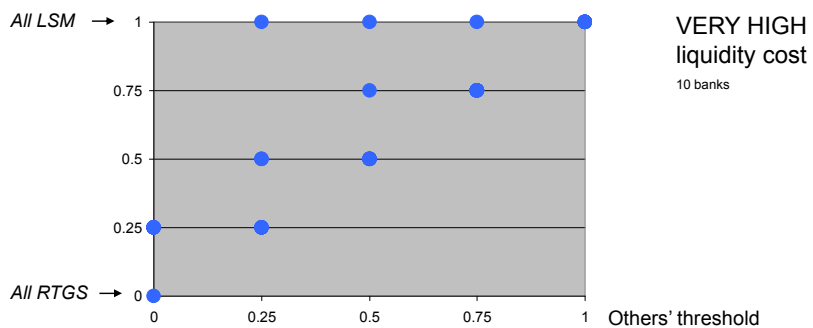
RESULTS - 'mechanics'

Average payment delay - function of own and others' (average) T and L



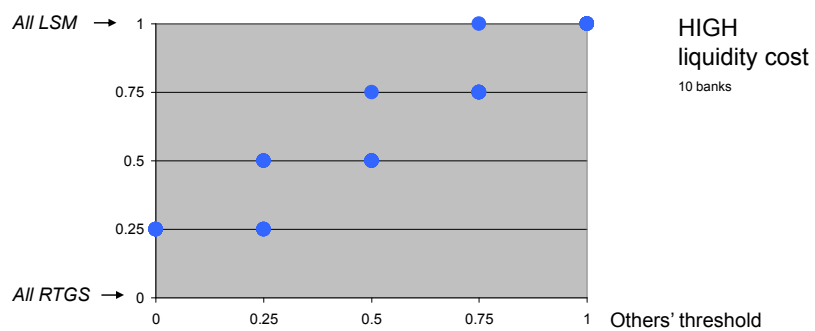
RESULTS - 'optimal choices'

Optimal usage of LSM (choice of T)



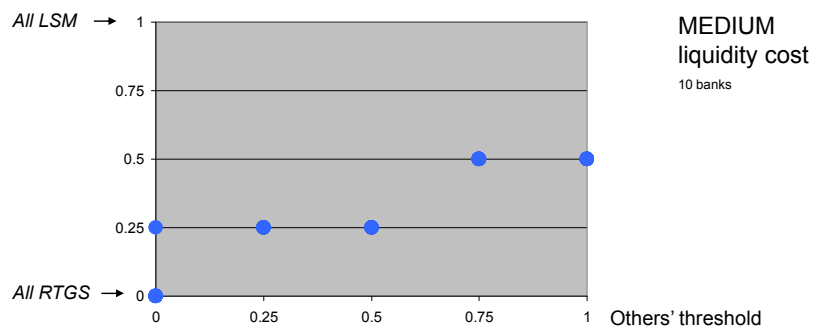
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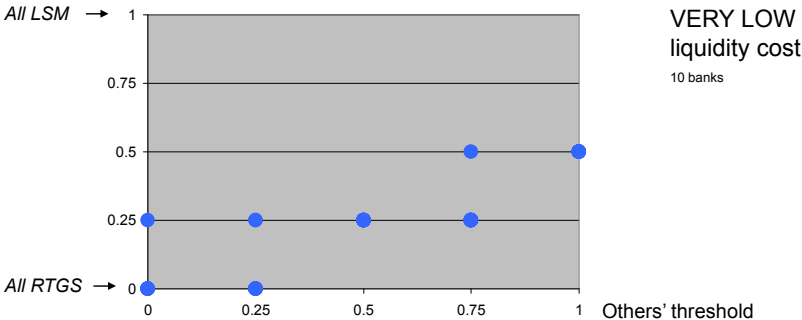
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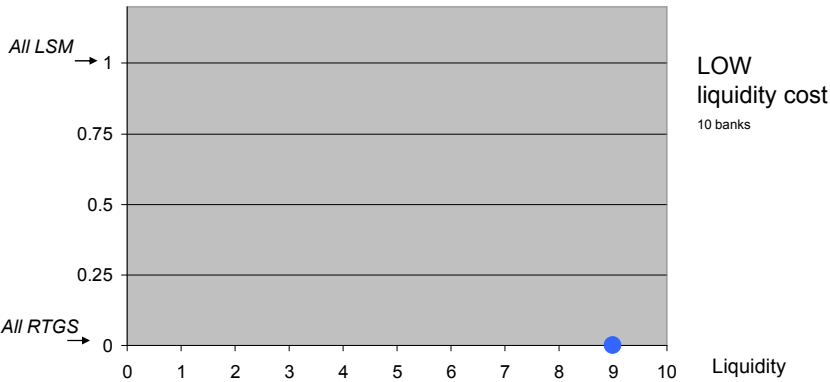


RESULTS - 'equilibrium'

Equilibrium: mutually optimal choices of L and T, given liquidity costs

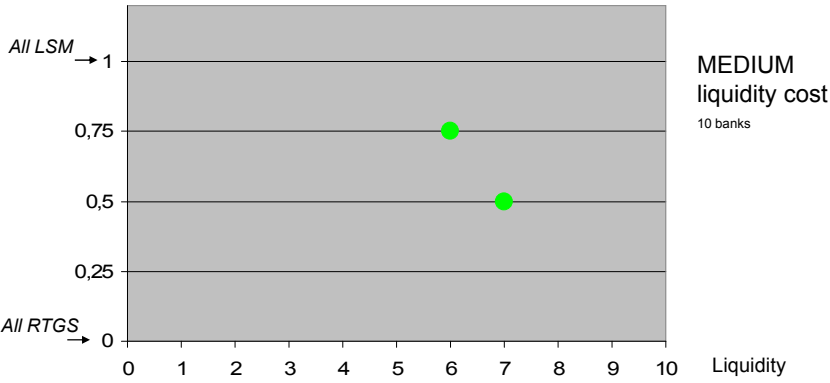
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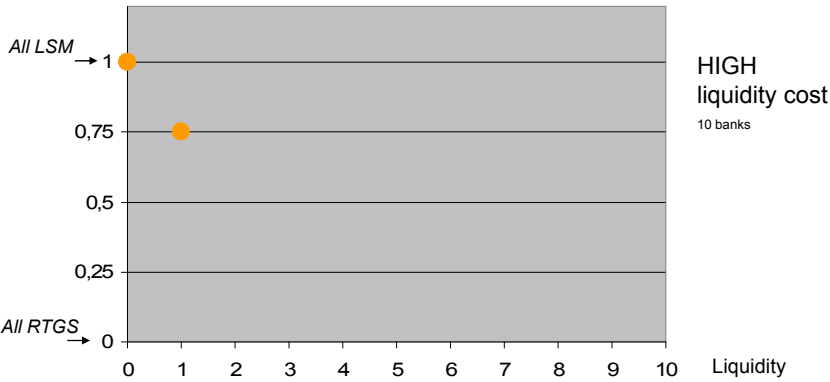
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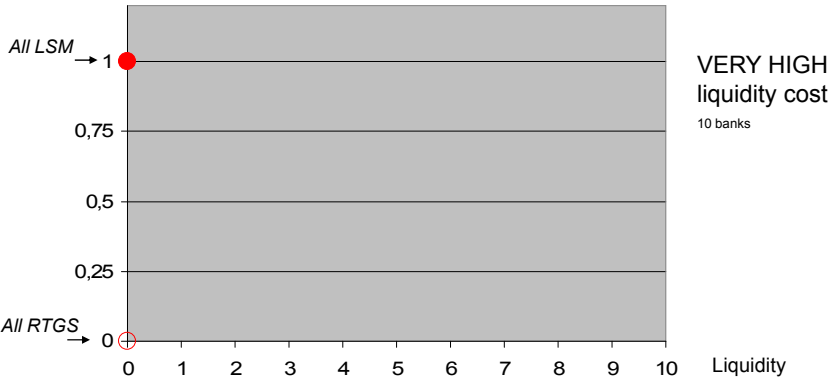
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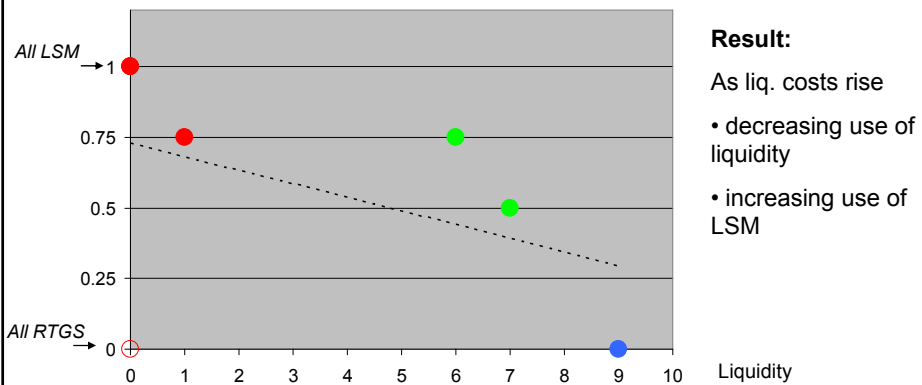
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FUTURE WORK

Suppose liquidity costs increase:

what effects on system performance (plain RTGS vs hybrid system)

Suppose banks forced to hold more liquidity:

what effect on usage of LSM and system performance?
(conjecture: LSM usage ↓, delays possibly ↑)