

Collusion and distribution of profits under differential information*

Konstantinos Serfes¹ and Nicholas C. Yannelis²

¹ Department of Economics, SUNY at Stony Brook, Stony Brook, NY 11794-4384, U.S.A

² Department of Economics, University of Illinois at Urbana-Champaign, 330 Commerce West Building, 1206 South Sixth Street, Champaign, IL 61820, U.S.A

Abstract. We examine a Cournot game with differential private information. We study collusion under different information rules, i.e., when firms pool their private information, use their common knowledge information, or decide not to share their private information at all. We put the industry profits under the three different information schemes in a hierarchy. In addition, we look at the incentive compatibility problem and we show that only collusion under common knowledge information is incentive compatible. Finally, we deal with the issue of how the industry profits are distributed among the firms, in a way that asymmetries are captured. We propose the *Shapley value* as a proper way to distribute the industry profits among the firms. We also point out that the α -core associated with the Cournot game with differential information is non-empty.

JEL Classification Number: C71, C72, D82

Keywords: Collusion, differential information, Shapley value, *alpha*-core

1 Introduction

We study the collusion of firms with differential information. A game with differential information consists of a finite number of firms, where each firm is characterized by its strategy set, its payoff function, its private information (which is a partition of an exogeneously given probability measure space) and a prior. When firms collude, they choose an output level that maximizes joint expected profits. The information firms can use in the collusive agreement varies. Firms may pool their information, may use their private information, or they may choose to use their common knowledge information. Each type of information sharing yields different profits and most importantly creates different incentives to the individual firms for

*The paper benefited from discussions with Jingang Zhao.