Behavioral Industrial Organization

A Crash Course

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IO, Behavioral IO, and Today's Lecture

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- **Focus on theory.**

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  - Maintain **profit-maximizing firms**.

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- Look for *symmetric pure-strategy Nash equilibria*.
- Note: majority of models not so reduced form.
  - E.g., Grubb (2009) on cellphones: overconfidence $\Rightarrow$ underestimate variance in demand $\Rightarrow$ penalties for high usage.

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3. Credit cards:
   - f = annual fee.
   - a = interest = interest rate $\times$ borrowing.
   - Consumer thinks future borrowing = 0.

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- By comparison: rational consumers get utility = 0.

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- Note: often, deception seems profitable even in crowded market (e.g., credit cards).
  - Confusion is one potential reason; but not much work on this overall.

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  - "A reverse Robin Hood exercise."

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- Dynamic distortion: exploitative innovation.

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- Level of competition affects participation distortion.
  - Monopolist might generate lower participation distortion.

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- Often, **competition doesn't affect exploitation distortions**.
  - Any firm wants to maximize unanticipated payments (doesn't affect competitive situation).
  - E.g., both monopolist and competitive firms charge a_{max}.

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  1. A high add-on fee (e.g., for roaming, bank overdrafts) leads sophisticated consumers to inefficiently avoid the service (Gabaix and Laibson 2006, Grubb 2015). **Sophisticated-side distortion.**
  2. To induce naive consumers to keep gambling, casinos are overwhelming, offer free alcohol. **Homogeneous distortion.**
  3. Having to pay unexpected charges distorts naive consumers' intertemporal budgeting. **Naive-side distortion.**
- Often, **competition doesn't affect exploitation distortions**.
  - Any firm wants to maximize unanticipated payments (doesn't affect competitive situation).
  - E.g., both monopolist and competitive firms charge a_{max}.
- Type and implications can be sensitive to economic situation $\Rightarrow$ need microfoundation for additional price.

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  - Lenders overlend to exploit. This is a homogeneous distortion.
- Policy must lower misprediction.
  - Classical disclosure doesn't work.
  - Interest rate caps or limits on back-loaded repayment do.
  - Maybe educating consumers about themselves too.

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  - Not always true.
- Note: there is also a large literature on second-degree naivete-based discrimination.

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- But many consumers are **fallible**: they make mistakes in evaluating options.

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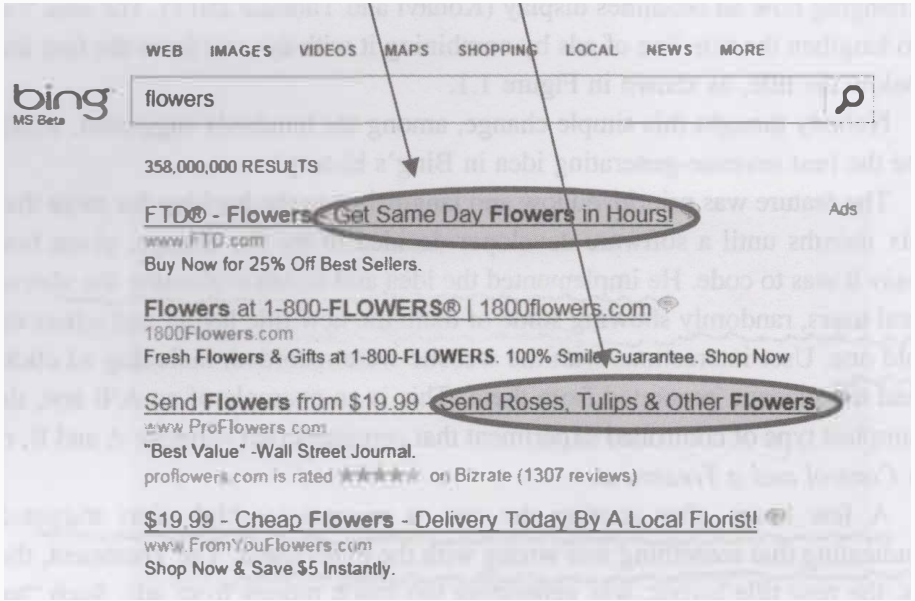
  and $\tilde{v}(\cdot)$ is an exogenously fixed increasing function.
- Intermediary's choice of i is **based on information about consumer**.
- This could be about v_i, m_i, or $\tilde{v}_i$.

A/B Testing

- Internet companies run “A/B tests” to figure out “best” framing of a fixed product.
- E.g., Bing ran A/B tests of following form (Kohavi et al. 2020).



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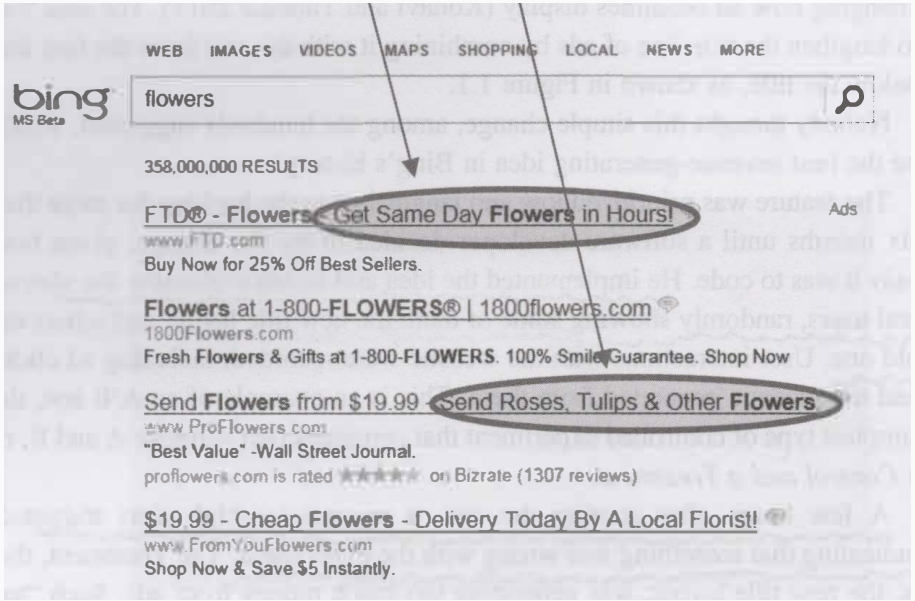

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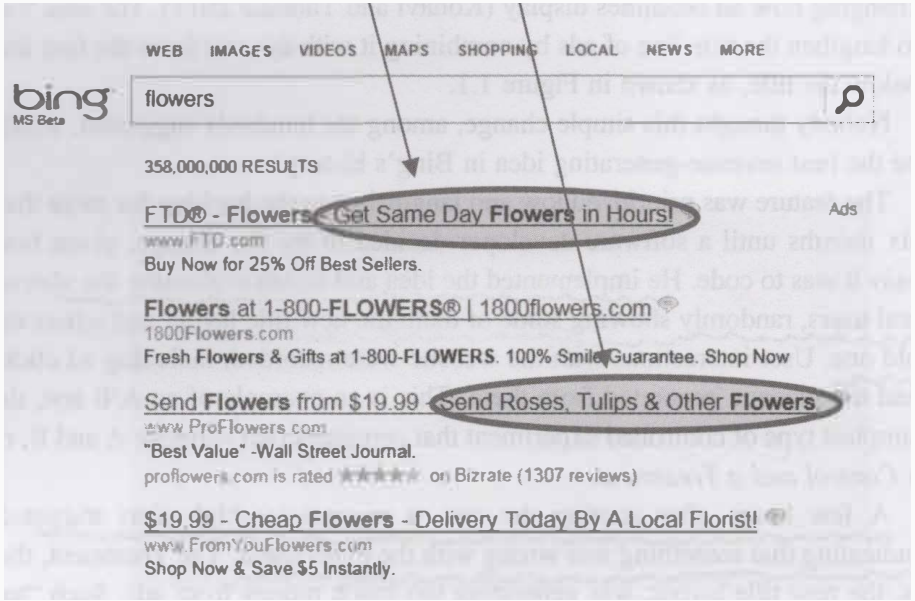

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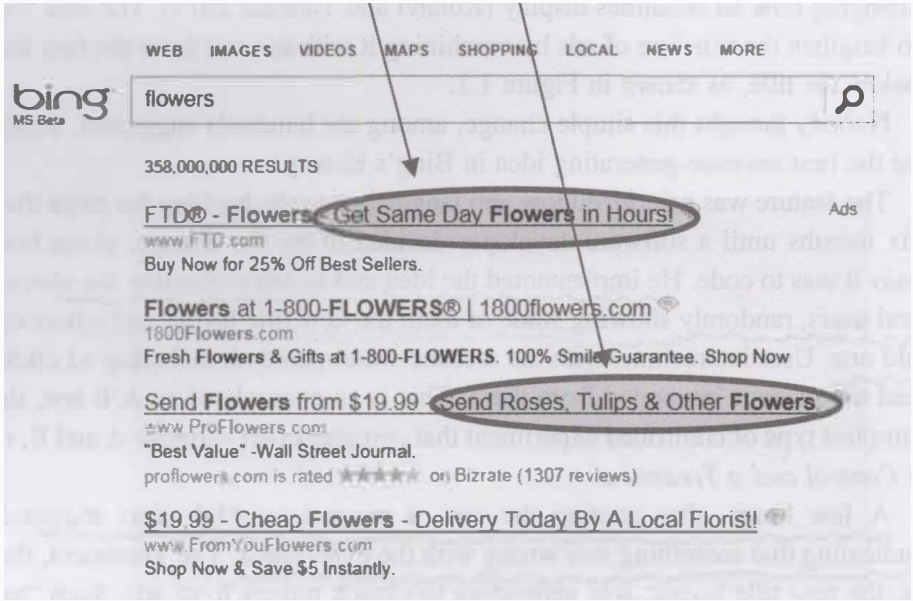

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- Likely empirically relevant, short answer: **steering often lowers consumer welfare**, in some cases severely so.
  - This is the case if steering is strong and mistake-based.
  - Then, it induces many welfare-decreasing purchases.

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- Overarching conclusion: firms have limited incentive to educate, and (w/ competition) quite an incentive to obfuscate.

Limited Incentive to Educate

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    - Yes: then, can charge $c + c_a/2$, making positive profits.

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- So far, we have talked about education – enlightening consumers about prices.
- Natural opposite is confusing – making it harder to appreciate prices.
- Creating confusion might be easier than educating.
  - But overall we know very little about “technology” of education and obfuscation.
  - And about the dynamics of learning and exploitation.

Example: Clear Disclosure

deHaan et al. (2021)

Investment Objective

The fund's goal is to track the total return of the S&P 500® Index.

Fund Fees and Expenses

This table describes the fees and expenses you may pay if you buy and hold shares of the fund. This table does not reflect any brokerage fees or commissions you may incur when buying or selling fund shares.

Shareholder Fees (fees paid directly from your investment)	
	None
Annual Fund Operating Expenses (expenses that you pay each year as a % of the value of your investment)	
Management fees	0.02
Other expenses	None
Total annual fund operating expenses[1]	**0.02**

[1] The information in the table has been restated to reflect current fees and expenses.

Example

This example is intended to help you compare the cost of investing in the fund with the cost of investing in other funds. The example assumes that you invest $10,000 in the fund for the time periods indicated and then redeem all of your shares at the end of those time periods. The example also assumes that your investment has a 5% return each year and that the fund's operating expenses remain the same. The figures are based on total annual fund operating expenses after any expense reduction. The example does not reflect any brokerage fees or commissions you may incur when buying or selling fund shares. Your actual costs may be higher or lower.

Expenses on a $10,000 Investment

1 Year	3 Years	5 Years	10 Years
$2	$6	$11	$26

Example: Unclear Disclosure

deHaan et al. (2021)

Deutsche S&P 500 Index Fund

INVESTMENT OBJECTIVE

The fund seeks to provide investment results that, before expenses, correspond to the total return of common stocks publicly traded in the United States, as represented by the Standard & Poor's 500 Composite Stock Price Index (S&P 500® Index).

The fund invests for capital appreciation, not income; any dividend and interest income is incidental to the pursuit of its objective.

The fund is a feeder fund that invests substantially all of its assets in a "master portfolio," the Deutsche Equity 500 Index Portfolio (the "Portfolio"), which will invest directly in securities and other instruments. The Portfolio has the same investment objective and strategies as the fund. References to investments by the fund may refer to actions undertaken by the Portfolio.

FEES AND EXPENSES OF THE FUND

These are the fees and expenses you may pay when you buy and hold shares. You may qualify for sales charge discounts if you and your immediate family invest, or agree to invest in the future, at least $100,000 in Class A shares in Deutsche funds or if you invest at least $250,000 in Class T shares in the fund. More information about these and other discounts and waivers is available from your financial advisor and in Choosing a Share Class (p. 34), Sales Charge Waivers and Discounts Available Through Intermediaries (Appendix B, p. 74) and Purchase and Redemption of Shares in the fund's Statement of Additional Information (SAI) (p. II-16).

SHAREHOLDER FEES (paid directly from your investment)

	A	T	C	R6	S
Maximum sales charge (load) imposed on purchases, as % of offering price	4.50	2.50	None	None	None
Maximum deferred sales charge (load), as % of redemption proceeds	None	None	1.00	None	None
Account Maintenance Fee (annually, for fund account balances below $10,000 and subject to certain exceptions)	$20	None	$20	None	$20

ANNUAL FUND OPERATING EXPENSES

(expenses that you pay each year as a % of the value of your investment)

	A	T	C	R6	S
Management fee	0.05	0.05	0.05	0.05	0.05
Distribution/service (12b-1) fees	0.24	0.25	0.99	None	None
Other expenses[1]	0.30	0.30	0.26	0.35	0.29
Total annual fund operating expenses[2]	0.59	0.60	1.30	0.40	0.34
Fee waiver/expense reimbursement	0.00	0.00	0.00	0.05	0.00
Total annual fund operating expenses after fee waiver/expense reimbursement	0.59	0.60	1.30	0.35	0.34

[1] "Other expenses" for Class T are based on estimated amounts for the current fiscal year.

[2]The table and Example below reflect the expenses of both the fund and the Portfolio.

The Advisor has contractually agreed through April 30, 2019 to waive its fees and/or reimburse fund expenses, including expenses of the Portfolio allocated to the fund, to the extent necessary to maintain the fund's total annual operating expenses (excluding certain expenses such as extraordinary expenses, taxes, brokerage, interest and acquired fund fees and expenses) at a ratio no higher than 0.35% for Class R6. The agreement may only be terminated with the consent of the fund's Board.

EXAMPLE

This Example is intended to help you compare the cost of investing in the fund with the cost of investing in other mutual funds. The Example assumes that you invest $10,000 in the fund for the time periods indicated and then redeem all of your shares at the end of those periods. The Example also assumes that your investment has a 5% return each year and that the fund's operating expenses (including one year of capped expenses in each period for Class R6) remain the same. Although your actual costs may be higher or lower, based on these assumptions your costs would be:

Years	A	T	C	R6	S
1	$ 508	$310	$ 232	$ 36	$ 35
3	631	437	412	123	109
5	764	576	713	219	191
10	1,155	981	1,568	500	431

You would pay the following expenses if you did not redeem your shares:

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- See Spiegler (2016) for a review.

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  - Hence, firms have an incentive to seek mistakes.

Firms' Responses to Loss Aversion

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- Some decisionmaking implications:
  - **First-order risk aversion**: dislike variation in prices / fees.
  - **Comparison effect**: reluctant to pay higher-than-expected price.
  - **Attachment effect**: expecting to buy raises willingness to pay.

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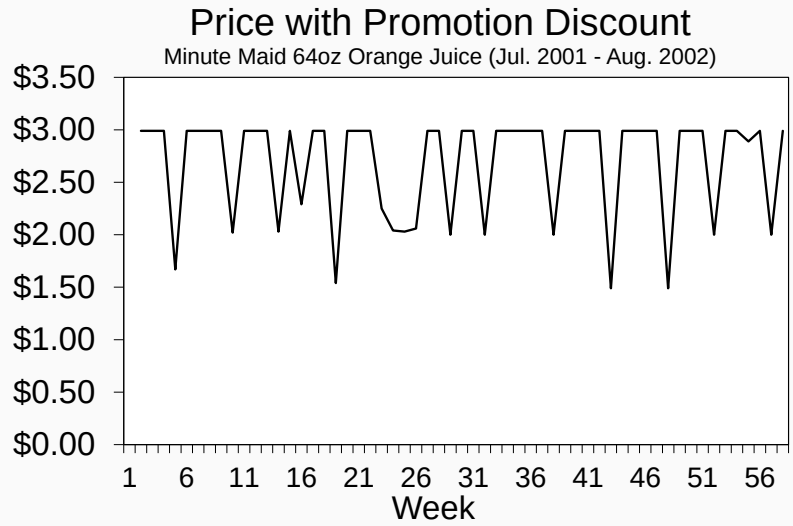

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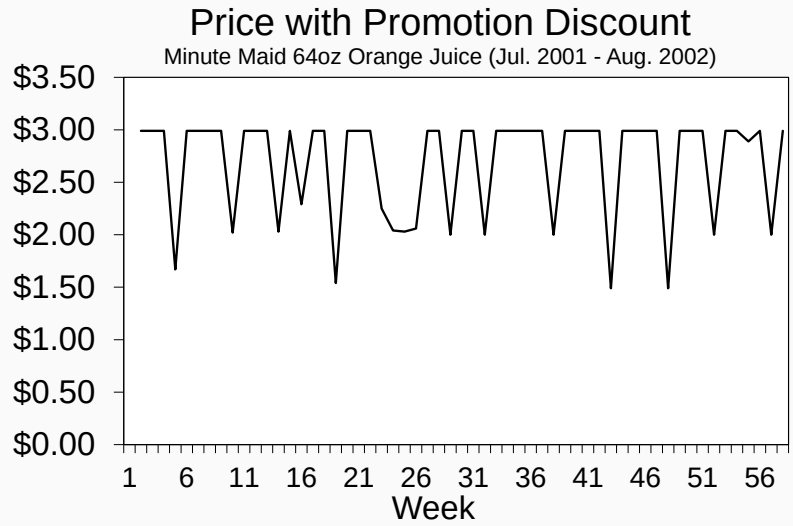

   - Example 2: limited-availability sales (Rosato 2016).

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- Some topics (e.g., consumer data) require more out-of-the-box thinking.