THE ROLE OF (NEGATIVE) EMOTIONS IN SELF-CONTROL

Joaquin G. Miñambres and Eric Schniter

Economic Science Institute at Chapman University

SABE, Granada, July 2012

Introduction: Motivation

- **Tempting Behavior**: smoking, overeating, overspending, procrastinating, wasting time.

- "**Dual-Self**"

  A person "behaves like two people, one who wants clean lungs and long life and another who adores tobacco, or one who wants a lean body and another who wants dessert. The two are in a continual contest for control". Schelling (1978).

- **Gul and Pesendorfer (2001)** –> Self-control preferences

u –> Normative utility.
v –> Temptation utility.

Introduction: Self-Control Preferences

Stage 1: To choose a menu, M
Stage 2: To choose an offer (action) from the menu, $x \in M$

If *single-self* (u)–> Redundant (Preference for flexibility)
If *dual-self* $(u$ and $v)$:

- Stage 2: Action choice: $\widehat{x} \in \arg\max_{x \in M} [u(x) + v(x)]$
- Stage 1: Menu choice:

$$\begin{aligned} W^{GP}(M) &= \max_{x \in M} [u(x) + v(x)] - \max_{x \in M} v(x) = \\ &= u(\widehat{x}) - \left[\max_{x \in M} v(x) - v(\widehat{x}) \right]. \end{aligned}$$

Costly self-control (Preference for commitment)**:**

$$C(x, M) = \max_{x \in M} v(x) - v(\widehat{x})$$

Introduction: Research Goals

Non stationary evidence: *Compensatory feasting and fasting cycles.* (Kurth et al. (1995), Foster et al. (2005), Mukhopadhyay et al. (2008))

Our purpose:

- History of self-control decisions (*emotions*) affecting subsequent preferences in a dynamic self-control model.
- Implications for choices from menus: Non-stationary consumption path.
- Implications for choices of menus. Preference for commitment vs Preference for flexibility.

The Model: Set Up

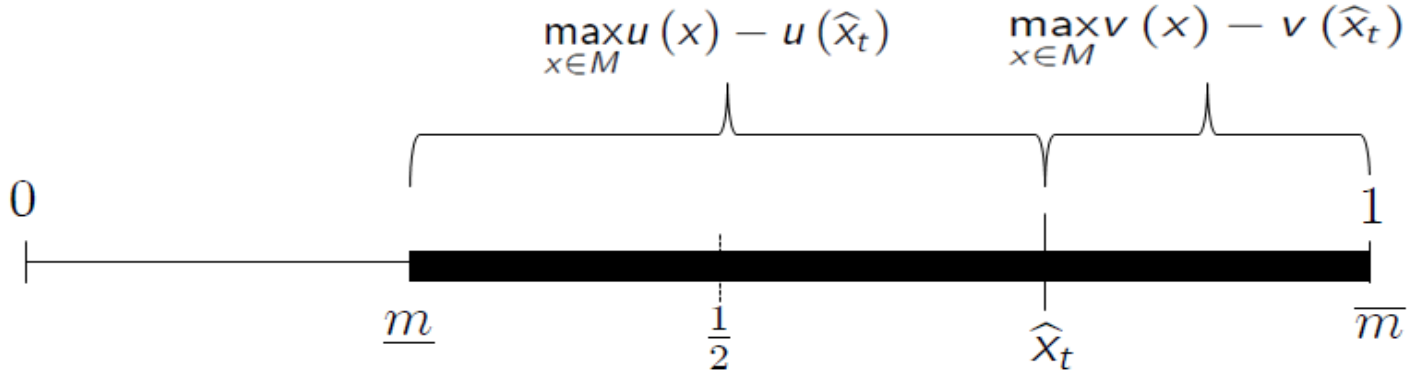
One agent, $t \in \{1, 2, .., T\}$.

Hotelling specification

Action $x_t \in M$ where $M \equiv [\underline{m}, \overline{m}] \subseteq [0, 1]$ with $\underline{m} \leq \overline{m}$

$$\begin{aligned} u(x_t) &= s - t(x_t, 0), \\ v(x_t) &= s - t(x_t, 1). \end{aligned}$$

where $t(x, \theta) = (\theta - x)^2$ with $\theta \in \{0, 1\}$



The Model: Emotional Capital

Effort capital

$$e_{t+1} = (1-\lambda)\, e_t + \left[\max_{x \in M} v(x) - v(\widehat{x}_t)\right],$$

Regret capital

$$g_{t+1} = (1-\lambda)\, g_t + \left[\max_{x \in M} u(x) - u(\widehat{x}_t)\right].$$

where, $e_1 \in \mathbb{R}_+$, $g_1 \in \mathbb{R}_+$ and $1-\lambda \in [0,1]$ –> *Emotional memory*.

Emotional balance

$$B_{t+1} \equiv e_{t+1} - g_{t+1} = (1-\lambda) B_t + (1-2x_t) + \mu$$

where, $\mu = \underline{m}^2 - (1-\overline{m})^2$ (>0 Tempt. shifted, <0 Normat. shifted)

The Model: Representation

Extended utility functions

$$\begin{aligned} U(x_t, e_t) &= u(x_t) - \rho\varepsilon(x_t, e_t) \\ V(x_t, g_t) &= v(x_t) - \rho\gamma(x_t, g_t) \end{aligned}$$

$\rho \in \mathbb{R}_+$ –> Impact of emotions in utility functions.

Emotional cost functions

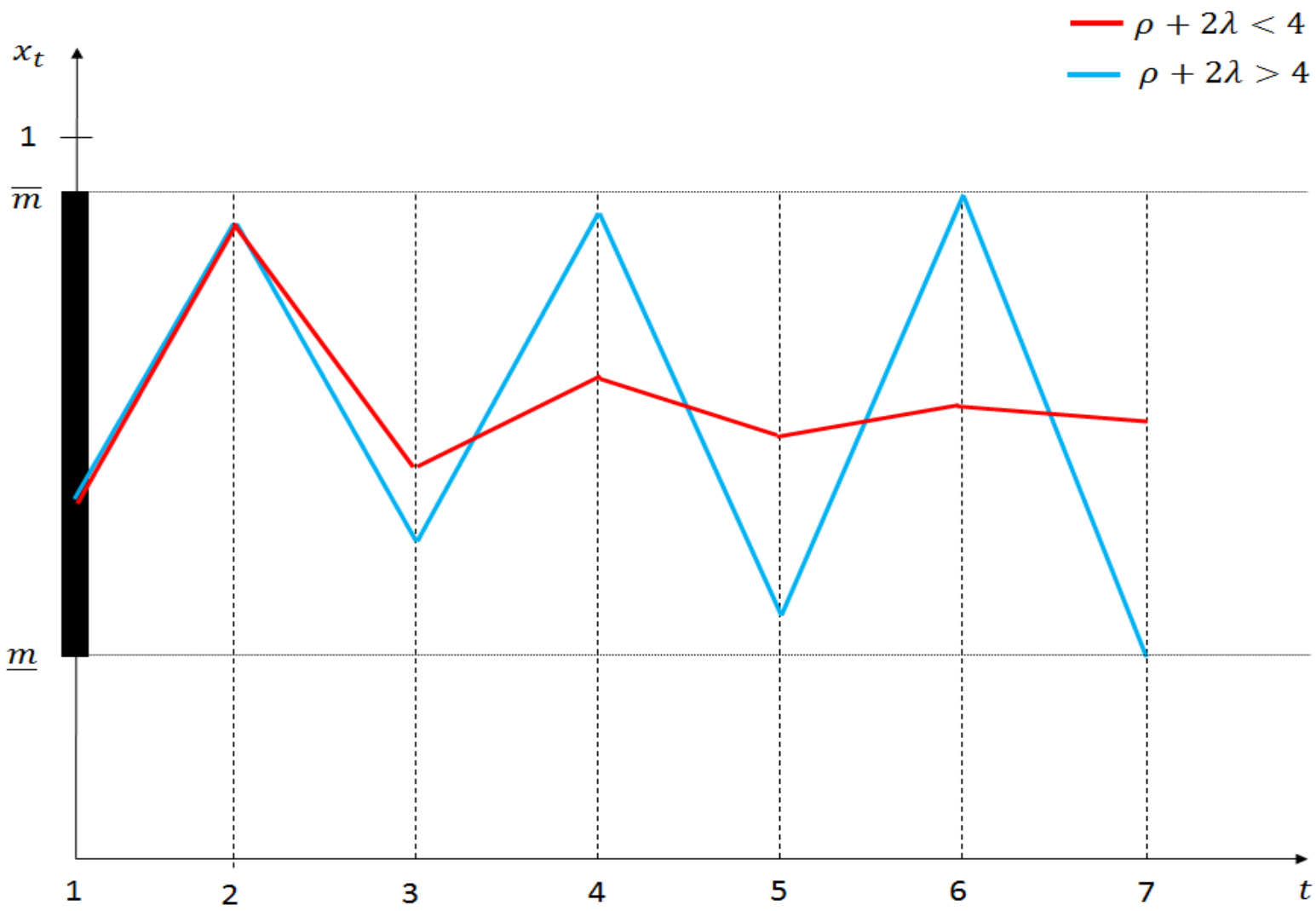
$$\varepsilon(x_t, e_t) = e_t(1 - x_t) \quad \text{and} \quad \gamma(x_t, g_t) = g_t x_t.$$

Emotional self-control representation

$$W_t(M) = \max_{x \in M} U(x, e_t) + V(x, g_t) + \delta W_{t+1}$$

where $\delta \in [0, 1]$

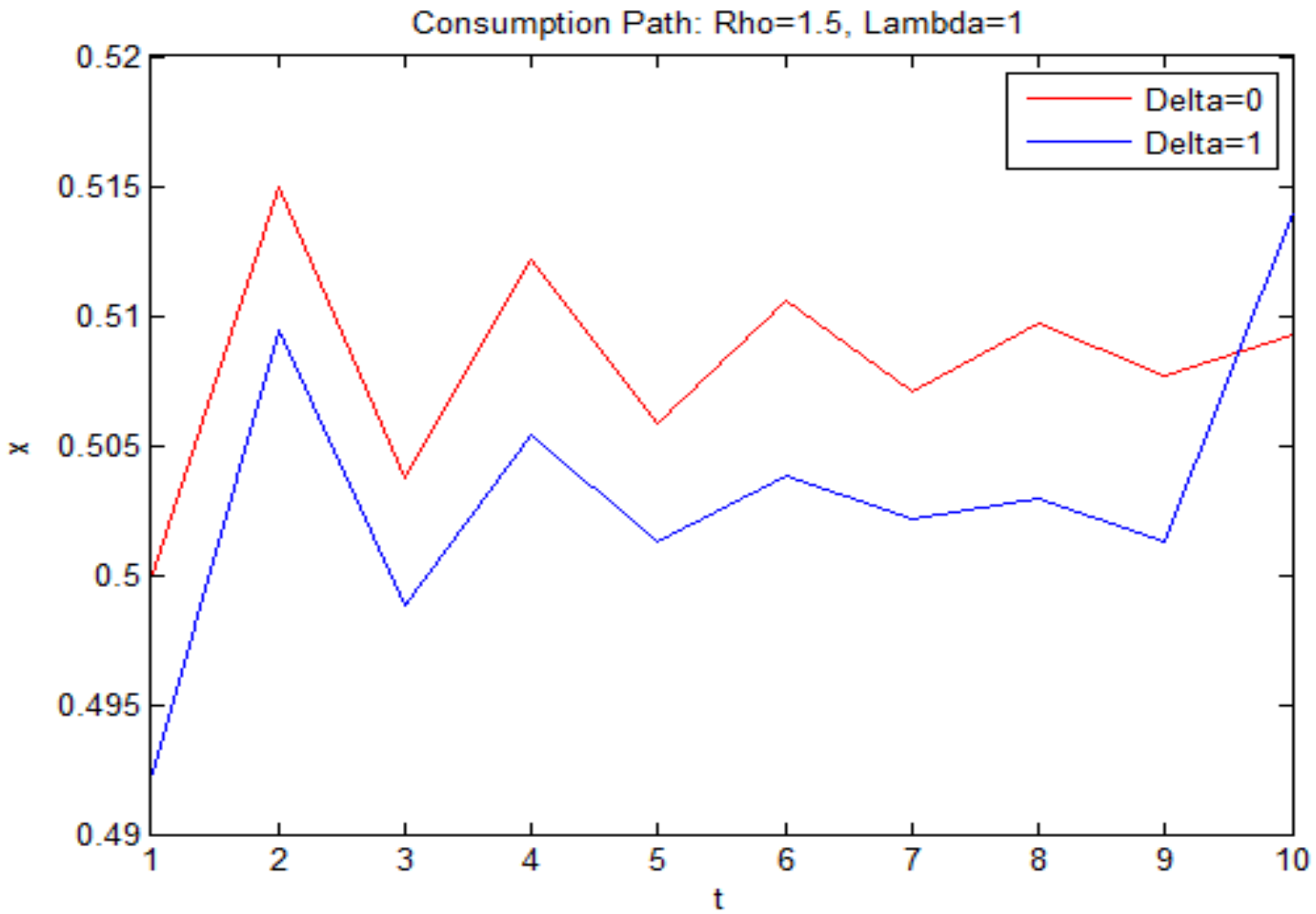
Optimal Consumption Path: Myopic (delta=0)



Optimal Consumption Path: M=[0.3,1]

Short Emotional Memory (Lambda=1)

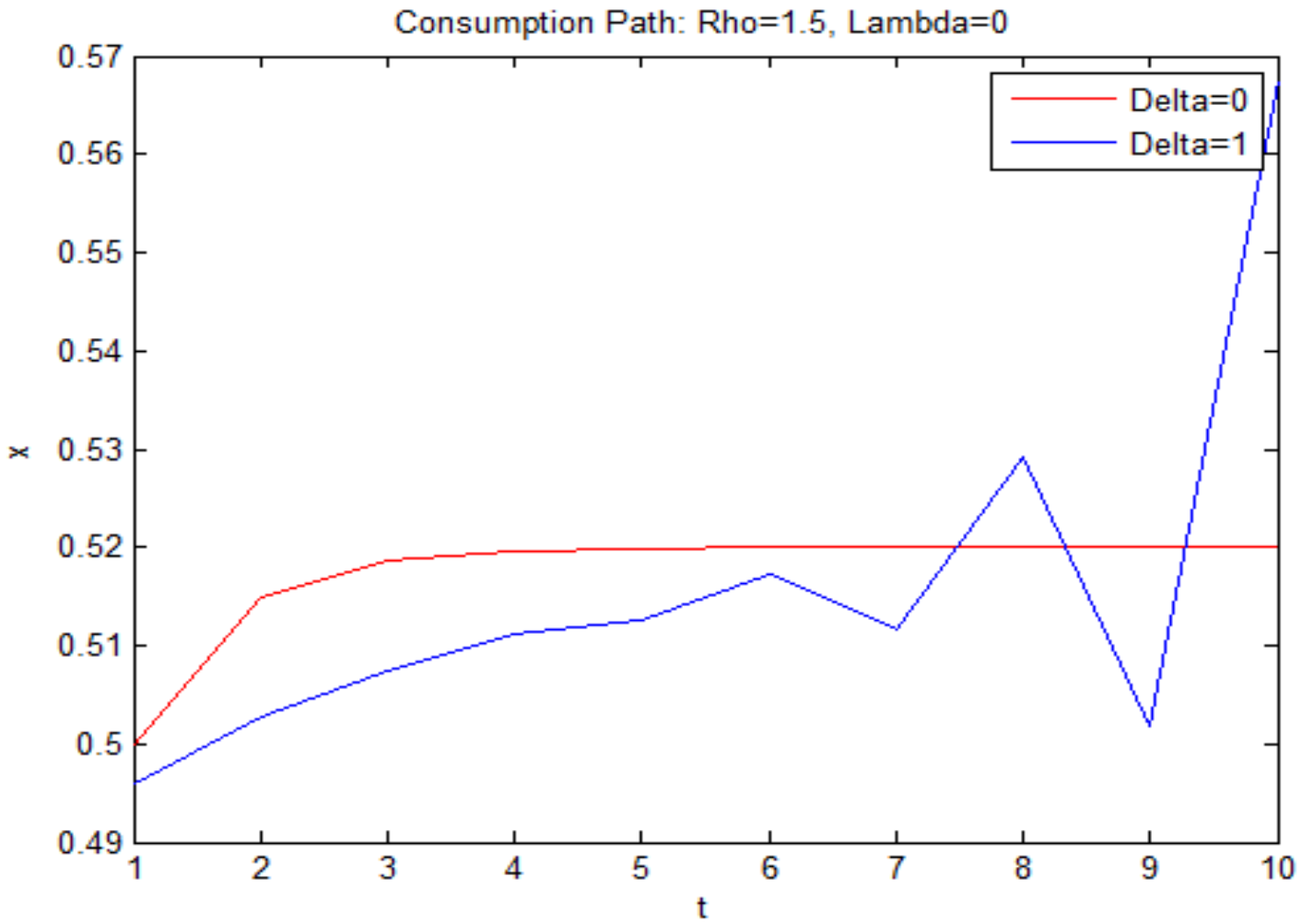
Compensatory Binge and Fasting Cycles.



Optimal Consumption Path: M=[0.3,1]

Long Emotional Memory (Lambda=0)

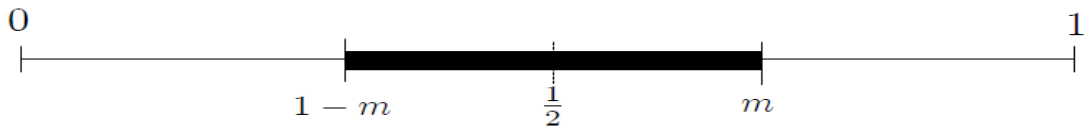
Last Period Craving Effect.



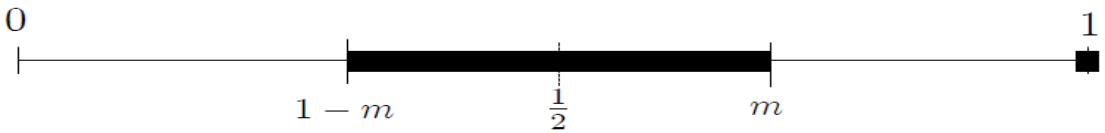
Menu Uncertainty and Commitment: Set Up

(1) Set of options: Commitment menu (M) and Menu extension (Z)

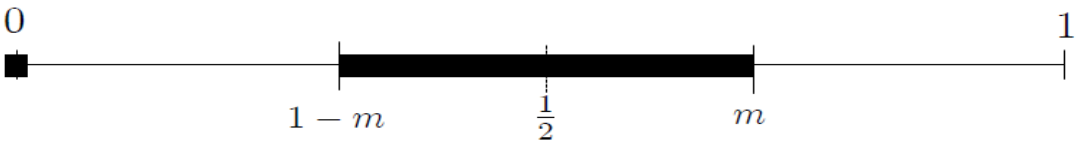
$$M \cup Z = [1-m, m] \text{ with probability } (1-p).$$



$$M \cup Z = [1-m, m] \cup \{1\} \text{ with probability } p/2.$$



$$M \cup Z = [1-m, m] \cup \{0\} \text{with probability } p/2.$$



Interpretation: **M** food in the refrigerator and **Z** commercials.

(2) The consumer chooses m before the realization of Z in period 1.

Menu Uncertainty and Commitment: Results

Result: Limited Flexibility

For all $\rho > 0$, there exist an optimal commitment menu m^* with $m^* > \frac{1}{2}$ iff p sufficiently large.

Corollary: Comparative statics

$$\frac{\partial m^*}{\partial p} \geq 0, \ \frac{\partial m^*}{\partial \delta} \geq 0 \text{ and } \frac{\partial m^*}{\partial \rho} \geq 0.$$

Intuition: Commitment with some (not full) flexibility in order to adapt his consumption to the emotions created by the uncontrolled alternatives.

> *"The only way to get rid of a temptation is to yield to it. Resist it, and your soul grows sick with longing for the things it has forbidden to itself" (Oscar Wilde, The Picture of Dorian Gray, 1891)*