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研究課題名(和文) Novel approaches to analysis of welfare impact of industrial policies

研究課題名(英文) Novel approaches to analysis of welfare impact of industrial policies

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研究成果の概要(和文)：本研究は、既存研究では明らかになっていない需要・供給曲線の現実的な性質を解析している。ITコストの削減が進むにつれ、高精度なビッグデータを入手することが可能になった。このため、需要・供給曲線の性質に基づいた様々な理論モデルの予測と、最新の実証研究の結果とを照合する必要性が重要になってきた。本研究は、一般的な需要関数と費用曲線に纏わる経済均衡を分析するための、斬新かつ適応性のある手法を取り入れている。また、従来の研究結果を広範囲に応用できる形にすることで、技術や検証費用等の変化による徴税コストの変化の分析に役に立つ。更に、企業の価格差別が社会にどのような影響を及ぼしているかを明確にしている。

研究成果の概要(英文)：This project investigates the implications of realistic properties of demand and supply curves that have not been previously studied due to a lack of empirical data. As larger and more detailed datasets are becoming available due to falling costs of information technology, it becomes crucial to understand the predictions of economic models that incorporate the shapes of demand and supply curves consistent with new empirical findings. The research involves (1) a novel, flexible approach to analyzing economic equilibria involving generic demand curves and cost curves, (2), a generalization of previous results to a very general specification of taxes, which may involve technological or verification cost associated with tax collection, (3) an investigation of the social impact of price discrimination by firms.

研究分野：Industrial organization, international trade

キーワード：租税負担 為替レート パススルー ミクロ経済学

1. 研究開始当初の背景

This project investigates the implications of realistic properties of demand and supply curves that have not been previously studied due to a lack of empirical data. As larger and more detailed datasets are becoming available due to falling costs of information technology, it becomes crucial to understand the predictions of economic models that incorporate the shapes of demand and supply curves consistent with new empirical findings.

The paper "Pass-Through as an Economic Tool: Principles of Incidence under Imperfect Competition" (*Journal of Political Economy* 121 (3), 528-583), in collaboration with Glen Weyl, introduced a new point of view on market competition and its interaction with demand and supply curves of different shapes. It clarified the role of different economic forces and led to simpler computation. For this reason, its results have been used in numerous empirical studies.

The present project complements those results with explicit analytic solution methods and computational methods and provides a substantial generalization of those results. In addition, it investigates applications to the special case of price discrimination.

2. 研究の目的

When the "Pass-Through as an Economic Tool" paper was completed, it became clear that in many situations, economists would benefit from having an analytic way of

finding explicit analytic solutions to economic models that relax highly restrictive assumption on demand and supply curves that are typically imposed without any empirical motivation. Paper 1 of this project provides such framework that leads to analytic solutions. These analytic solutions may be used either in analytic investigations or to speed up large-scale numerical computations.

Further, the "Pass-Through as an Economic Tool" paper focused on additive changes to marginal costs or specific (per-unit) taxes. It was not clear how to generalize its results to situations with more complicated changes to firms' cost structure. Paper 2 of this project provides an elegant answer to this question. We show that similarly succinct formulas describe the behavior of markets in under much more general policy changes or technological changes.

Finally, the "Pass-Through as an Economic Tool" paper briefly discussed applications to (third-degree) price discrimination by firms. Paper 3 provides a generalization and expansion of that approach to welfare analysis of price discrimination.

3. 研究の方法

The research combines three approaches to economic analysis: (a) analytic methods for finding exact solutions to economic models, (b) numerical modeling and (c) empirical investigations. Our analytic analysis is aided by symbolic manipulation software. For numerical analysis, we use high-performance GPU computing. Our empirical analysis utilizes firm-level data

on international trade.

4. 研究成果

Paper 1: "The Average-Marginal Relationship and Tractable Equilibrium Forms", Michal Fabinger and E. Glen Weyl

<https://arxiv.org/abs/1611.02270>

This paper starts with the observation that familiar functional forms (such as constant elasticity or linear) leading to tractable economic models satisfy a relationship that closely ties their average and marginal versions and that this relationship allows for closed-form solutions to economic models. In the paper, we explicitly characterize equilibrium systems obeying a generalization of these properties, showing they form a hierarchy of tractable models. The resulting functional forms are more realistic but highly tractable. We find that these forms have importantly different implications for policy analysis, and we illustrate that with applications from innovation, industrial, international, auction and public economics.

Paper 2: "Multi-Dimensional Pass-Through, Incidence, and the Welfare Burden of Taxation in Oligopoly", Takanori Adachi and Michal Fabinger

https://papers.ssrn.com/abstract_id=291985
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This paper studies welfare consequences of unit and ad valorem taxes in oligopoly with general demand, non-constant marginal costs, and a generalized type of competition.

We present formulas providing connections between marginal cost of public funds, tax incidence, unit tax pass-through, ad valorem tax pass-through, and other economic quantities of interest. First, in the case of symmetric firms, we show that there exists a simple, empirically relevant set of sufficient statistics for the marginal cost of public funds, namely the pass-through and the industry demand elasticity.

Specializing to the case of price or quantity competition, we show how marginal cost of public funds and pass-through are expressed using elasticities and curvatures of demand and inverse demand. Second, we present a generalization with the tax revenue function specified as a general function parameterized by a vector of tax parameters. We analyze multidimensional pass-through and show that it is crucial for evaluating welfare changes in response to changes in taxation. Finally, we argue that our results are carried over to the case of heterogeneous firms and other extensions.

Paper 3: "Output and Welfare Implications of Oligopolistic Third-Degree Price Discrimination", Takanori Adachi and Michal Fabinger

https://papers.ssrn.com/abstract_id=300642
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In many realistic settings, the market structure is oligopoly and firms face different costs of serving different groups of consumers. Yet the question of whether or not price discrimination increases welfare in these cases has not been sufficiently explored in the literature. We investigate

this question and derive theorems that characterize the conditions under which price discrimination is optimal from the social perspective and conditions under which it is better for the government to introduce legislation that eliminates price discrimination.

More concretely, using estimable concepts, we provide sufficient conditions for price discrimination to lower or raise aggregate output and social welfare under symmetrically differentiated oligopoly with general demand functions and cost differences across separated markets. Assuming that all markets are open under uniform pricing, we show that if the markup ratio in the strong market (where the discriminatory price is higher than the uniform price) relative to the weak market (where it is lower) is sufficiently large under uniform pricing, then social welfare will be lower if price discrimination is allowed. It is also shown that if either the conduct ratio, the pass-through ratio, or the markup ratio is sufficiently small in the strong market under price discrimination, then it raises social welfare.

5. 主な発表論文等
(研究代表者、研究分担者及び連携研究者には下線)

[学会発表] (計 8 件)

1. The Average-Marginal Relationship and Tractable Equilibrium Forms, Michal Fabinger, Japan Society for International Economics Meeting, Tokyo, October 22, 2017

2. Multi-Dimensional Pass-Through,

Incidence, and the Welfare Burden of Taxation in Oligopoly, Michal Fabinger, International Association for Applied Econometrics Conference, Sapporo, June 28, 2017

3. Multi-Dimensional Pass-Through, Incidence, and the Welfare Burden of Taxation in Oligopoly, Michal Fabinger, Japanese Economic Association Meeting, Kyoto, June 24, 2017

4. Multi-Dimensional Pass-Through, Incidence, and the Welfare Burden of Taxation in Oligopoly, Michal Fabinger, Asia Pacific Trade Seminars, Hanoi, Vietnam, June 17, 2017

5. A Tractable Approach to Pass-Through Patterns, Society for Economic Dynamics Meeting, Michal Fabinger, Warsaw, Poland, June 25, 2015

6. Solving Problems in Economics Using Methods of Mathematical Physics, Michal Fabinger, Complex Systems Workshop, Prague, Czech Republic, June 24, 2015

7. A Tractable Approach to Pass-Through Patterns, Michal Fabinger, Australasian Trade Workshop, Sydney, Australia, April 8, 2015

8. A Tractable Approach to Pass-Through Patterns with Applications to International Trade, Michal Fabinger, Japanese Economic Association Meeting, Fukuoka, October 12, 2014

6. 研究組織

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