Matthew W. Thomas

Economics Ph.D. Candidate at Northwestern University

Education

Northwestern University

Ph.D. in Economics

2017 – 2023

M.A. in Economics

2017 – 2018

Williams College

B.A. in Mathematics and Economics

2013 – 2017

Publications

Asymmetric All-Pay Auctions with Spillovers (with Maria Betto)

Accepted at *Theoretical Economics*, 2023

What happens when the prize in an all-pay auction depends on players' bids?

PDF

When opposing parties compete for a prize, the sunk effort players exert during the conflict can affect the value of the winner's reward. These *spillovers* can have substantial influence on the equilibrium behavior of participants in applications such as lobbying, warfare, labor tournaments, marketing, and R&D races. To understand this influence, we study a general class of asymmetric, two-player all-pay auctions where we allow for spillovers in each player's reward. The link between participants' efforts and rewards yields novel effects – in particular, players with higher costs and lower values than their opponent sometimes extract larger payoffs.

Working Papers

Regulation of Wages and Hours

How does the determination of labor hours affect optimal regulation?

PDF Slides

This paper studies the problem of a labor market regulator who knows that workers prefer to work fewer hours at their current wage, but lacks specific knowledge of production, labor disutility, and the bargaining protocol. We show that for a large class of bargaining protocols, moderate regulation (such as a small minimum wage) is counterproductive in that it results in hours that exceed the efficient quantity. We find that a combination of the minimum wage, overtime pay, and a cap on hours is optimal in a novel robust regulatory setting where the regulator has neither a prior nor exogenous bounds on model parameters.

Choice over Assessments (with Maria Betto)

When do bad agents prefer bad tests? Can we use this to make tests better?

There are many settings where agents with differing types choose among assessments that attempt to measure these types. For example, students may take either the SAT or ACT. Bond issuers may choose between the three main rating agencies. Assessments that provide higher ratings are obviously preferable to all agents. Preferences over risk are less obvious. Intuitively, low types prefer less accurate assessments because they can benefit more from mistakes. High types prefer more accurate assessments because they benefit from an accurate description of their type. We propose a condition on the assessments that ensures agents will choose them in an assortative manner. If the assessments have only two scores, this condition implies Blackwell's informativeness criterion. However, this does not hold with three or more scores. When the assessments give the same unconditional distribution of scores, our condition implies the concordance order. We extend the analysis to repeated testing and mechanism design. We show that a principal can use menus of garbled assessments to improve the informativeness of high scores.

Anonymous Contest Design

What is the revenue maximizing contest with heterogenous agents?

There are many settings where a principal knows the interim distribution of agent types rather than the ex-ante distribution. For example, the principal may have data that is anonymized or may know the types but is not allowed to discriminate. This setting is rarely studied in mechanism design because the optimal mechanisms are usually trivial. However, this setting is frequently studied in the design of contests under functional form assumptions that preclude full-surplus extraction. We model contest design as a general allocation rule without any functional form assumptions. Instead, we impose efficiency, the requirement that the entire prize budget must be allocated in response to any bid profile. This condition holds in all popular models of contests. We find that efficiency and linearity of payoffs are sufficient to prevent full surplus extraction. In the two-player case, the overall optimal contest is one of two popular models: an all-pay auction with bid caps when heterogeneity is low or a difference-form contest when heterogeneity is high.

Covert Discrimination and Self-promotion

How can biased reports be endogenously corrected?

PDF

Agents with similar skill may differ in their ability to self-promote. We consider the problem of a manager who uses an anonymous contest to extract effort from equally productive workers who differ in their ability to win the contest. In this setting, the manager would like to offer a larger prize to the weaker worker to increase competitiveness. However, this overt discrimination is forbidden by anonymity. Instead, the designer is limited to contests with *covert* discrimination: those which give the weaker player a larger prize only in equilibrium. If the prize is fixed, it is often possible to engage in covert discrimination against the stronger player to increase total output. However, full surplus extraction is not typically possible. So, the stronger player is better off than the weaker player despite the smaller prize. If the designer can endogenize the prize, full surplus extraction is possible in an all-pay auction as long as a single-crossing condition is met.

Free-Riding and Herding in OTC Markets (with Maria Betto)

Why do we see more herding in sales than buys in bond markets?

Corporate bonds are traded in decentralized over-the-counter (OTC) markets which provide slower dissemination of information than equity markets. This causes players to “herd”, i.e., copy the purchase and sale actions of other players. We build a stylized model of a market leader and follower to explain two empirical facts: herding is more prevalent in (1) more liquid markets and (2) in sales than in buys. In our model, herding is more prevalent in liquid markets because the leader changes the market price less when taking action. Because this change is always detrimental for the follower, increased liquidity reduces the cost of waiting for the leader’s action. Herding is more prevalent in sales than buys because it is difficult to short sell in OTC markets. Therefore, any player who sells bought the asset in a previous period. When the leader buys, it reveals that it received a buy signal over a certain threshold. When the leader sells, it demonstrates both that the leader received a strong sell signal and that the original buy signal was not that strong.

Presentations

Rochester Institute of Technology, Simon Business School, University of Illinois Urbana-Champaign, Federal Trade Commission, Kellogg School of Management, Northwestern University, Conference on "Contests: Theory and Evidence"

Refereeing

American Economic Review, Economics Letters, Journal of Mathematical Economics, Journal of Open Source Software, Journal of Public Economic Theory, Review of Economic Design

Fellowships & Awards

Dissertation Fellowship, Northwestern University

2022

Graduate Fellowship, Northwestern University
2017
Phi Beta Kappa, Williams College
2017
Maxima Cum Laude, Williams College
2017
Carl Van Duyne Prize in Economics, Williams College
2016
Sentinels Fellowship, Williams College
2015

Research Experience

Research Assistant, Ivan A. Canay, Northwestern University
2021 – 2023
Research Assistant, Center for Economic Theory, Northwestern University
2020 – 2021
Research Assistant, Matthew Gibson, Williams College
2015 – 2016

Software

Research Software Packages

Integral Equations (inteq)
Python package to numerically solve common integral equations
Source

All-Pay Auctions in Python (allpy)
Python package to estimate the equilibria of all-pay auctions with spillovers
Source

Approximate Randomization Tests in R (rART)
R package for Approximate Randomization Tests with a Small Number of Clusters

Source

Other Software & Projects

ActivityPub Follow

Public follow service for ActivityPub

Source

Crowdmark Labeler

Python package I made as a TA to add student names to Crowdmark PDFs

Source

Econ Ipsum

Generate academic-sounding filler text

Source

Hash Viewer

Share math and text without storing it

Source

Jekyll Citations

Ruby gem I made as an RA to generate bibliographies in Jekyll

Source

Kellogg R Workshop Slides

Slides I made for MBA workshops on R

Source

MWT's Mirrors

Mirrors for open source software

MWT's Share

Send files and shorten links

Source

MathJaX Bookmarklet

Display math on any webpage

Source

certbot-dns-bunny

Certbot plugin for BunnyDNS

Source

vTeX

Mini LaTeX/pandoc bundle for CI

Source

References

Asher Wolinsky

Professor at Northwestern University

Contact

Wojciech Olszewski

Professor at Northwestern University

Contact

Bruno Strulovici

Professor at Northwestern University

Contact