

# Essays on Coalition Formation Theory

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# Valorization Addendum

This addendum discusses the *knowledge valorization* generated by the chapters of the dissertation.

According to the report of the National Valorization Committee,

"knowledge valorization means the process of creating value from knowledge, by making knowledge suitable and/or available for social (and/or economic) use and by making it suitable for translation into competing products, services, processes and new activities."

Examples of social (and/or economic) value creation from research results can be very different from each other depending on the disciplines: licences, open source tools, software, co-publications with social and/or economic stakeholders, publications in journals and newspapers, non-academic publications, appearances in the media, contributions to public debates, advice for social organisations or companies, policy advice for governments and training programmes for professionals.

Of the item listed above, the only one that is directly applicable to the present work is "publications in journals". The paper based upon Chapter 2 was published at *Econometrica* in 2019. The paper based upon Chapter 3 was published at *Theory and Decision* in 2019. The paper based upon Chapter 4 has been submitted to an A journal. However, given the theoretical nature of the dissertation, other opportunities of valorization are merely speculative. Theory is, by its nature, abstract and provides a selective and one-sided account of the many-sided concrete social world.

Theory and research are strongly interrelated. For example, theory enables us to connect a single study to the immense base of knowledge to which other researchers contribute. The framework and results contained in Chapter 2 are exactly in this spirit: at first glance, indeed, literature on coalition formation theory seems particularly fragmented: coalition formation theory belongs to cooperative game theory as well as to non-cooperative game theory. Furthermore, a coalition formation process can be studied by exploiting a variety of settings and solution concepts. In Chapter 2, we provide a new tool which unifies and generalizes different previous results in this area of research. The most interesting feature of this new tool concerns its capability of providing a prediction even in those scenarios where standard tools fail. An example is given by Chapter 3 which studies a Bertrand duopoly with different costs. It is well known that if prices can be any real number a solution in pure strategies does not exist. Despite the popularity of Bertrand duopoly, the set of mixed-strategies Nash equilibria has not been fully characterized, but, infinitely many equilibria exist. We obtain a unique prediction both when predatory pricing is allowed and when it is forbidden by law. An implication of our results is that when

predatory pricing is forbidden, the market price is predicted to be weakly lower than in mixed strategies Nash equilibria.

Chapter 4 is in line with a rising literature in coalition formation theory which studies how social norm and behavioural preferences can affect democratic institutions. In particular we study coalition formation among heterogeneous individuals who care not only about their absolute economic gain but also about their relative economic position within the group they belong to. We consider competitive societies in which the surplus of a coalition is split according to productivity and egalitarian societies in which coalitions split their surplus equally. Both competitive and egalitarian societies lead to segregated partition structures. For competitive societies, all stable allocations are based on bottom-up segregation, i.e., individuals with adjacent productivities form coalitions and if some individuals are not part of a productive coalition, then these are the most productive ones. For egalitarian societies, we obtain top-down segregation in all stable allocations. Again it holds that individuals with adjacent productivities form coalitions, but now the least productive individuals may not be part of any productive coalition. In both societies, if an allocation is not segregated then there exists a sequence of coalitional deviations which lead to a segregated allocation.

However, despite all my effort to extract a social or economic value from these results, I cannot really foresee the direct and indirect implications for the society. In my defence, I would like to conclude this *valorization addendum* borrowing the words of John von Neumann, one of the greatest scientists of all times:

*"A large part of mathematics which becomes useful developed with absolutely no desire to be useful, and in a situation where nobody could possibly know in what area it would become useful; and there were no general indications that it ever would be so."*