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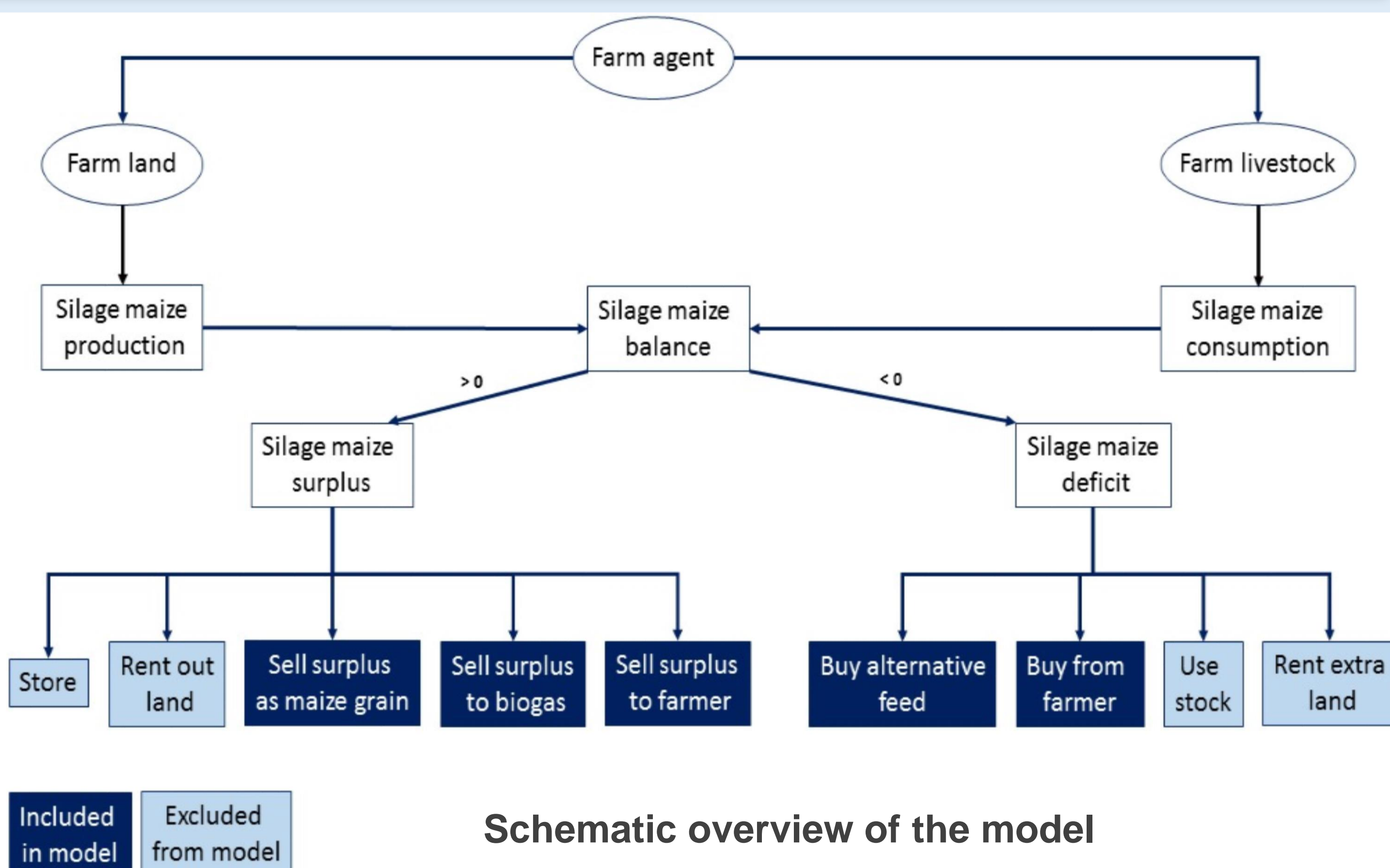
INTRODUCTION

TRANSACTION CHARACTERISTICS

- High transportation costs
- Large variability in prices, quality and yield
- Relational governance between farmers
- Recently: biogas plants with high demand for silage maize

RESEARCH OBJECTIVE

- Assess the influence of biogas plants on silage maize trade:
 - Importance of transaction costs
 - Influence of biogas plants on WTP for silage maize



CONCEPTUAL MODEL

SIMULATION OF BILATERAL TRADE IN GAMS

Objective function

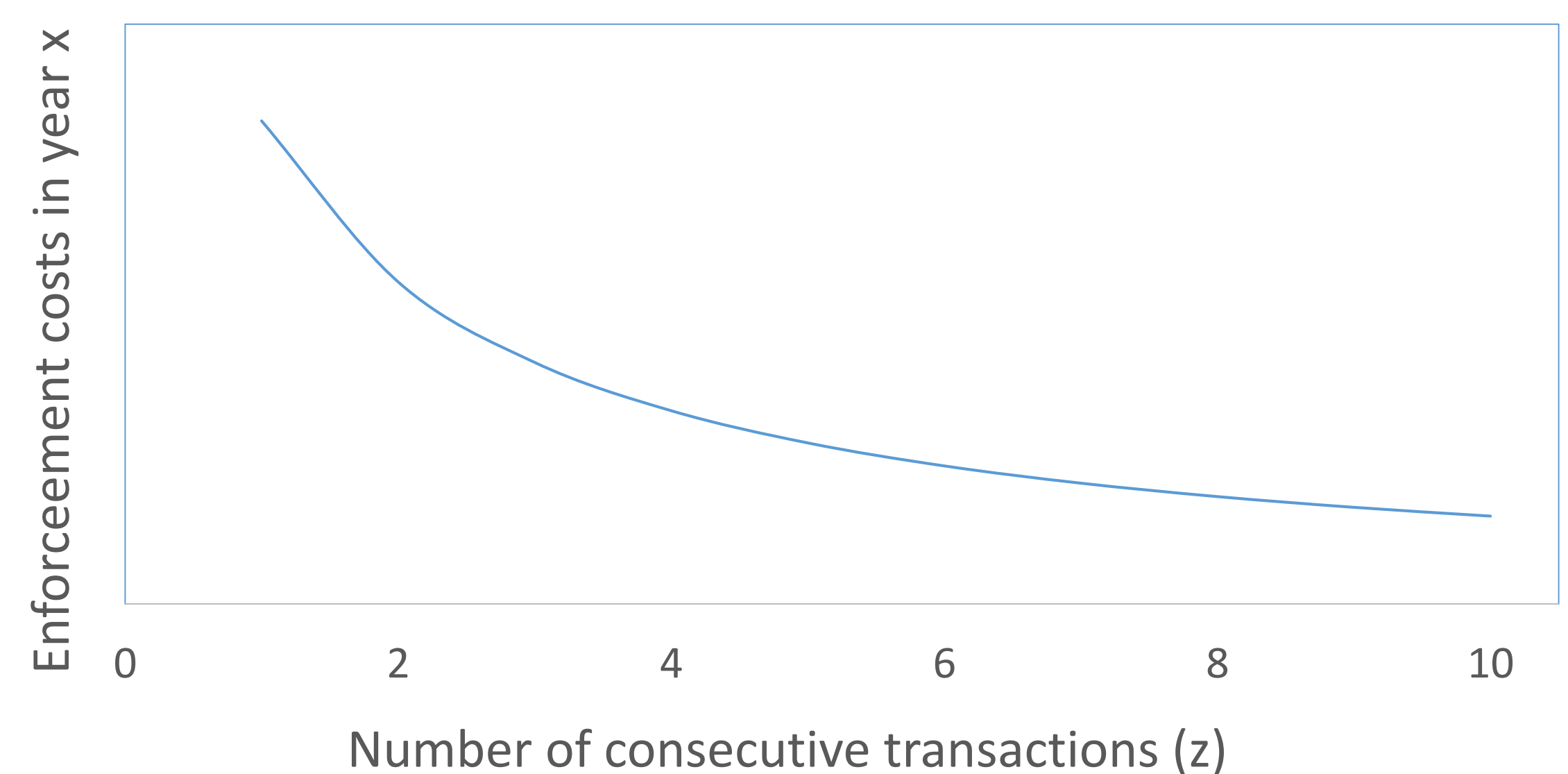
- Revenue maximization
- Roughage cost minimization

Heterogenous transaction costs (TC):

- Search costs (SC)
- Negotiation costs (NC)
- Enforcement costs (EC)

Dynamic TC upon repeated transactions

- $SC = 0, NC = 0$
- $EC_{ij(x+1)} = EC_{ij(x)} * (1 - (0.5 + (1 - 0.5) * (1 - \frac{1}{0.5z+1-0.5})))$



Graphical representation of declining enforcement costs

MODEL RESULTS

Impact of increasing transaction costs on informal silage maize trade

	Initial total transaction costs (€)	Number of selling farms	Number of buying farms	Total number of transactions	Average volume silage maize transacted per transaction (ton)	Average distance of transactions (km)	Average WTP for silage maize by farmers with a negative maize balance (€/ton)
Without biogas plant	300	6	5	7	28	2.5	161
	1800	3	3	3	55	1.5	214
	3000	1	1	1	66	1.5	232
With large biogas plant	300	39	2	39	125	4.6	250
	1800	37	2	37	131	4.7	250
	3000	34	2	34	140	4.7	250

PRELIMINARY CONCLUSION

INFLUENCE TRANSACTION COSTS

- Number of transactions declines
- Volume transacted increases
- WTP for silage maize increases

INFLUENCE BIOGAS PLANT

- Higher number of transactions
- Transactions over larger distances
- Higher WTP for silage maize