Lecture 5: Public Policy to Combat Errors

EC 404: Behavioral Economics
Professor: Ben Bushong

November 16, 2021

Overview

- A major theme in behavioral economics: In some contexts, people make errors that lead them not to behave in their own best interests.

- If so, should policy analysis take such errors into account?
  - That is, in addition to the usual considerations, if a policy combats errors, that's good, and if a policy exacerbates errors, that's bad.
  - This question can be quite contentious, because it gets people thinking about the nasty "P" word:

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What is "paternalism"?

To some, "paternalism" means restricting choice sets (telling people there are certain things they cannot do).

- Examples: Bans on smoking, drinking, gambling, etc.

Two puzzling reactions to behavioral economics and public policy based on this perspective:

- "Public policy to combat errors means paternalism, and paternalism means restricting choice sets, and restricting choice sets is bad — because we shouldn't tell people what to do."
  - BUT "public policy to combat errors" need NOT involve "restricting choice sets"!
- "Many of the supposed paternalistic policies discussed by behavioral economists are in fact not paternalistic policies because they do not restrict choice sets."
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What is "paternalism"?

To behavioral economists, "paternalism" means designing policy with an eye towards how that policy might help people make better choices (or cause them to make worse choices).

- Includes restricting choice sets (e.g., bans), but also includes changing choice sets (e.g., budget-neutral taxes that alter relative prices), and sometimes even expanding choice sets (e.g., introducing and enforcing voluntary commitment devices).
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Is "paternalism" justified?

My answer: I don't know — I suspect it probably is, but more investigation is required.

Three major issues:

- Avoid Ideology — Embrace Analysis.
- Is it ok to help those who make errors to the detriment of those who do not?
- But what if firms are hurt (i.e., earn reduced profits)?

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A "Cautious" Approach

Initial approach:

"Libertarian Paternalism" (Thaler & Sunstein, ChiLaw 2003)
"Asymmetric Paternalism" (Camerer *et al*, PennLaw 2003)
"Soft Paternalism" (*Economist*, April 8, 2006)
Nudge (Thaler & Sunstein, 2008)

- We need to proceed cautiously, because it's hard to be certain that people are making errors — to know the prevalence of errors in the population and the severity of errors in the population.
- Hence, let's identify policies that would be helpful for people making errors but mostly irrelevant for rational people.
- The ideal is a policy that helps people making errors, has no effect on rational people, and has zero implementation costs.

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Some Examples of this "Cautious" Paternalism

(1) Rules for default outcomes.

- Many public policies "require" a response from citizens, and hence must specify a "default" outcome for citizens that do not respond.
  - Example: Electricity deregulation and choosing a provider.
- Firms sometimes set up "default" actions that are implemented unless a customer actively says to do otherwise.
  - Example: Automatic renewals of subscription services.
- Whereas the standard model would say such default outcomes are mostly irrelevant, evidence suggests otherwise.
- Hence, perhaps there is scope for policy to help shape (or restrict) the setting of default outcomes.

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(2) Rules for the framing of information.

- Whereas the standard model would say that how we describe or frame a choice situation is mostly irrelevant, evidence suggests otherwise.
- Hence, perhaps there is scope for policy to restrict framing a choice in a way that leads people to make worse decisions.
  - Example: rent-to-own contracts:
    - Contract 1: Here's a $300 TV. You can rent it for $40 per month, and if you rent it for one year, it's yours. (You can return the TV and stop paying rent at any time.)
    - Contract 2: Here's a $300 TV. You can buy it on credit, specifically by paying us back in 12 monthly installments at an interest rate of 120%, or $40 per month. (You can return the TV and stop making payments at any time, although you will not get back any prior payments.)

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(3) Cooling-off laws — give people a short duration to back out of their decisions.

- Sometimes people make decisions "in the heat of the moment" that they later regret (e.g., due to projection bias).
- Hence, perhaps there is scope for policy that gives people a chance to "cool off" and assess whether they are happy with their decisions.
- In fact, such laws are implemented in many states for purchases from door-to-door salesmen, marriage, and divorce.

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"Optimal Paternalism"

"Optimal Paternalism": formally analyze optimal policy as a function of our beliefs about the degree of and prevalence of errors in the population.

- Write down assumptions about:
  - types of errors that people make.
  - distribution of errors in the population (prevalence and magnitude).
  - available policy instruments.
  - government's information about agents.
- Then investigate which policies achieve the "best" outcomes.
- Goal: By doing so, we can more fully understand the benefits and costs of paternalism.
  - Embrace analysis!

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An Example of "Optimal Paternalism": Optimal Sin Taxes

Optimal Sin Taxes
[based on O'Donoghue & Rabin (*AER* 2003)]

- Suppose you consume potato chips (x) and money (z).
- Potato chips are a "sin" good in the sense that they create negative health consequences in the future.
- If you have self-control problems, you will be prone to over-consume potato chips — to consume more than you would like from a long-run perspective.
- Should we tax potato chips to induce people to consume less (and return the tax proceeds via a lump-sum transfer)?

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Optimal Sin Taxes: Model

A simple model:

(Total Utility) = (Chip Utility) + (Money Utility).

(Money Utility) = z.

(Chip Utility):

- Let $v(x) \equiv$ immediate eating pleasures from potato chips.
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Assume β, δ preferences with $\delta = 1$.

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Behavior: The person will choose (x, z) to maximize

$$u^*(x, z) = [v(x) - \beta c(x)] + z.$$

Welfare: The person's long-run utility is

$$u^{**}(x, z) = [v(x) - c(x)] + z.$$

For simplicity, assume $v(x) = \rho \ln x$ and $c(x) = \gamma \ln x$, in which case:

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Optimal Sin Taxes: Model

A few more assumptions:

- Potato chips are produced with constant returns to scale, with a marginal cost of 1.
- The potato-chip market is competitive:
  - In the absence of taxes, market price of potato chips is 1.
  - If the government imposes a per-unit tax t on potato chips, market price of potato chips is $1 + t$.
- The government might give you a lump-sum transfer ℓ (recall: tax proceeds will be returned to consumers via lump-sum transfers).
- Given an income I (that is "large" relative to potato-chip consumption), your consumption of money will be

$$z = I + \ell - (1 + t)x.$$

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Optimal Sin Taxes: Behavior

The *first-best outcome* is the (x^{**}, z^{**}) that maximizes welfare u^{**} given $t = \ell = 0$. Substituting $z = I - x$, x^{**} maximizes

$$u^{**}(x, z) = [(\rho - \gamma) \ln x] + I - x$$

$$\Longrightarrow x^{**} = \rho - \gamma \qquad [\text{and } z^{**} = I - (\rho - \gamma)]$$

As a function of t and ℓ, actual behavior x^* maximizes

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Example: Suppose $\rho = 60$, $\gamma = 50$, $\beta = 0.9$, and $I = 200$.

First-best outcome: $x^{**} = 10$ and $z^{**} = 190$.

Actual behavior (given $t = 0$): $x^{*} = 15$ and $z^{*} = 185$.

Note: $(x = 15, z = 185)$ "better" than $(x = 10, z = 185)$ because it yields a larger u^{**}.

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Optimal Sin Taxes: Benchmark Results

Benchmark results:

- If $t = 0$, then $\beta = 1$ implies $x^* = x^{**}$.
  - Standard agents consume optimally in the absence of taxes.
- If $t = 0$, then $\beta < 1$ implies $x^* > x^{**}$.
  - People with self-control problems are prone to over-consume sin goods such as potato chips.
- If $t = t^{**} \equiv \gamma(1-\beta)/(\rho-\gamma)$, then $x^* = x^{**}$.
  - A sin tax on potato chips (and a lump-sum transfer) can implement the first-best outcome.
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Optimal Sin Taxes: Introducing Heterogeneity

More realistically, people differ in:

- their tastes for potato chips (ρ)
- their susceptibility to health problems from potato chips (γ)
- their degree of self-control problems (β)

If so, implementing the first-best outcome requires individual-specific taxes and lump-sum transfers, which are unrealistic.

What is the "optimal" uniform tax and lump-sum transfer?

- Note: If everyone has $\beta = 1$, the optimal tax is $t = 0\%$ (which implements the first-best outcome for everyone).

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A simple version of heterogeneity:

- Suppose everyone has $\rho = 60$ and $\gamma = 50$.
- Suppose that 80% of the population has $\beta = 1$ (δ-types), while 20% of the population has $\beta = .9$ (β-types).

If we weight everyone equally, what is the optimal uniform tax and lump-sum transfer?

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- Suppose that 80% of the population has $\beta = 1$ (δ-types), while 20% of the population has $\beta = .9$ (β-types).

If we weight everyone equally, what is the optimal uniform tax and lump-sum transfer?

Optimal Sin Taxes: Solving for the Optimal Tax

Step 1: As a function of the tax t, what is the uniform lump-sum transfer?

As a function of t, δ-types consume

$$x_\delta^*(t) = \frac{\rho - \beta\gamma}{1+t} = \frac{10}{1+t}$$

As a function of t, β-types consume

$$x_\beta^*(t) = \frac{\rho - \beta\gamma}{1+t} = \frac{15}{1+t}.$$

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[Using the results from the previous slide]

As a function of t, average consumption is

$$X^*(t) = 0.8 * x^*_\delta(t) + 0.2 * x^*_\beta(t) = \frac{11}{1+t}.$$

Hence, the lump-sum transfer is

$$\ell(t) = t * X^*(t) = \frac{11t}{1+t}.$$

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Optimal Sin Taxes: Solving for the Optimal Tax

Step 2: As a function of t, what is social welfare?

As a function of t, welfare for δ-types is

$$\begin{aligned} u_\delta^{**}(t) &= (\rho - \gamma) \ln x_\delta^*(t) + I + \ell(t) - (1+t)x_\delta^*(t) \\ &= 10 \ln \left(\frac{10}{1+t} \right) + I + \frac{11t}{1+t} - (1+t) \left(\frac{10}{1+t} \right) \end{aligned}$$

As a function of t, welfare for β-types is

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Weighting everyone equally, social welfare is

$$\Omega(t) = 0.8 * u_\delta^{**}(t) + 0.2 * u_\beta^{**}(t).$$

Optimal Sin Taxes: Solving for the Optimal Tax

Step 3: Solve for the optimal tax.

$$\text{Claim: } t^* = 10\%.$$

Hence, if we weight everyone equally, the optimal tax is $t^* = 10\%$.

Even if the prevalence of self-control problems is relatively small, it can be optimal to impose significant taxes on sin goods.

- Intuition: Starting from $t = 0\%$, sin taxes create large benefits in terms of reducing over-consumption by people with self-control problems, while causing relatively little distortion in the potato-chip consumption of fully rational people.

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Optimal Sin Taxes: Who is Hurt?

Helping the β-types to the detriment of the δ-types:

For the β-types:

$$u_\beta^{**}(t = 0\%) = 10 \ln(15) + I - (1)(15) = I + 12.081$$

$$u_\beta^{**}(t = 10\%) = 10 \ln\left(\frac{15}{1.1}\right) + I + \frac{11(.1)}{1.1} - (1.1)\left(\frac{15}{1.1}\right) = I + 12.127$$

For the δ-types:

$$u_\delta^{**}(t = 0\%) = 10 \ln(10) + I - (1)(10) = I + 13.026$$

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It turns out that everyone is better off!

- In other words, $t = 10\%$ is Pareto-superior to $t = 0\%$.

Intuition: β-types helped because sin taxes counteract over-consumption. At the same time, because β-types consume more potato chips than δ-types, while everyone gets the same lump-sum transfer, income is naturally redistributed from β-types to δ-types.

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More generally, it may not be the case that everyone is helped. For instance, suppose:

- People have different tastes for potato chips (ρ), where the average ρ in the population is 60.
- People have different susceptibilities to health problems from potato chips (γ), where the average γ in the population is 50.

It turns out that, weighting everyone equally, the optimal tax is still 10%.

However, a 10% tax might not make everyone better off — in particular, a δ-type with a large ρ and a small γ (for whom optimal potato-chip consumption is large) is likely to be hurt.

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Claim:

- Even so, the β-types and δ-types are still both on average better off.

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Optimal Sin Taxes: Concluding Thoughts

Bottom line:

- If some people are prone to over-consume sin goods, it might be useful to tax sin goods to counteract this over-consumption, and use the proceeds to reduce other taxes.
- In fact, such a policy need not involve helping people making errors to the detriment of fully rational people.

Of course, there are other issues that must be addressed before implementing such taxes:

- Are such taxes regressive?
- Implementation problems (smuggling, bureaucracy)?

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Analysis of Policy: CFL vs Incandescent Light-bulbs

[Based on Allcott and Taubinsky, *AER* 2015]

Electric utilities in the U.S. spent $252 million promoting compact fluorescent light-bulbs (CFLs) in 2010.

Why subsidize CFLs over standard incandescents?

- If energy prices are below social marginal cost (and cannot be raised due to political constraints).
- Subsidizing new or emerging products might help correct for uninternalized spillovers from R&D or consumer learning.
- Asymmetric information / incentives in real estate markets.
- "Behavioral" reasons.

Analysis above applies to present-bias analysis of CFLs.

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What about *inattentive* consumers?

Put another way, what if consumers do not understand the total cost of ownership of CFLs? Can that explain existing subsidies?

- Experiment provided specific information to consumers.

  For eight years of light, the total costs to purchase bulbs and electricity would be:
  $56 for incandescents: $8 for the bulbs plus $48 for electricity.
  $16 for a CFL: $4 for the bulbs plus $12 for electricity.

Results: Information increases WTP for the CFL by an average of $2.30

In the real world, electricity firms offer ≈$3 subsidies.

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