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resale markets

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Abstract

Resale markets are necessary to correct misallocations of assets, but do they always ensure that goods end up in the hands of those who value them most? This article reviews theoretical arguments as to why this need not necessarily be so and when inefficiencies might be expected despite the presence of resale markets. Policy implications are also suggested.

Keywords

Akerlof, G.; allocative externalities; asymmetric information; auctions; bargaining; Chicago School; Coase Theorem; commitment; efficient allocation; incentive constraints; interdependent values; limited liability; market failure; market imperfections; mechanism design; participation constraints; private information; property rights allocation; resale markets; reservation utility; revelation principle; risk aversion; transferability

Article

Resale markets seem necessary to correct misallocations of assets, where misallocations may be the result of mistakes in initial purchasing decisions, or more generally of changes in the state of the economy. For the sake of illustration, a car owner may after a while find it desirable to buy a new car, and he may be willing to resell his old car on the second-hand market. A manager of a firm holding a Universal Mobile Telephone System (UMTS) licence may be willing to resell her licence to another firm if she realizes that the firm is unable to cover its cost (generated by the licence acquisition). A homeowner may need to resell his house if he has to move to another country or jurisdiction.

A question of primary interest is whether such resale markets are good for the economy. Or, to put it differently, whether, when and how should such resale markets be regulated? This article starts with the *laissez-faire* viewpoint on this issue; it then proceeds to show how asymmetric information and commitment issues mitigate that viewpoint.

The *laissez-faire* viewpoint

The classical neoliberal viewpoint as represented by the Chicago School would favour *laissez-faire*. Within the present context, this would imply that resale markets should not be regulated. The premise of this line of thought is that resale markets give the right flexibility so that assets can be allocated to the right agents at any point in time. This view has important consequences for the theory of mechanism and market design. Indeed, it implies that the initial allocation of property rights is irrelevant, as resale markets should be able to correct any misallocations (this is one version of the so-called Coase Theorem – Coase, 1960). Thus, according to this view, a government interested in maximizing economic efficiency should worry neither about the method of privatization nor about how to allocate licences for operating public services. It should simply allow for well-functioning resale markets.

Of course, very few economists truly believe that real resale markets can achieve such a fantastic job of always allocating assets to the right agents at the right time. On the academic side, Akerlof (1970) provides an early theoretical example of market failure in the context of the market for used cars (more on this below). Coase himself argues that transaction costs which are numerous are likely to invalidate the above angelic view about resale markets. On the ‘real world’ side, it seems implausible that the method of privatization or the allocation of licences for the use of public services is irrelevant for economic efficiency. In fact, recent years have seen a rapid growth of auction methods to allocate licences or privatize publicly owned firms, suggesting an interest on the part of practitioners in market design. It is worth pointing out that, in the case of licence auctions, most governments have chosen not to allow for resale markets, suggesting some distrust towards their functioning.

In the tradition of Coase, the words ‘transaction costs’ will be interpreted to mean any reason why inefficiencies may arise in transactions. Of course, some of the reasons need not be related to the intuitive notion of transaction costs, and one could alternatively use the more neutral terminology of ‘market imperfections’. The rest of this article will review how theoretical insights from the mechanism design literature and the bargaining literature help identify significant sources of transaction costs. The review will abstract from transferability issues, which is a legitimate idealization for transactions that are not too big for the financial capabilities of the parties. The theoretical insights will then be used to shed some light on whether and how to regulate resale markets.

The role of private information

It is relatively intuitive to see why private information may be a source of inefficiency in transactions. A seller who privately knows her valuation for the object for sale has an incentive to pretend that she values the object more than she really does, in the hope that this will lead the buyer to increase his purchasing price. Similarly, a buyer has an incentive to pretend that he values the good less than he really does, in the hope that he will obtain a lower selling price. But such distortions inevitably induce inefficiencies whenever the gains of trade are not large enough. This intuition has been formalized in the work of Myerson and Satterthwaite (1983), who show that, if the distributions of valuations are independently distributed between a seller and a buyer, and if it is not known who values the good more, inefficiencies must arise in any bargaining game in which no outside money is given to the bargaining parties. One of the strengths of Myerson and Satterthwaite's work is that it applies to any bargaining game, including

protocols in which a broker could help improve the bargaining outcome and protocols allowing for several stages of bargaining. The result is obtained by relying on the so-called revelation principle, which allows for the derivation of constraints that should be satisfied in any Nash–Bayes equilibrium of any game (whether static or dynamic): these constraints are the so-called incentive constraints – an agent with valuation v should find his own strategy no worse than the strategy of the same agent with valuation v' – and the participation constraints – an agent should get at least what he could get by staying outside the game. Myerson and Satterthwaite then proceed to show that these constraints together with the constraint that the bargaining parties receive no outside money cannot be simultaneously satisfied unless there are inefficiencies (see Milgrom, 2004, for an exposition of this and other impossibility results).

The above buyer–seller set-up assumes that agents know how valuable the good is to them. This is referred to as a ‘private values set-up’. Akerlof (1970) identifies another source of bargaining inefficiency in set-ups in which the value to the buyer is a function of the information held by the seller – this is sometimes called an informational externality and referred to as an ‘interdependent values set-up’. For example, a seller of a used car may know the quality of his or her car, and the quality of the car obviously affects the valuation of both the seller and the buyer. In an elegant example, in which the buyer is known to value the good α times as much as the seller with $2 > \alpha > 1$ and the quality (identified here with the valuation of the seller) is distributed uniformly on $[0,1]$, Akerlof shows that there can be no trade. The no-trade result arises because a selling price of p would be acceptable to the seller only if the quality is below p , resulting in an average quality of $p/2$. But such an average quality does not justify buying the good at price p for the buyer, as $\alpha p/2 - p < 0$. One of the beauties in Akerlof’s example is that it illustrates that, even in situations in which it is common knowledge that the buyer values the good more than the seller, there is no trade in equilibrium. Even though Akerlof restricts his analysis to special trading mechanisms, the inefficiency he identifies can be shown to arise in any equilibrium of any bargaining game, with the use of the same mechanism design techniques as those of Myerson and Satterthwaite. It also extends (even though not in the extreme form of no trade) to other classes of problems with interdependent values (see Samuelson, 1984).

In the above bargaining set-ups, a specific form of property rights was assumed. Within the same examples, other efficiency conclusions would arise with alternative property right structures, thereby illustrating how the initial allocation of property rights may affect efficiency in the presence of informational asymmetries. Obviously, in Akerlof’s interdependent values example, if the person valuing the good more is initially the owner of the good there is no inefficiency, which thereby offers a simple illustration of this idea. (See Jehiel and Palfrey, 2006, for further elaboration.) In the private values situation considered by Myerson and Satterthwaite, if the two parties are *ex ante* symmetric and initially own 50 per cent shares of the object, a double auction (in which the party quoting the highest price would buy the 50 per cent shares of the other party at a selling price in between the two quoted prices) would result in an efficient allocation of property rights. Cramton, Gibbons and Klemperer (1987) generalize the latter insight by showing that mixed ownership is economically superior in partnership dissolution problems with private values.

The above bargaining inefficiencies implicitly assume that no outside money can be introduced on to the bargaining table. Otherwise, with large enough subsidies, efficiency could be obtained in the above bargaining set-ups, thereby suggesting that an appropriate public intervention may eliminate the inefficiency due to asymmetric information. However, in interdependent values situations in which agents hold multidimensional signals that are independently distributed across agents, Jehiel and Moldovanu (2001) show that the sole incentive constraints make it generically impossible to achieve the first-best allocation no matter how much money is introduced on to the bargaining table. This result is especially relevant in transactions involving several items because then private information is naturally multidimensional. The result then implies that no public intervention can eliminate the bargaining inefficiencies. (A similar conclusion arises even with one-dimensional private information if the single crossing condition is violated; see Maskin, 1992.)

The above results assume that there is no correlation in the private information held by the various agents. Whenever there are correlations, incentive constraints are less severe because the report made by agent i can be used to deter misreports by agent j . The works of Crémer and McLean (1985; 1988) and Johnson, Pratt and Zeckhauser (1990) (see also Myerson, 1981) suggest that inefficiencies can be totally eliminated even under moderate correlations if agents are risk neutral and transfers can be arbitrarily large. However, limited liability and risk aversion (which seem plausible, especially if very large transfers are involved) ensure that the qualitative insights obtained for the case without correlation continue to hold with moderate correlation (see Robert, 1991). Hence, inefficiencies due to asymmetric information continue to hold even in the correlated case, as long as correlation is not too large. (See also Compte and Jehiel, 2006, who argue within Myerson and Satterthwaite’s private values set-up that inefficiencies may arise even with large correlation whenever agents have the option to leave the bargaining table at any time, thereby obtaining their reservation utility.)

As already mentioned, the above inefficiencies hold even if multiple stages of bargaining are allowed, as long as the only inferences of the players come from the equilibrium play of the other parties and not from the release of new hard information (either in an exogenous manner or through endogenous information acquisition). If new information becomes available, the situation is different. Obviously, if the private information held by the various agents become public at some stage, then at this stage bargaining parties with full commitment abilities should be able to implement an efficient agreement. This is because, if inefficiencies were to arise at that stage, a party could propose a Pareto improvement with no further move, keeping the generated surplus for herself: this can be viewed as an application of the Coase Theorem. But, even if one adopts the view that eventually private information becomes publicly available, a critical issue is about how long this takes. If it takes very long, inefficiencies are still likely to be significant because the transitory phase is long. If it does not take long and full commitments are possible, efficiency can be expected.

The role of commitment

The above reported results assume full commitment abilities on the part of the bargaining parties. Another major source of inefficiencies is the limited commitment abilities of the agents. From the viewpoint of mechanism design, the relaxation of commitment abilities of the proposing party (sometimes called Principal) is generally thought of as a bad thing. But one should be cautious here about the criterion used to assess what ‘good’ or ‘bad’ means. Clearly, from the viewpoint of the Principal limited commitment ability is a bad thing because it puts additional constraints on the Principal’s maximization exercise. However, from the viewpoint of society (as measured by social welfare), the conclusion is far from clear. For example, Coase’s conjecture suggests that a monopolist with no commitment ability may end up pricing his good efficiently if consumers are forward-looking (they anticipate the distribution of future prices correctly) and patient enough. In a similar vein, the commitment ability of an auctioneer may allow him to use inefficient reserve prices, which he might be unable to exploit under weaker commitment scenarios. (See McAfee and Vincent, 1997, for a formal approach, and Zheng, 2002, for an optimal auction model in which, even though the seller can commit not to lower his reservation price if there is no interested buyer, buyers can resell the object if they wish.) Clearly, more work is required to understand the pros and the cons of commitment from a mechanism design perspective with non-benevolent principals.

In a number of transactions, the transacting parties impose a cost or benefit on third parties: think of the sale of pollution rights or the sale of technologies through patents in imperfectly competitive markets. From the viewpoint of the transaction, this corresponds to an externality in the sense that the trade between a subset of agents affects the payoffs of other agents (see Jehiel, Moldovanu and Stacchetti, 1996). Abstracting from

informational asymmetries, Jehiel and Moldovanu (1999) in a one-object environment and Gomes and Jehiel (2005) in a general multi-object environment study resale markets in such set-ups with allocative externalities. They establish that the lack of commitment ability may induce long-run inefficiencies in resale markets whenever there are allocative externalities and agents are patient and forward-looking. Furthermore, if we take as given the legal constraints governing how goods can be exchanged, the initial allocation of property rights is shown to have no effect on the long-run properties of the equilibrium pattern of sales in such markets, as long as parties are forward-looking and patient enough. Thus, in such a complete information world, the lack of commitment ability induces inefficiencies in the presence of allocative externalities and at the same time makes it irrelevant how the initial property rights are allocated.

Practical implications

What are the lessons to be drawn from these theoretical observations? What do these results imply for the desirability of resale markets?

A first category of problems concerns those situations in which private information is persistent. Then the above inefficiency results show that in most scenarios, no matter how exchanges are organized, no matter whether or not resales are permitted, and no matter how well resale markets work, inefficiencies are inevitable. In interdependent value situations with multidimensional signals, even subsidies may not be enough to eliminate the inefficiencies.

Full commitments including controls over resales would seem desirable from a mechanism design viewpoint, as long as the proposing parties seek to maximize total welfare. However, with non-benevolent agents there is no reason in general to expect the full commitment scenario to be preferable to weaker commitment scenarios whenever private information is persistent.

A second category of problems concerns those situations with vanishing private information that will be identified with complete information. Then resale markets permit an efficient allocation of goods whenever agents care solely about their own allocation (that is, when there are no externalities). However, when there are allocative externalities in the sense that the allocation of agent i directly influences the well-being of agent j , resale markets do not allow parties with limited commitment abilities to reach an efficient state of the economy. Yet, even when there are allocative externalities, the efficiency of the economy is unaffected by the initial allocation of property rights, suggesting that in such situations the only role for government interventions is through the legal framework, not the allocation of property rights. For example, it may be desirable from this perspective to require by law that the transacting parties compensate those agents suffering from the transaction.

In complete information situations, it would seem that full commitments including controls over resales should improve efficiency. However, that view ignores the reality of a changing environment, which is one of the basic rationales for the existence of resale markets. Because the economy is changing, resale markets are necessary. The complete contracting scenario implicitly assumed by the full commitment idea is impractical in that it might involve agents that are not even present in the economy (think of a future homeowner who may not yet be born and whose future possession already exists). From a practical viewpoint, the main issue is about understanding the effect of the legal framework that governs resale markets on the overall efficiency of the economy. Some insights about how the legal framework might improve the economic performance of resale markets have been suggested above (see the idea of compensating those agents who suffer from the transaction). Admittedly, more work on both the theoretical and empirical sides is required to understand this as well as the additional effect of persistent private information on resale markets.

See Also

- bargaining
- Coase theorem
- efficient allocation
- incentive compatibility
- market failure
- mechanism design

Bibliography

Akerlof, G. 1970. The market for 'lemons': quality uncertainty and the market mechanism. *Quarterly Journal of Economics* 84, 488–500.

Coase, R. 1960. The problem of social cost. *Journal of Law and Economics* 3, 1–44.

Compte, O. and Jehiel, P. 2006. Veto constraint in mechanism design: inefficiency with correlated types. Mimeo. Paris-Jourdan Sciences Economiques and University College London.

Cramton, P., Gibbons, R. and Klemperer, P. 1987. Dissolving a partnership efficiently. *Econometrica* 55, 615–32.

Crémer, J. and McLean, R. 1985. Optimal selling strategies under uncertainty for a discriminating monopolist when demands are interdependent. *Econometrica* 53, 345–62.

Crémer, J. and McLean, R. 1988. Full extraction of the surplus in Bayesian and dominant strategy auctions. *Econometrica* 56, 1247–57.

Gomes, A. and Jehiel, P. 2005. Dynamic processes of social and economic interactions: on the persistence of inefficiencies. *Journal of Political Economy* 113, 626–67.

Jehiel, P. and Moldovanu, B. 1999. Resale markets and the assignment of property rights. *Review of Economic Studies* 66, 971–91.

Jehiel, P. and Moldovanu, B. 2001. Efficient design with interdependent valuations. *Econometrica* 69, 1237–59.

Jehiel, P., Moldovanu, B. and Stacchetti, E. 1996. How (not) to sell nuclear weapons. *American Economic Review* 86, 814–29.

Jehiel, P. and Pauzner, A. 2006. Partnership dissolution with interdependent values. *RAND Journal of Economics* 37 1–22.

- Johnson, S., Pratt, J. and Zeckhauser, R. 1990. Efficiency despite mutually payoff-relevant private information: the finite case. *Econometrica* 58, 873–900.
- McAfee, P. and Vincent, D. 1997. Sequentially optimal auctions. *Games and Economic Behavior* 18, 246–76.
- Maskin, E. 1992. Auctions and privatization. In *Privatization*, ed. H. Siebert. Kiel: Institut für Weltwirtschaften der Universität Kiel.
- Milgrom, P. 2004. *Putting Auction Theory to Work*. Cambridge: Cambridge University Press.
- Myerson, R. 1981. Optimal auction design. *Mathematics of Operations Research* 6, 58–73.
- Myerson, R. and Satterthwaite, M. 1983. Efficient mechanisms for bilateral trading. *Journal of Economic Theory* 28, 265–81.
- Robert, J. 1991. Continuity in auction design. *Journal of Economic Theory* 55, 169–79.
- Samuelson, W. 1984. Bargaining under asymmetric information. *Econometrica* 52, 995–1005.
- Zheng, C. 2002. Optimal auction with resale. *Econometrica* 70, 2197–224.

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