Dynamic Mechanism Design without Transfers

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August 17, 2018

Chapters

1. Design of Committee Search
2. School Choice with Observable Characteristics
3. Mechanism Design for Stopping Problems with Two Actions

Chapter 1

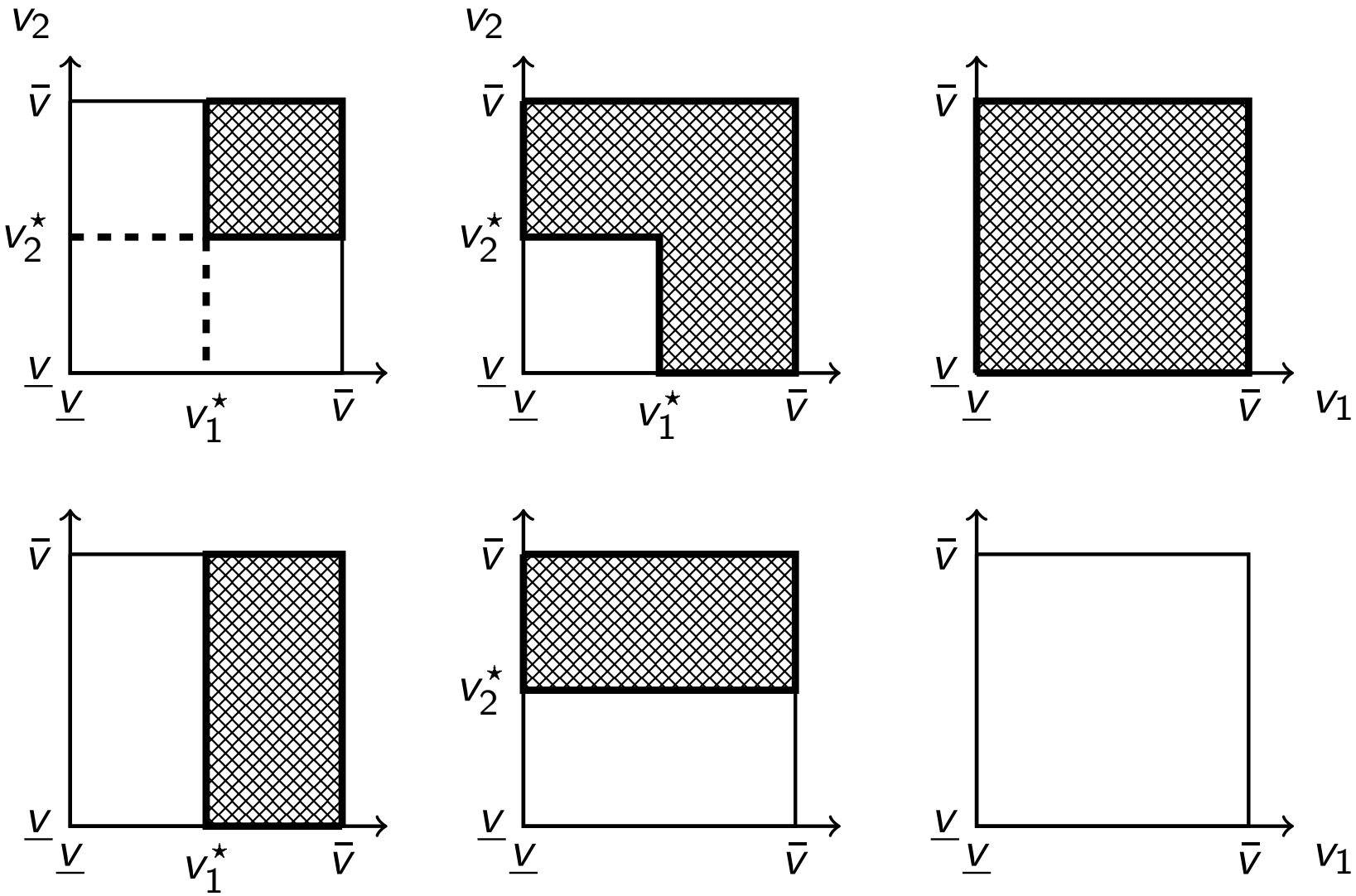
Design of Committee Search

- Committee search problems that have,

1. Sequential decision,
2. Irreversible decision,
3. Private value,
4. Public allocation, and
5. No transfers.

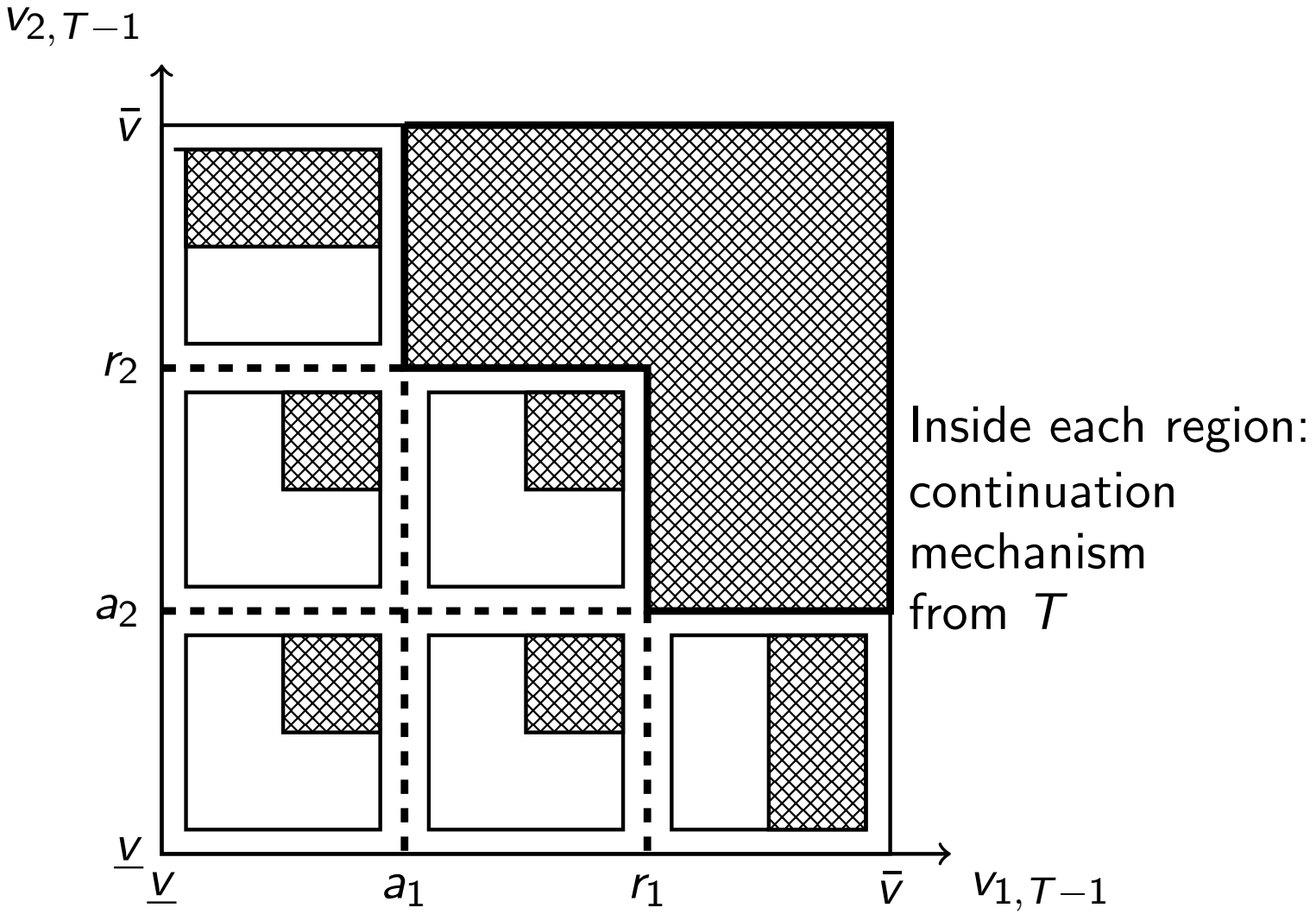
Static Problem

Binary Mechanisms



Two-Period Problem

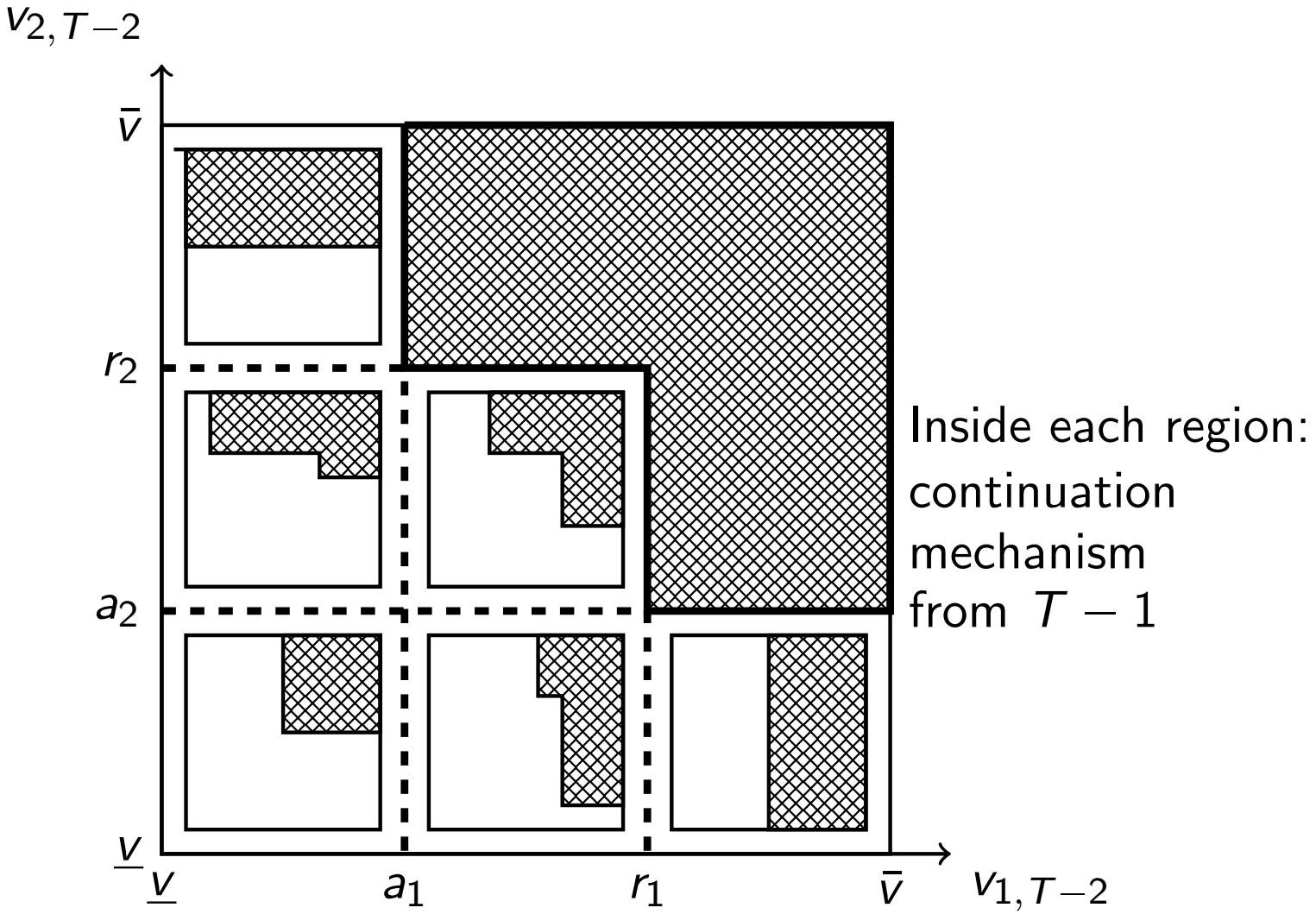
Ternary Mechanisms



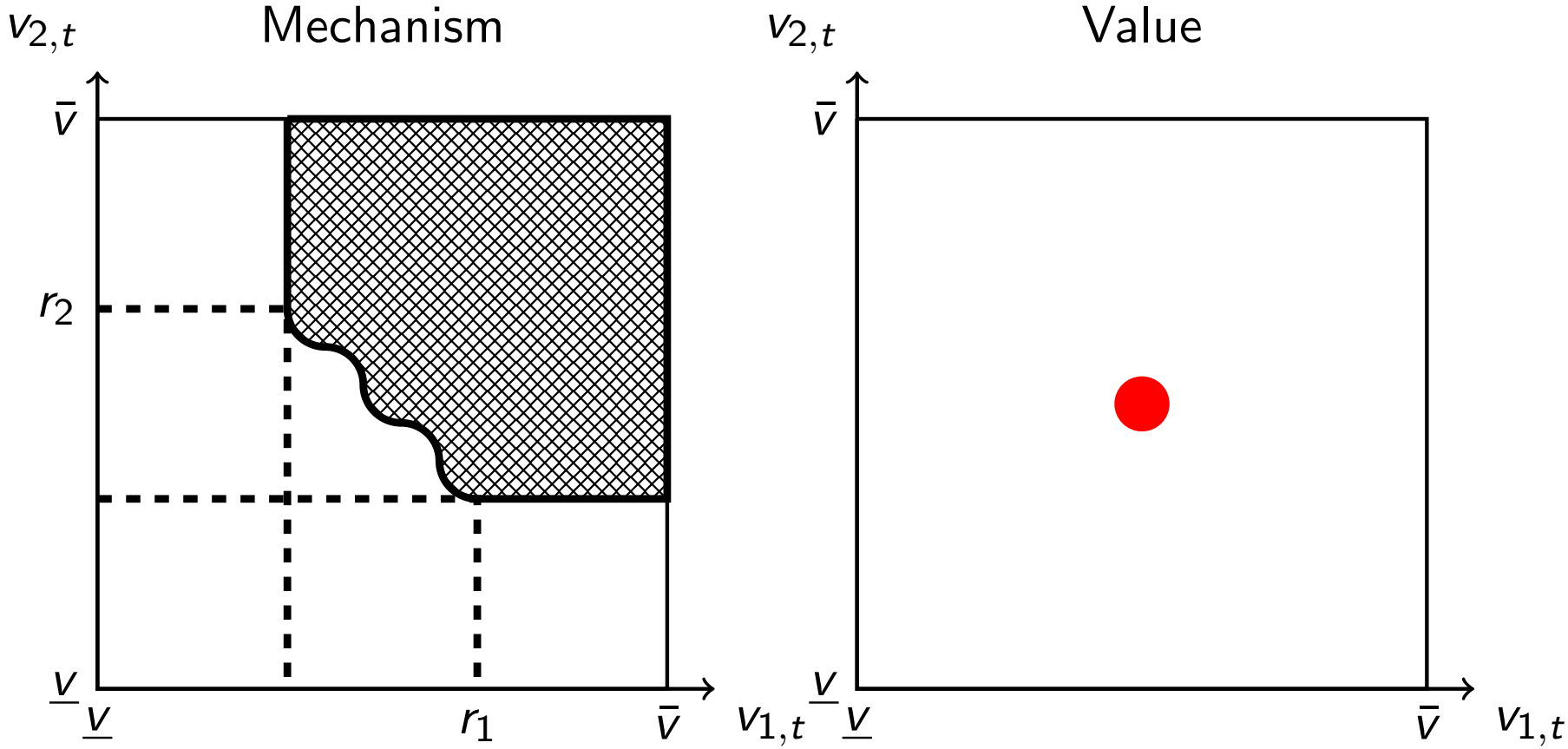
Inside each region: continuation mechanism from T

Three-Period Problem

More Ternary Mechanisms

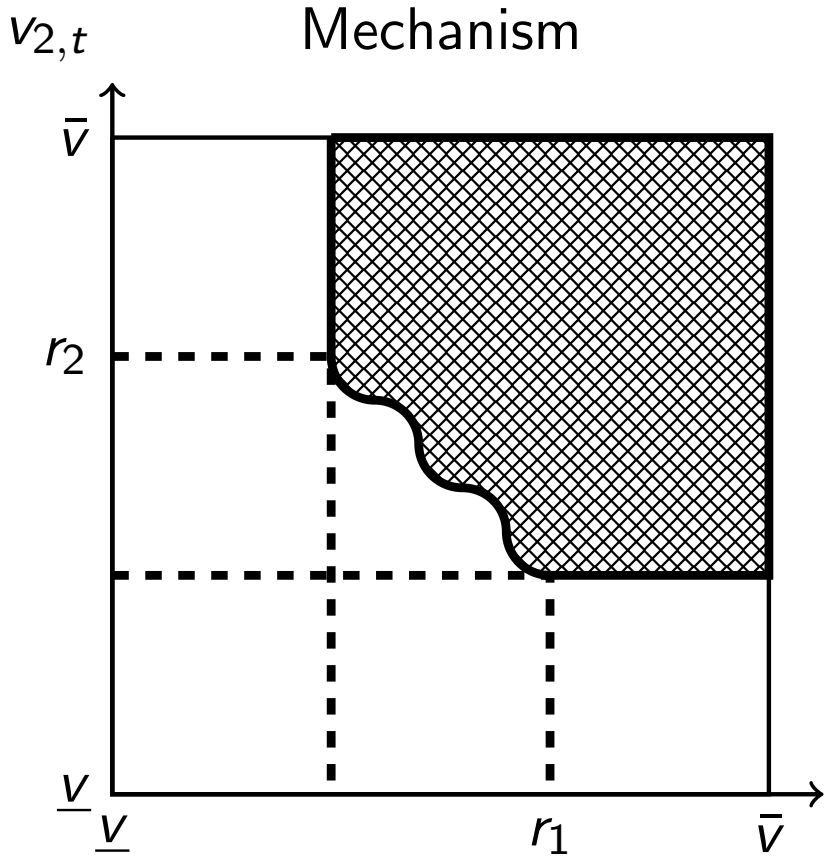


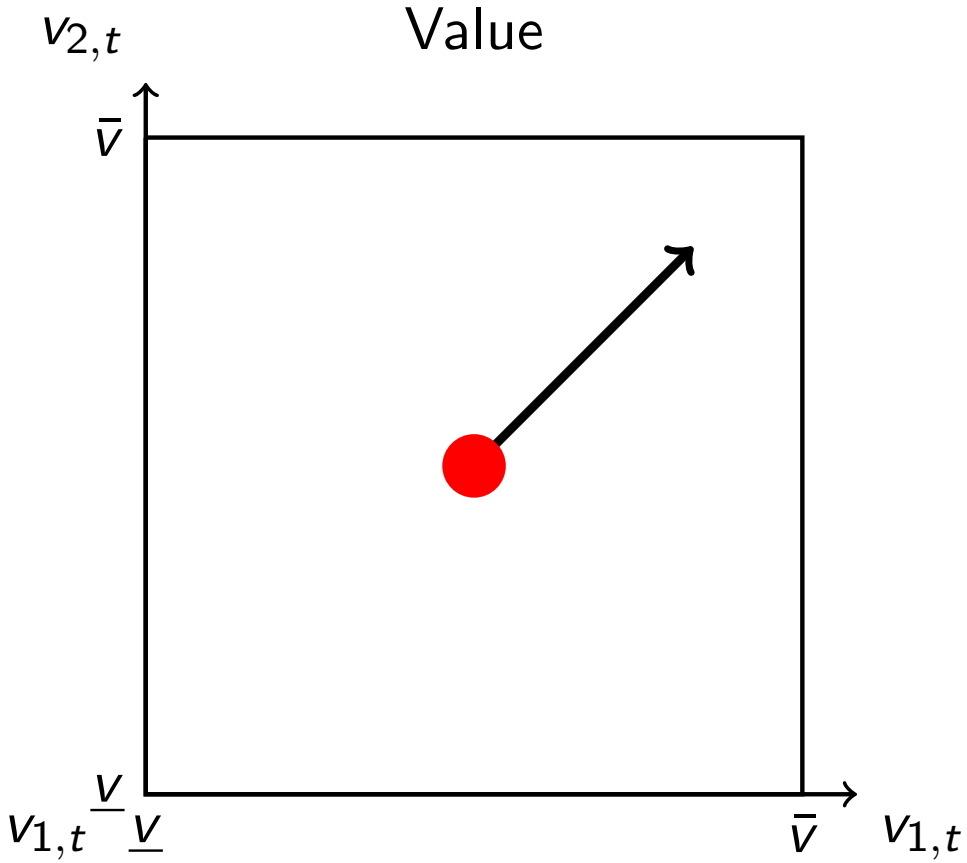
Pareto Optimal Mechanisms



Other Boundary Mechanisms

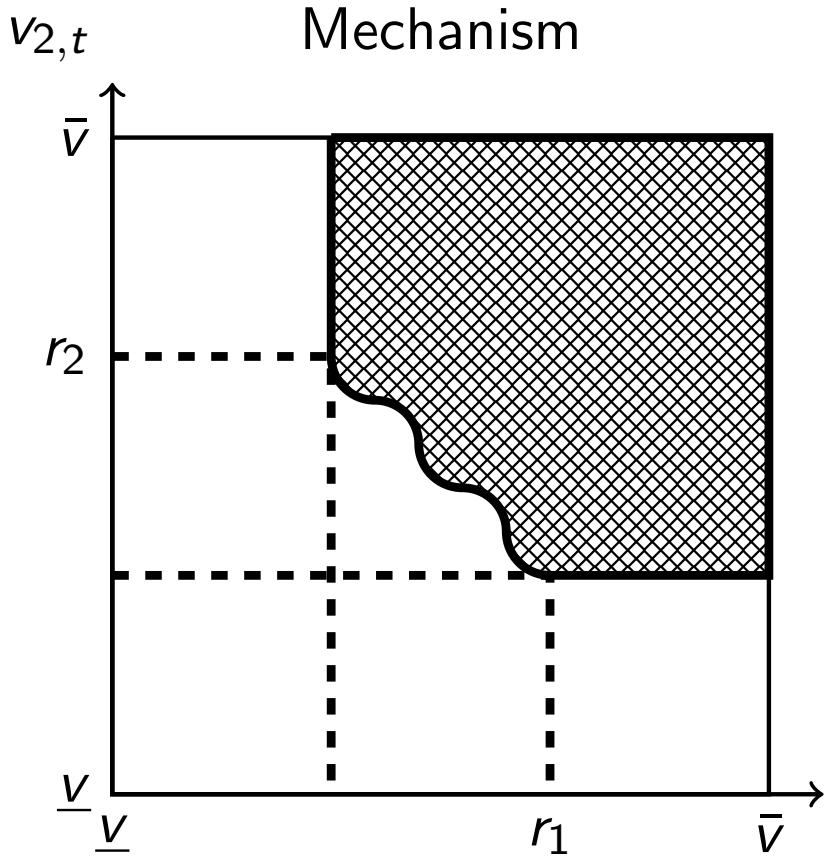
Worse for 1, Better for 2

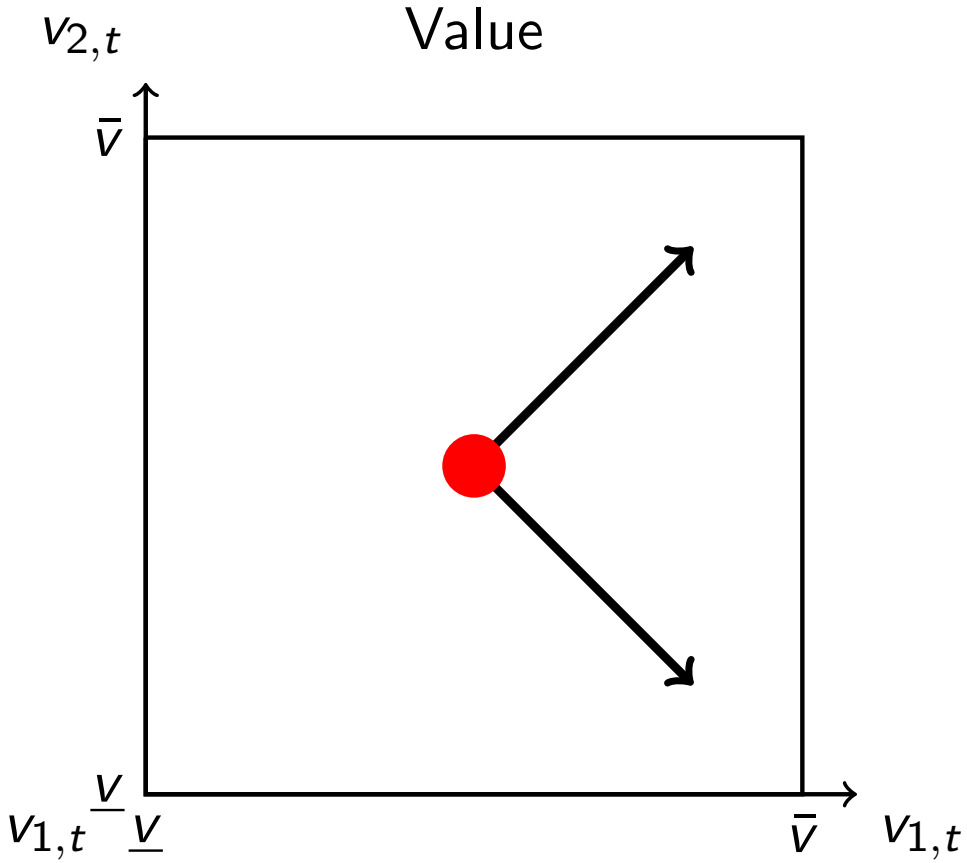




Other Boundary Mechanisms

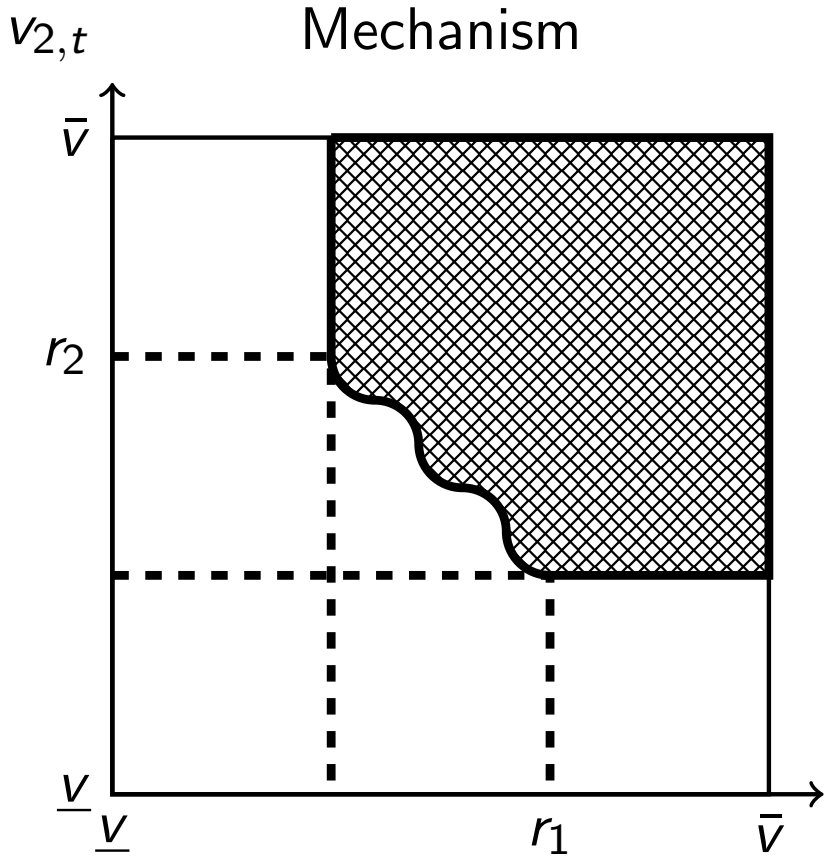
Better for 1, Worse for 2

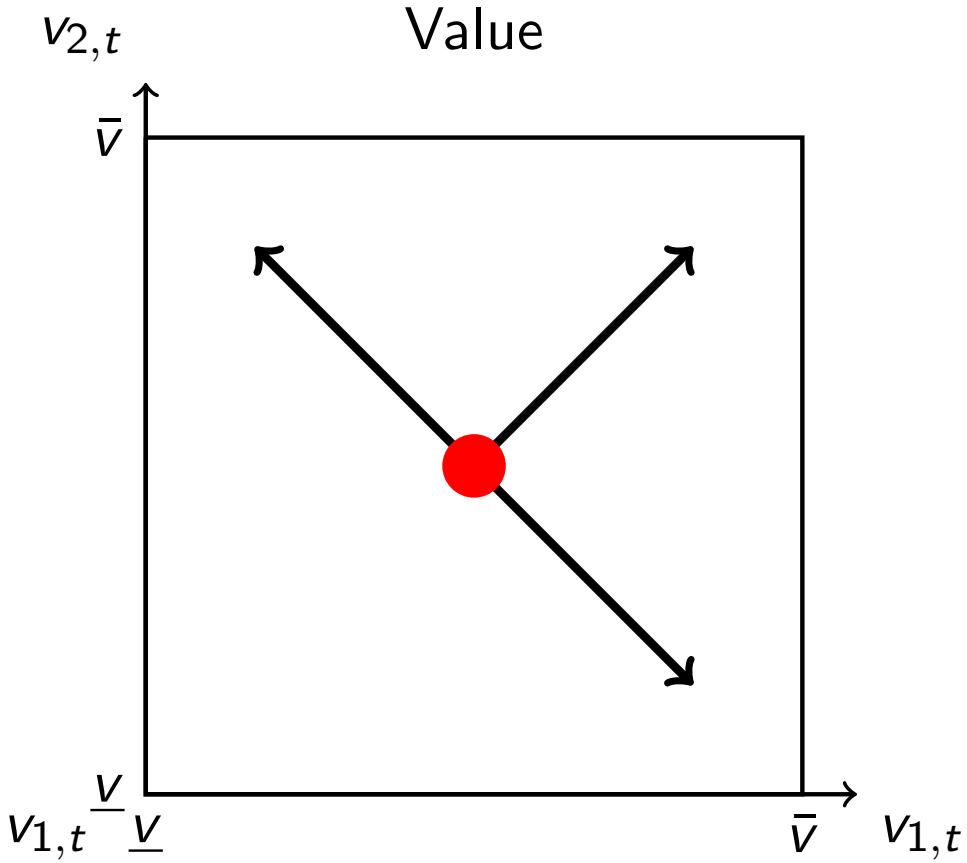




Other Boundary Mechanisms

Worse for Both





Chapter 2: School Choice with Observable Characteristics

- School choice problem where,

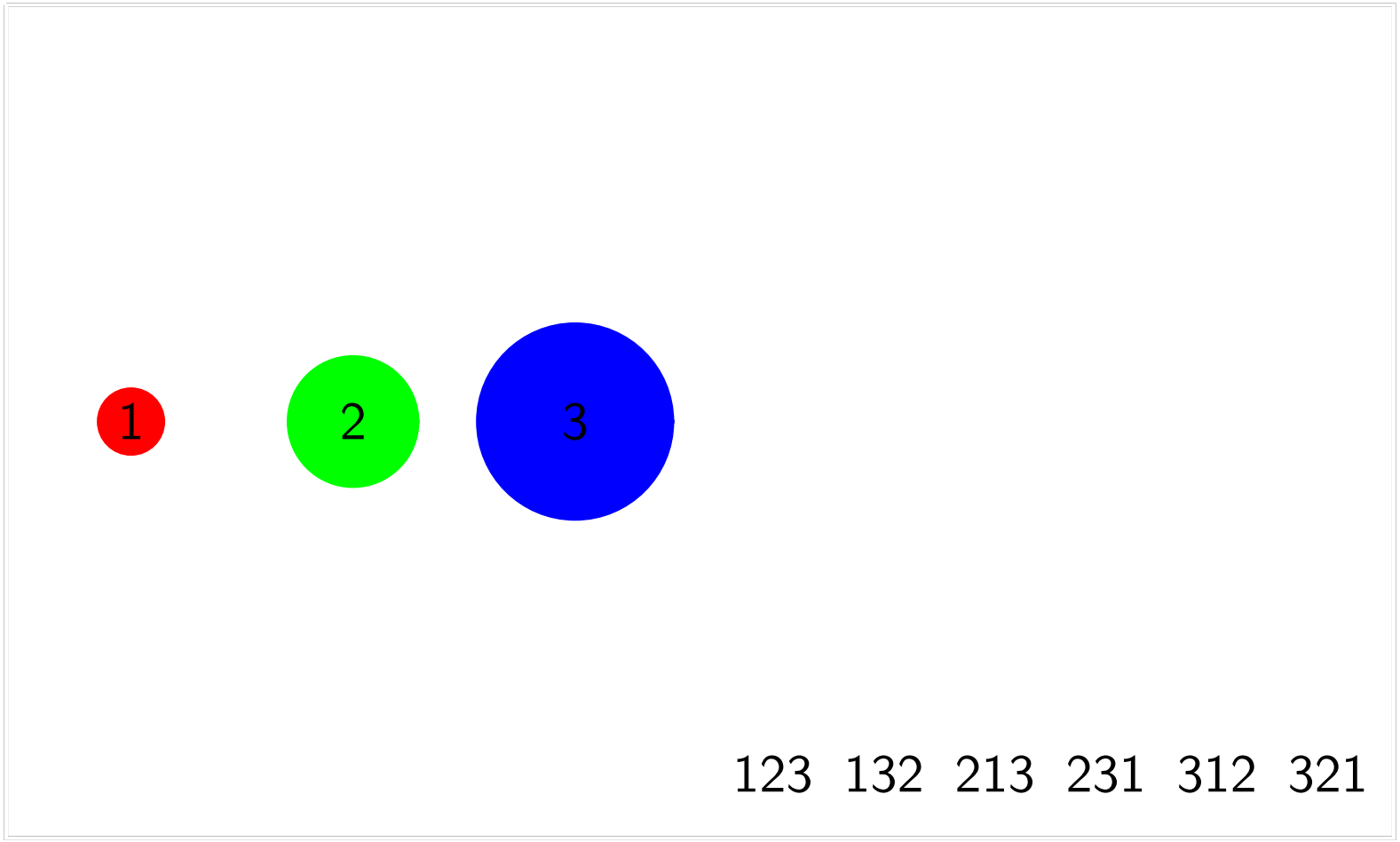
1. Students have observable characteristics (groups), and
2. Maybe planer knows something about students' preferences.

- Focus on ordinal mechanisms that have,

1. Efficiency,
2. Within-group Envy-freeness, and
3. Within-group Symmetry.

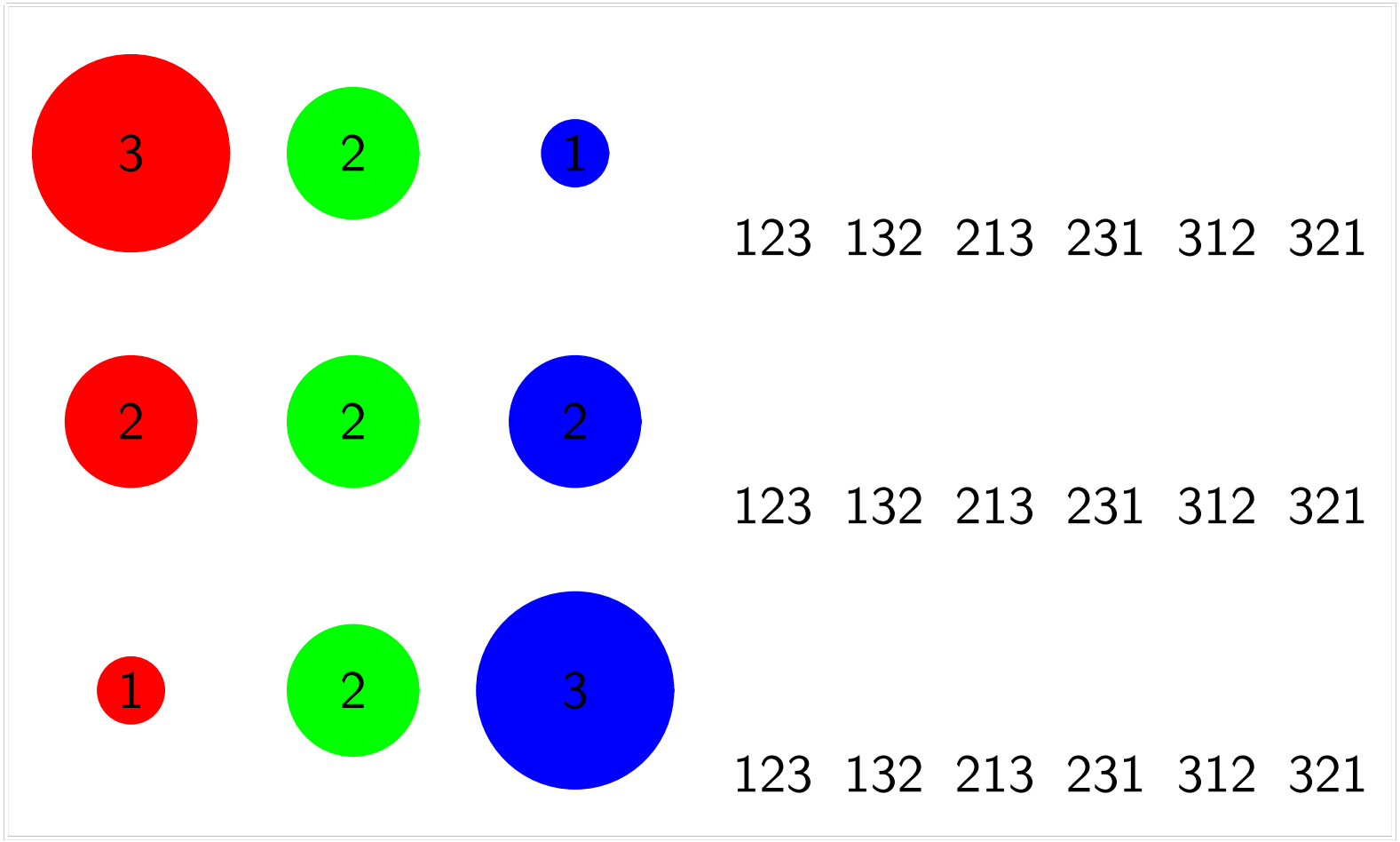
Probabilistic Serial Mechanism

1 School



Modified Probabilistic Serial Mechanism

3 Schools



Sub-capacities

- To find an ordinal mechanism that maximizes cardinal utilities, the planner

1. Chooses sub-capacities (convex programming problem),
2. Runs modified probabilistic serial mechanism.

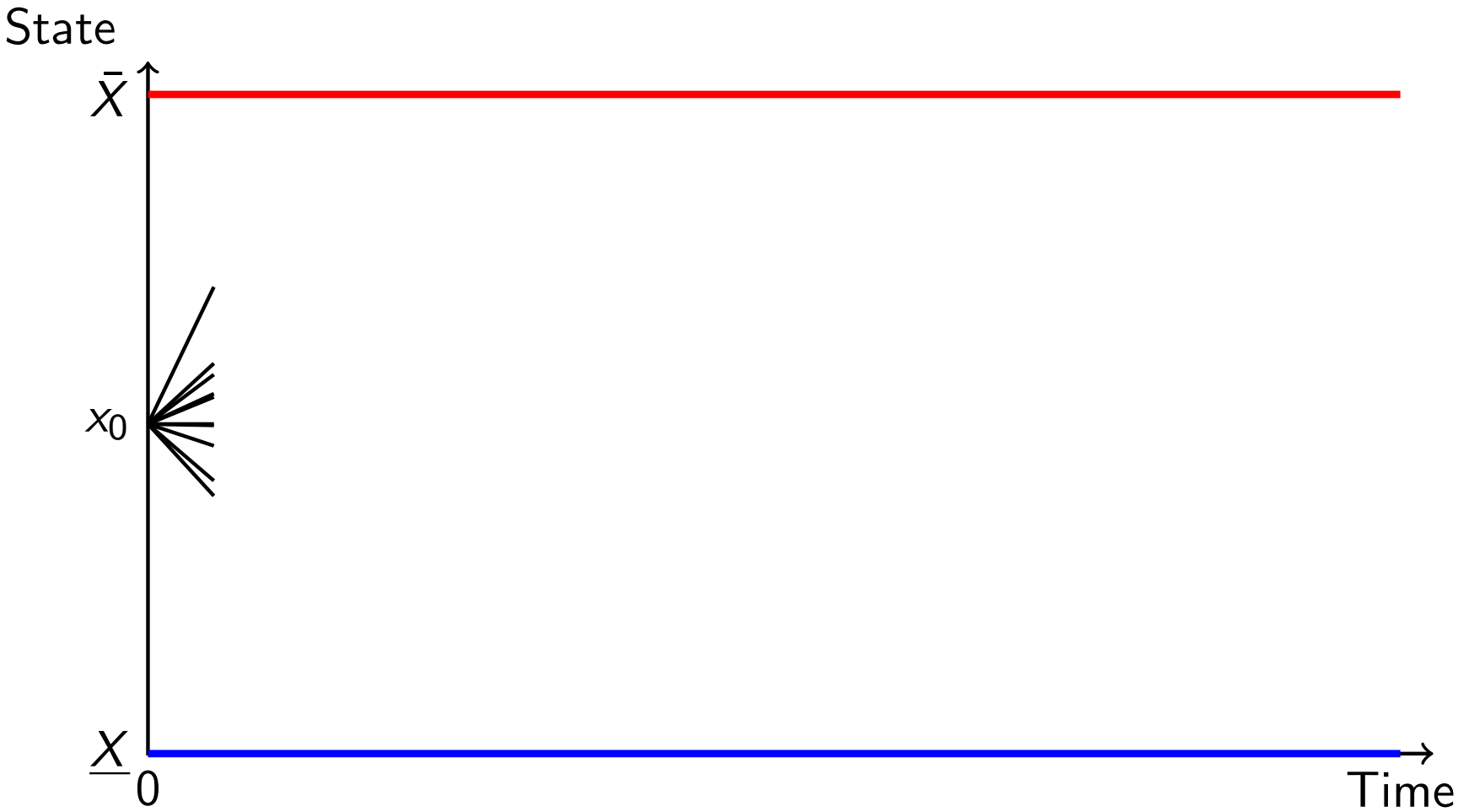
Chapter 3

Mechanism Design for Stopping Problems with Two Actions

- Principal-agent problem in which,

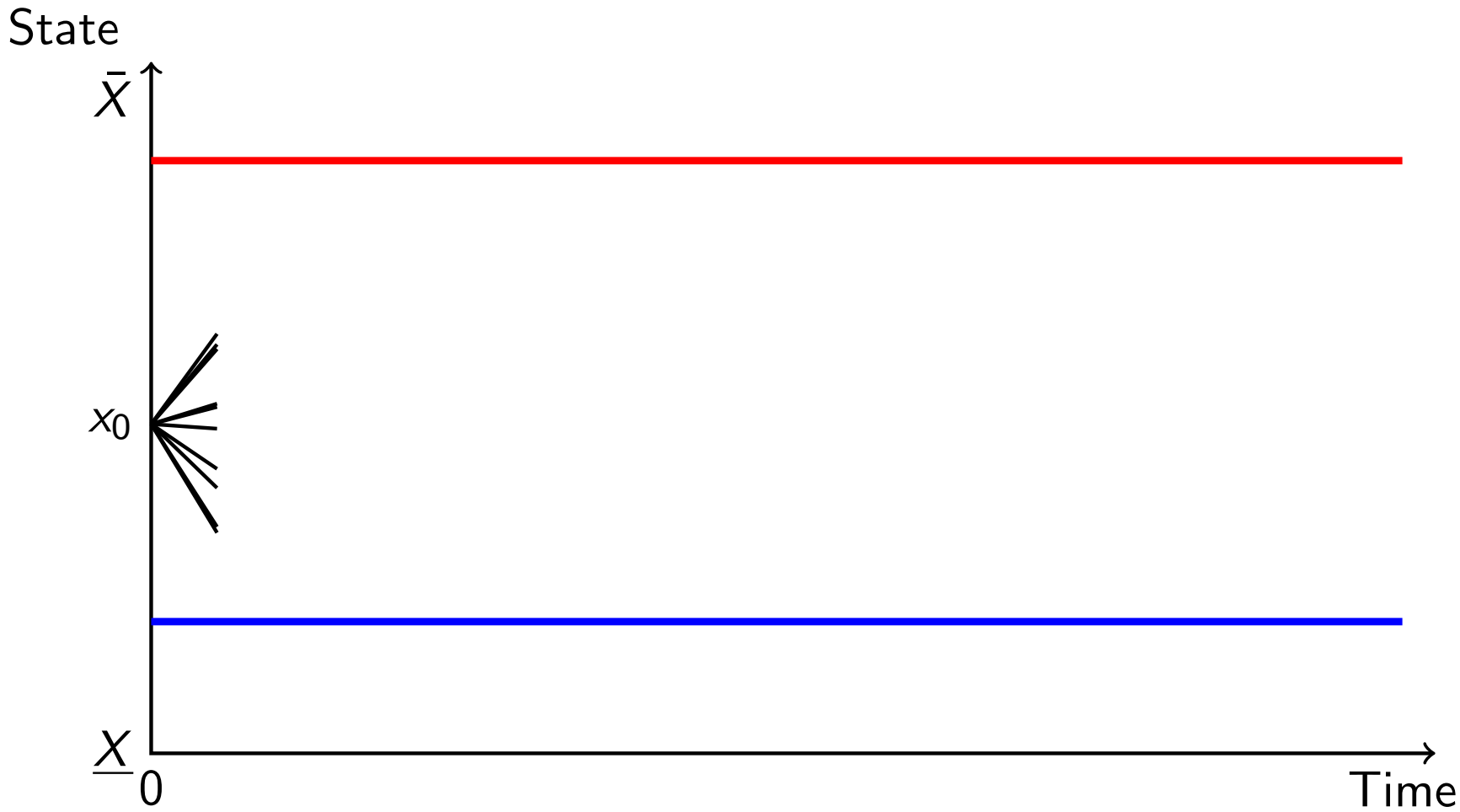
1. Agent observes Markov stochastic process,
2. Agent chooses when to stop and one of two actions, and
3. Principal uses transfers to implement stopping decision rules.

A Threshold Stopping Decision Rule



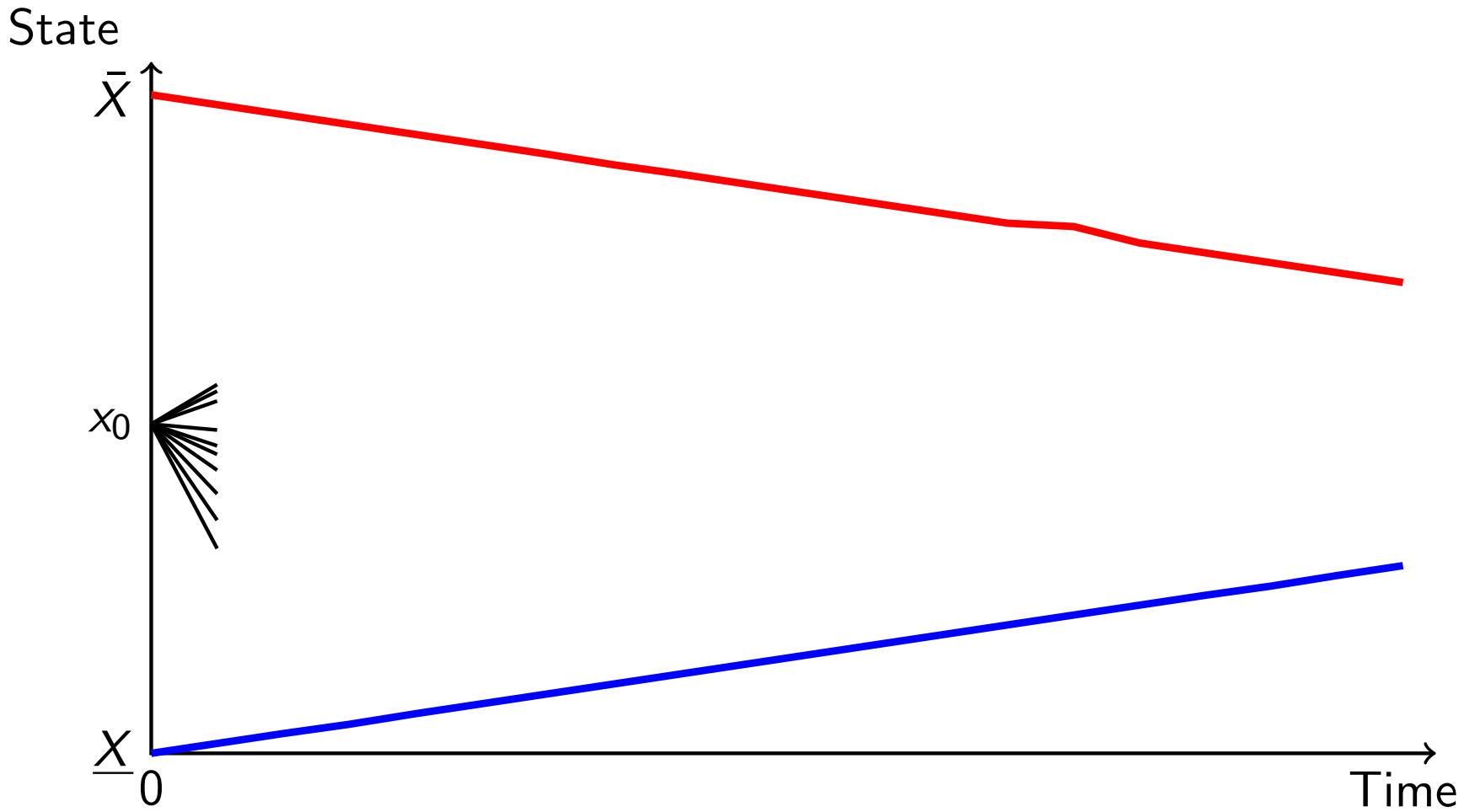
An Implementable Stopping Decision Rule

Example 1



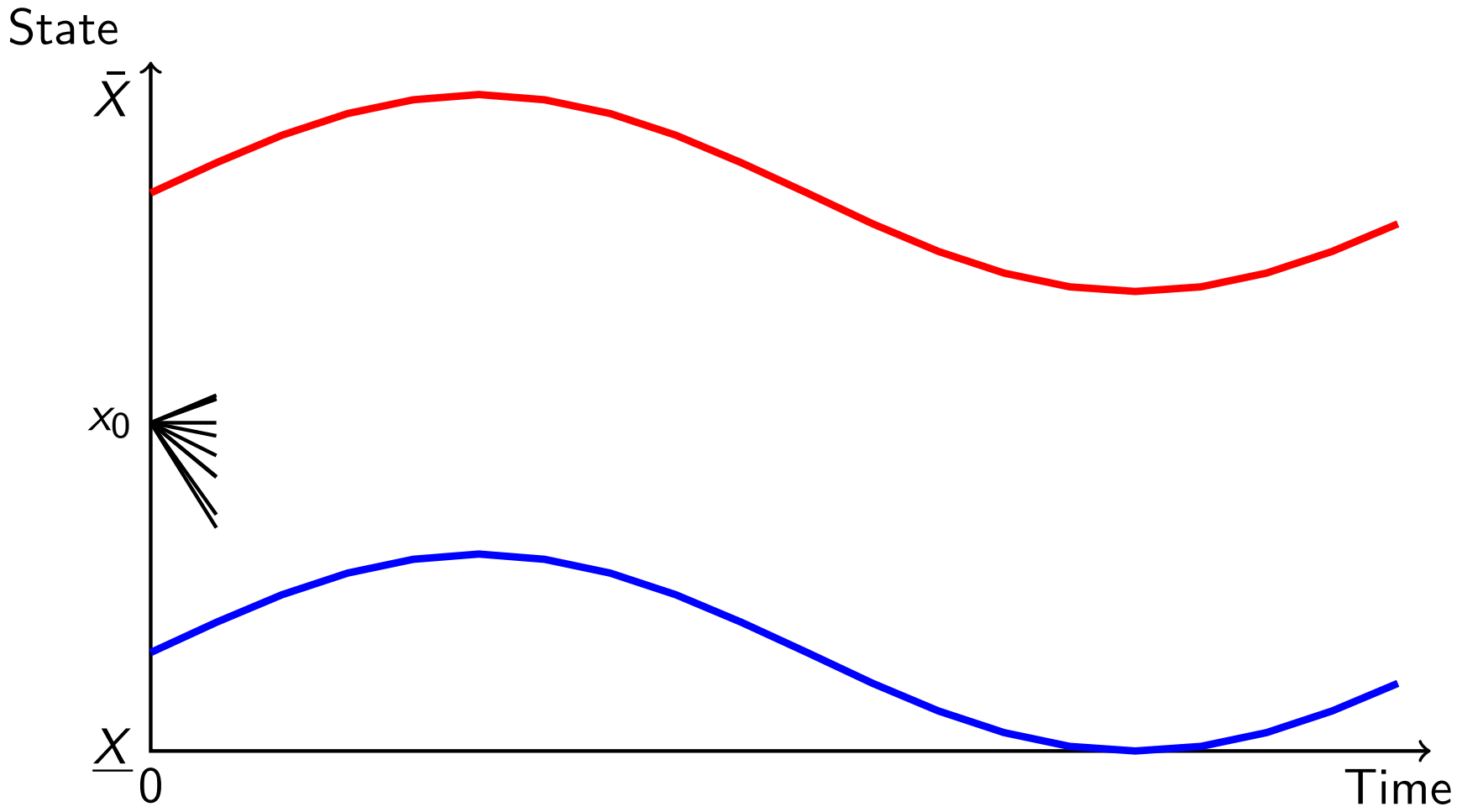
An Implementable Stopping Decision Rule

Example 2



An Implementable Stopping Decision Rule

Example 3



Conditions Required

- On the stochastic process,

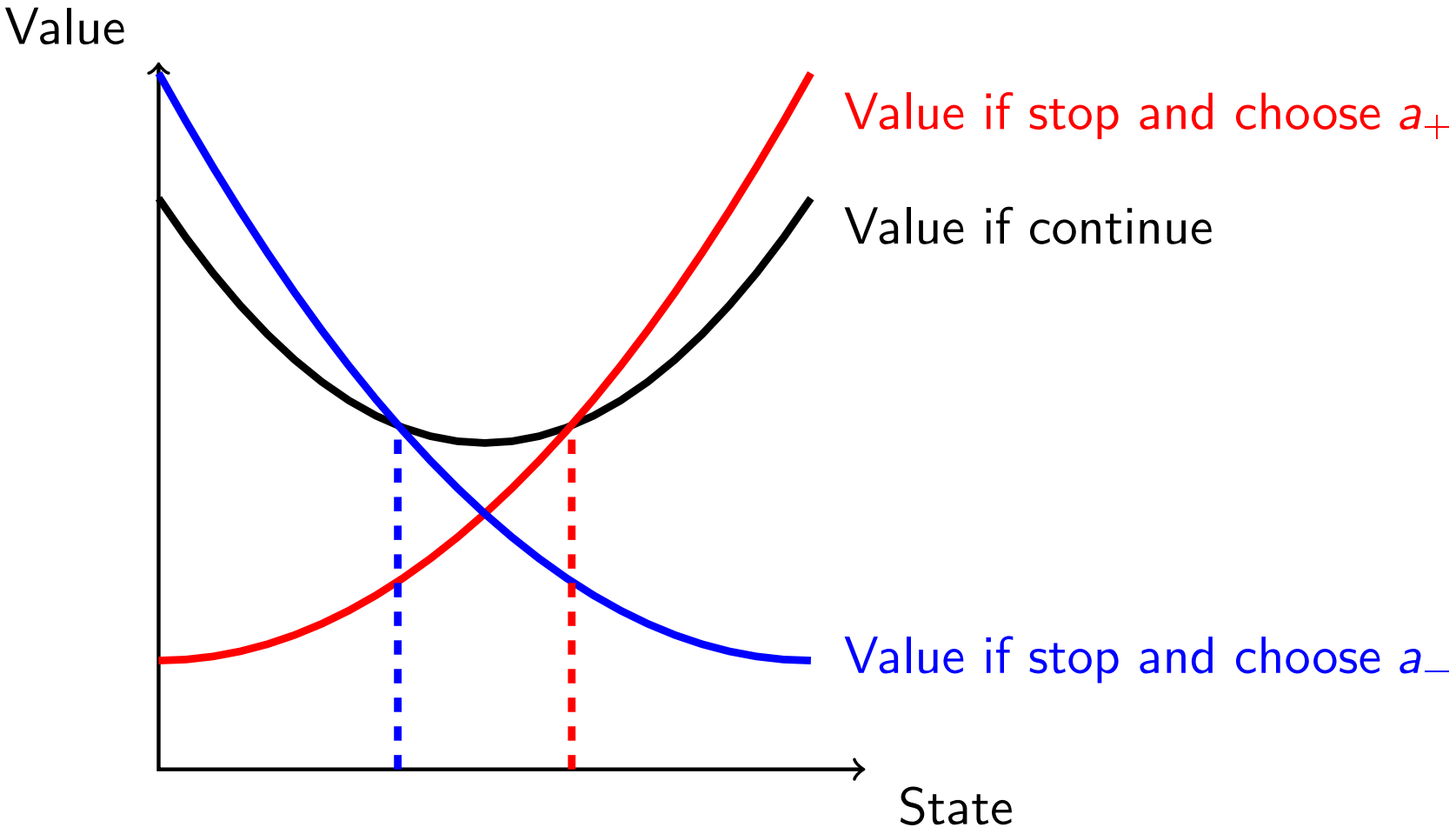
1. Monotonic transition,
2. Continuous transition, and
3. Full support.

- On the utility functions,

1. Spence-Mirrlees Condition (monotonicity), and
2. Modified Pavan-Segal-Toikka (single-crossing).

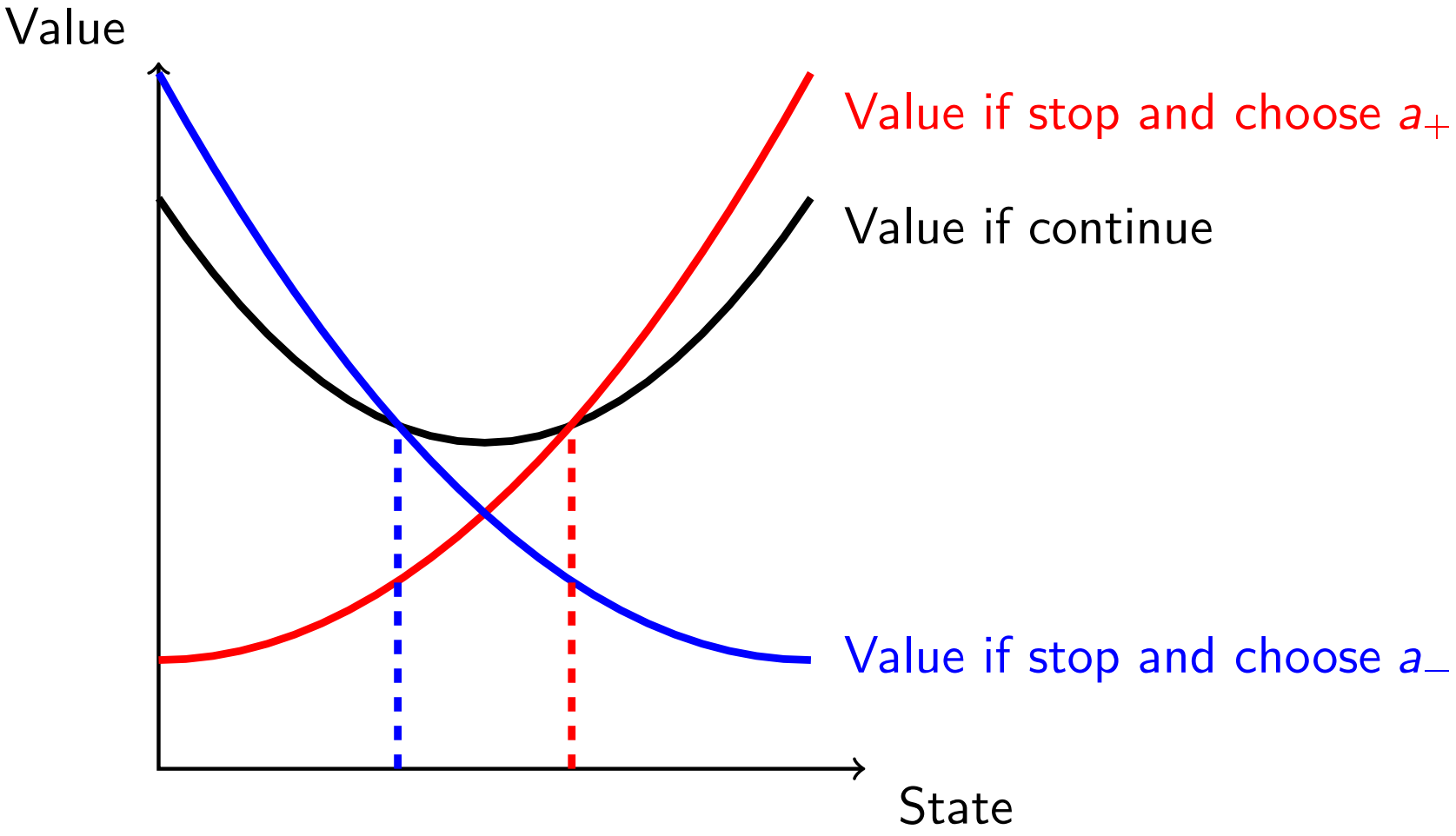
Single Crossing Conditions

Example 1



Single Crossing Conditions

Example 2



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