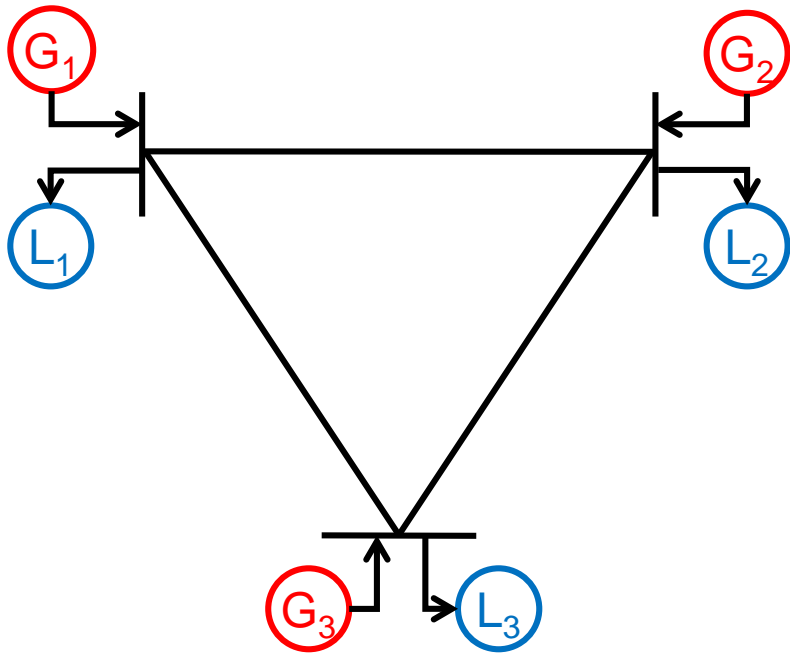


# The Role of a Market Maker in Networked Cournot Competition

Desmond Cai

Joint work with S. Bose, A. Wierman, S. Low

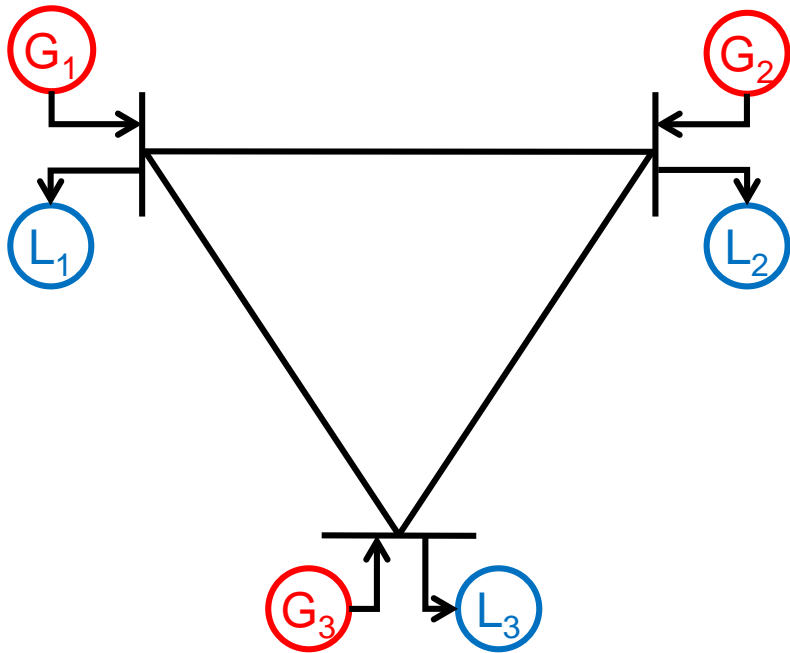
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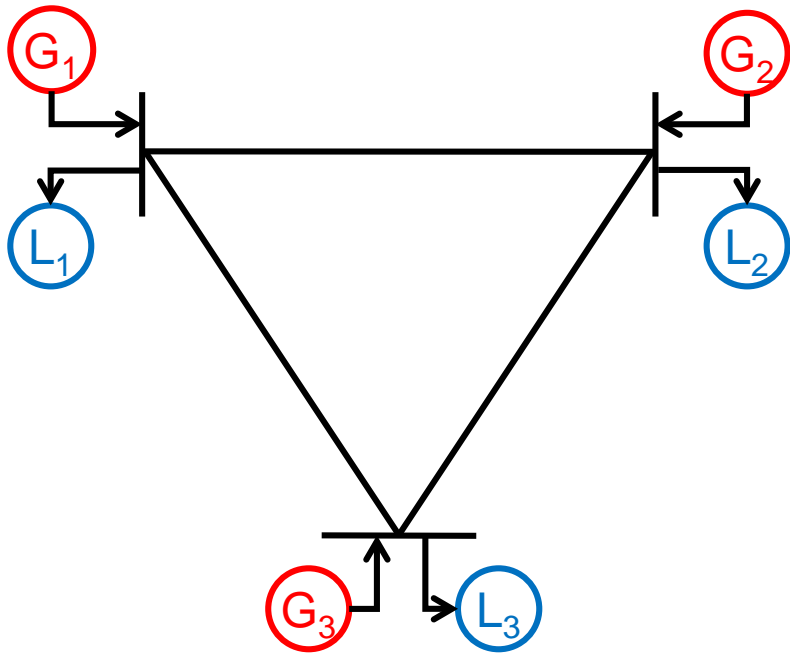
Market operator solves:

$$\max \sum_i (u(d_i) - c(s_i))$$

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s. t. power flow constraints  
capacity constraints  
line constraints

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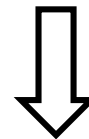
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Allocations:  $d_i^*, s_i^*$   
Locational marginal prices:  $\lambda_i^*$

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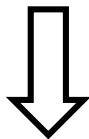
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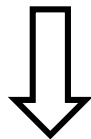
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Inefficiency

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- 2012 J.P. Morgan (125 million)
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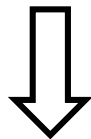
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Options:

Modify allocation function

Modify pricing mechanism (e.g. VCG)

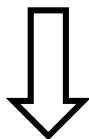
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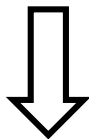
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  - Consumer surplus
  - Residual social welfare

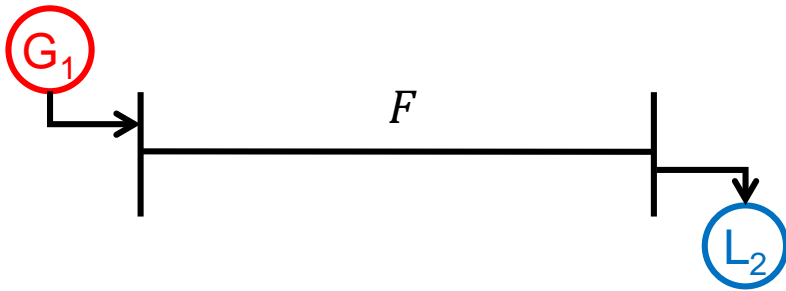


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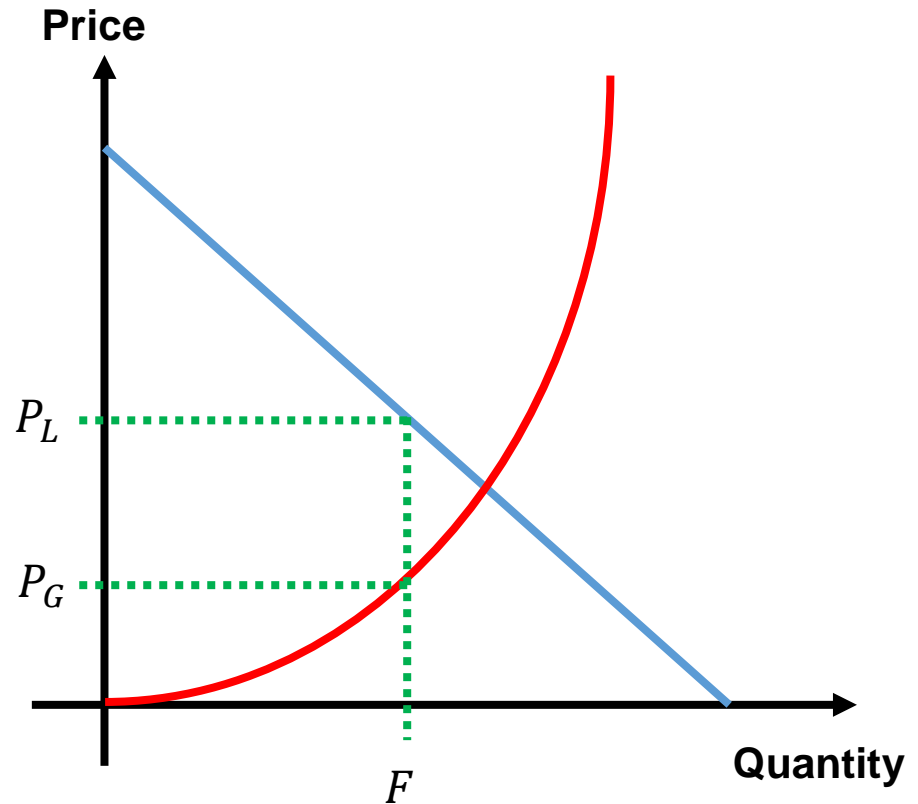
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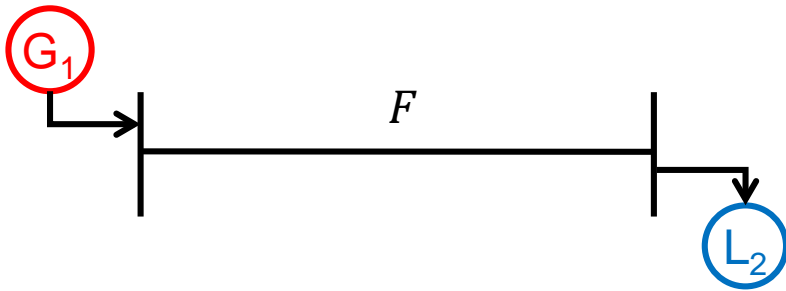


Load pays:  $P_L F$   
Generator receives:  $P_G F$

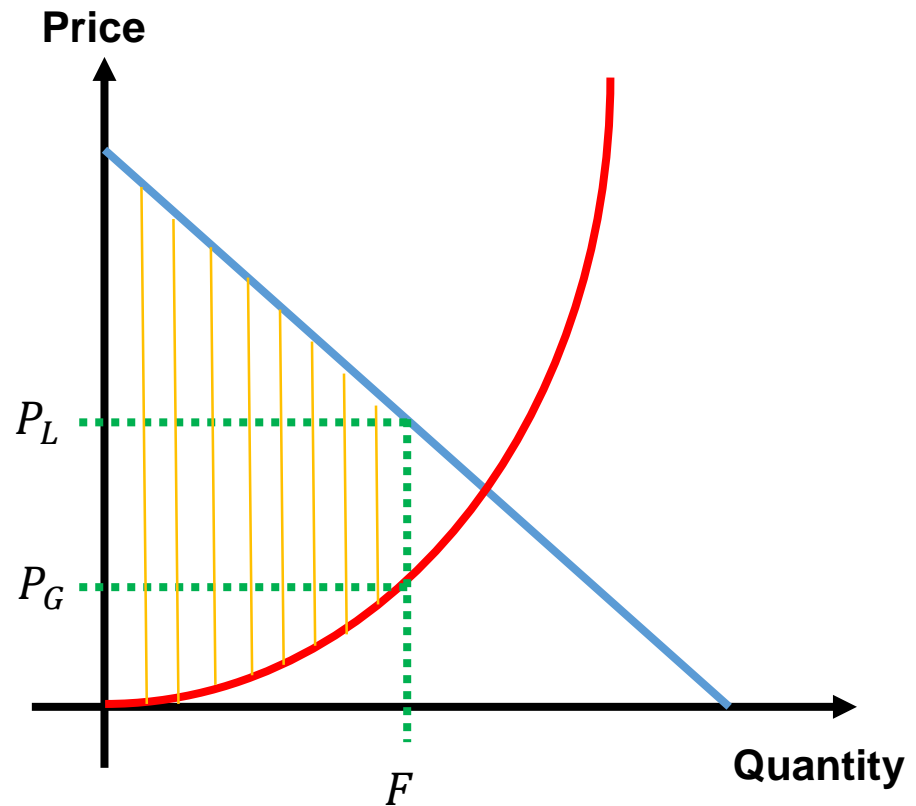


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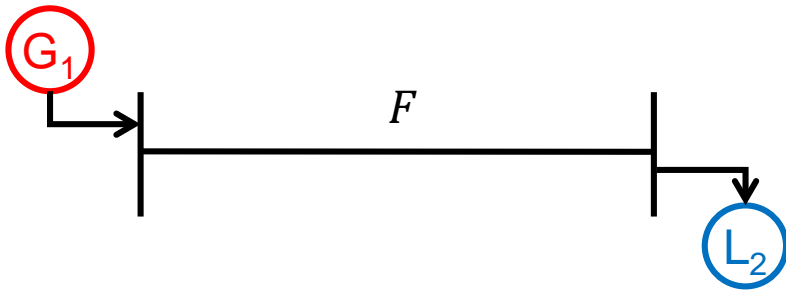


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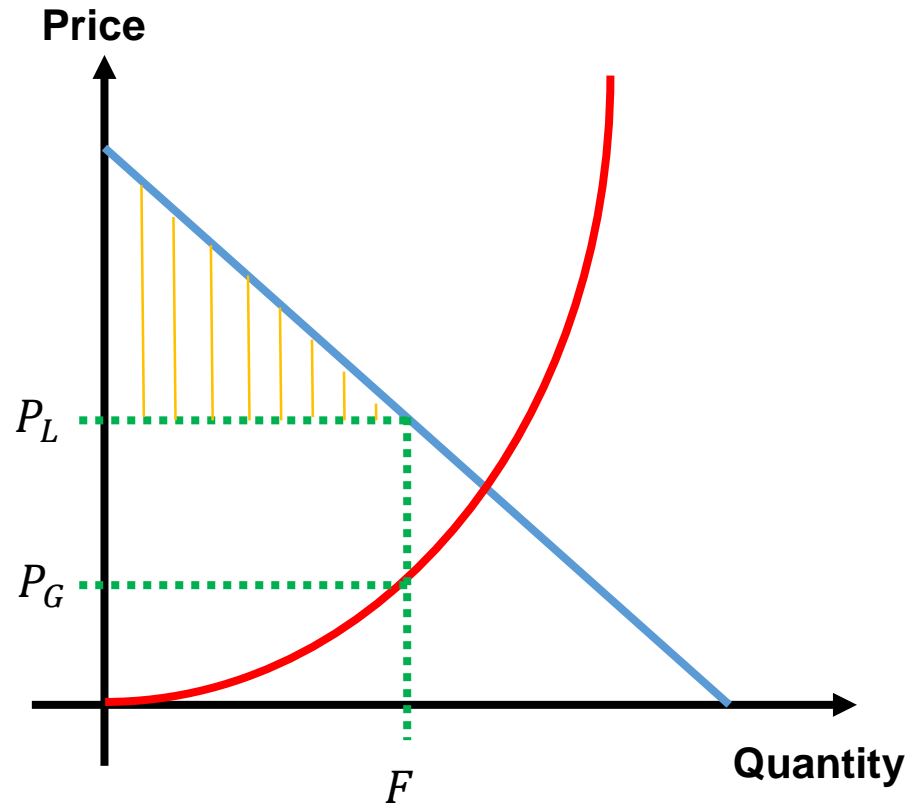


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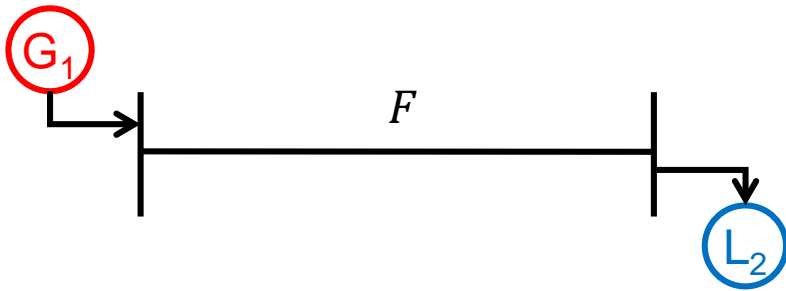


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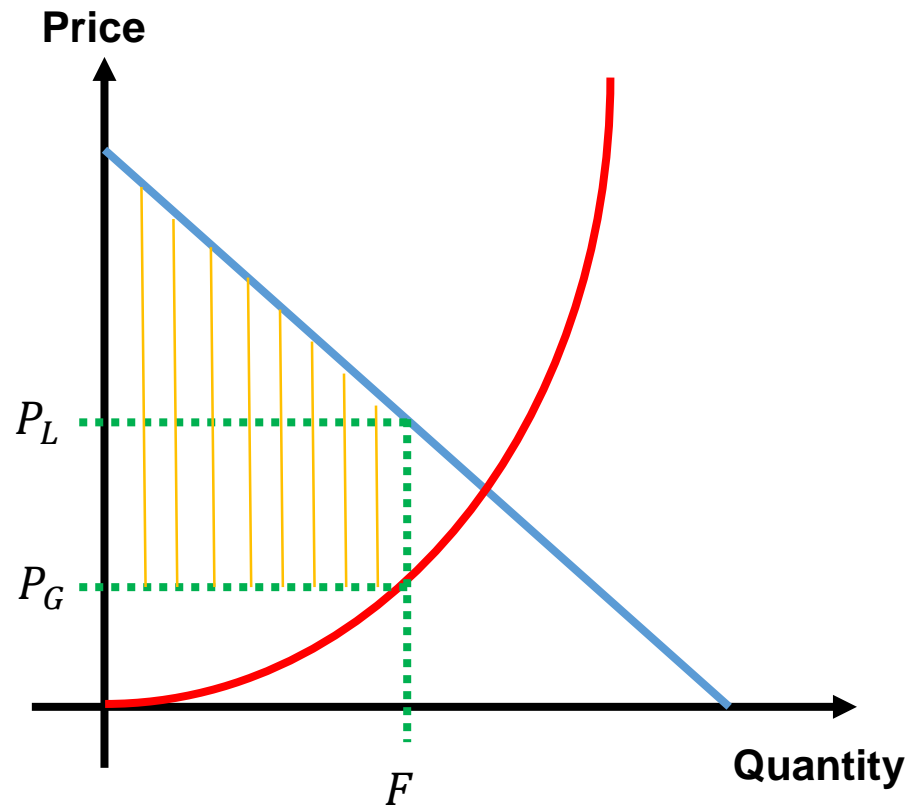


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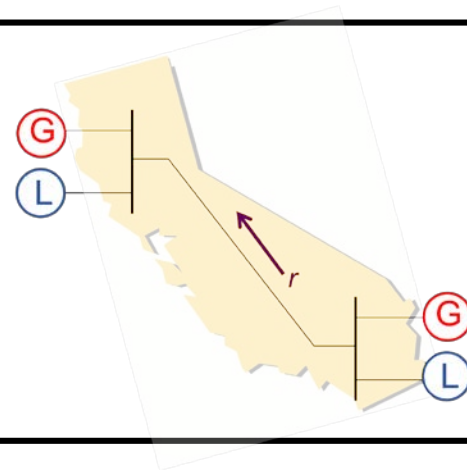
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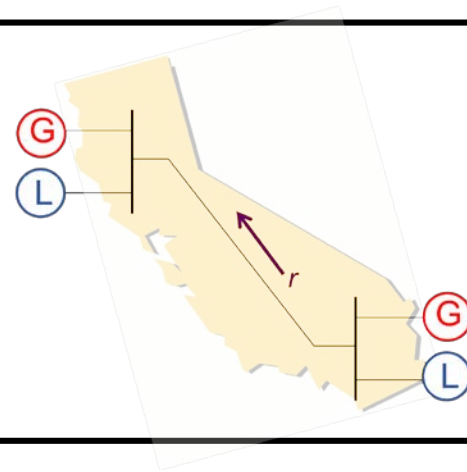




# Findings

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**See poster for details!**