NBER Digital Economics and AI Tutorial — Application

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1. Contact Information

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2. Graduate Study

I entered the Ph.D. program in Economics at the University of Virginia in August 2023 and am in my fourth year (2026–27). I completed the first- and second-year coursework, which covers the core sequence in microeconomic theory, macroeconomics, and econometrics and field courses in Industrial Organization, and advanced to candidacy in April 2026. My main field is industrial organization.

3. Research Interests

I study how firms consolidate fragmented markets, and what consolidation does to prices, product variety, and market power. My tools are dynamic structural models of sequential acquisitions, estimated on ownership and price data that I assemble from administrative registries and the web. Digital markets make these questions sharper and more measurable: a platform sets the fees and runs the ranking algorithm that every seller faces, prices and seller identities are recorded daily, and acquisitions of small online brands fall far below merger-review thresholds. I am also interested in using machine learning and large language models to build such datasets, in particular for record linkage across sources that do not share identifiers.

4. Dissertation

Title: The Consolidation of Digital Commerce: Evidence from Private Equity Roll-ups on Amazon
Committee: Federico Ciliberto, Alexander MacKay, Simon Anderson
Description. The dissertation studies how acquisitions consolidate fragmented markets, and what consolidation does to prices, product variety, and productivity. The first chapter studies PE- and VC-backed "Amazon aggregators" that rolled up third-party brands and then consolidated with each other (Section 5.1). The second chapter builds and estimates a dynamic acquisition model for private-equity (PE) roll-ups in retail gasoline, where a sponsor buys a platform firm and then adds many small targets, each too small to trigger antitrust review (Section 5.2); its framework carries over to the first chapter. The third chapter studies acquisition-based entry and rising concentration among U.S. homebuilders (Section 5.3).

5. Projects in Progress

5.1 The Consolidation of Digital Commerce: Private Equity Roll-ups on Amazon (early stage)

Setting. Third-party sellers using Fulfillment by Amazon (FBA) are mostly small brands, often one product line run by one or two people. From 2020, aggregators such as Thrasio, Perch, Razor Group, and SellerX raised capital to buy such brands at scale: Marketplace Pulse counts over $12 billion raised in 2021 alone and over $16 billion in total, equity and debt combined.[1] When interest rates rose, the strategy reversed. Thrasio, which had raised $3.4 billion, filed for Chapter 11 on February 28,

[1] Marketplace Pulse, "Amazon Aggregators Raised Over $12 Billion in 2021" (December 9, 2021) and its aggregator tracker (`https://www.marketplacepulse.com/aggregators`).

2024, with more than 200 affiliated debtors.[2] The surviving firms merged: SellerX agreed to acquire Elevate Brands in an all-share deal (May 2023), and Razor Group acquired Perch in an all-stock deal (March 2024).[3] The market thus shows a full roll-up cycle within five years: platform entry, serial add-on acquisitions, financing shocks, distressed exits, and a consolidation of consolidators.

Questions.

(i) *Where does the roll-up value come from?* Candidate sources are operating scale (sourcing, logistics, advertising), pricing power when one owner holds several substitute brands in the same niche, and platform-specific advantages such as search ranking. These have different welfare implications.

(ii) *What happens to prices, variety, and quality after acquisition?* I compare acquired brands with similar unacquired brands in the same product niche, and study the second wave of mergers, which joins portfolios that may overlap within niches.

(iii) *How do financing conditions drive roll-ups?* The 2022–23 rate increases changed the cost of acquisition while consumer demand on the platform did not change in the same way. This variation helps separate the cost of acquiring from the value of owning. Distressed sales and bankruptcy divestitures also reveal exit values, which are rarely observed for PE roll-ups.

Data (in construction). Acquisitions can be dated from public USPTO trademark assignment records: many FBA brands hold a U.S. trademark to enroll in Amazon Brand Registry, and a sale transfers it to an acquisition vehicle with a recognizable name (e.g., "Thrasio Eighteen, Inc.", "Perch Acquisition Co. 7 LLC"). Thrasio's bankruptcy filings list its subsidiaries, and archived portfolio pages list brands. I will link brands to Amazon product identifiers (ASINs) and track daily prices, sales ranks, review counts, and the seller holding the Buy Box through the Keepa API. A change of seller on an unchanged product cross-checks the trademark date. Linking trademark owners, seller names, and brand names across sources with no common identifier is a record-linkage problem where I plan to use language-model-based entity matching, with hand-labeled validation samples.

Approach. The structural model from my gasoline chapter transfers directly. A consolidator meets independent sellers as they come up for sale and buys or passes. The local market becomes a product niche instead of a geographic area. Demand within a niche is a nested logit with the platform's fees and ranking as part of the environment. Each aggregator is active in many niches, and many aggregators exited or merged; both many markets per firm and observed exits are scarce in the gasoline setting. I would value feedback at the tutorial on modeling the platform side (fees, ranking, Amazon's own first-party products), on mapping sales ranks to quantities, and on the use of AI tools for data construction.

5.2 Penetrating Regionally Fragmented Markets: PE Roll-ups in Retail Gasoline

PE platforms enter Texas retail gasoline through multi-market package deals, and local consolidation then proceeds one station at a time. I build a dynamic consolidator–fringe acquisition model in which a consolidator meets independent stations as they come up for sale and buys at the seller's take-it-or-leave-it reservation value or lets the station pass to another independent. With one consolidator, the buy-or-pass choice satisfies an exact one-period estimating equation that is linear in the scaled payoff parameters, needs neither transaction prices nor an equilibrium solution, and isolates the target's expected gain from further consolidation as an explicit merger-externality term. On the data side, I reconstructed the station-level ownership history of Texas from the state's tank registry and archived snapshots, which recovers sales between independents that the current registry overwrites, and estimated a route-based spatial demand model for gasoline.

[2] CNBC, February 28, 2024; Chapter 11 case in the U.S. Bankruptcy Court for the District of New Jersey.
[3] TechCrunch, May 31, 2023; Bloomberg, March 4, 2024.

5.3 Growth Without Productivity: Market Concentration in U.S. Residential Construction

The top ten builders' share of new single-family homes rose from under 9 percent in 1989 to 44.7 percent in 2024, while construction productivity stagnated. I develop a dynamic model of competition between national and local homebuilders in which acquisition-based entry under land-use regulation drives concentration without productivity gains: regulation raises the cost of de novo entry but not of acquisition, accumulated market share lowers costs through bargaining power over subcontractors and lenders, and expansion by acquisition crowds out productivity-enhancing investment. In nationwide deed microdata on 9.9 million new-construction sales, the top-ten share rises from 15.7 percent in 2010 to 40.9 percent in 2024, and the mean top-ten share within county markets reaches 77.5 percent. I propose a two-stage estimator following Bajari, Benkard, and Levin (2007).

5.4 Other Project

Who Is Paid for the Pill? Drug Approvals and Executive Pay (with Gaurab Aryal and Federico Ciliberto). A new panel of executive pay built from SEC proxy statements, linked to the estimated value of drug approvals.