Bilateral Oligopoly: Countervailing Market Power

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Abstract: Malta's economy, minute by any standard, makes for imperfectly competitive market structures. The degree of this competition is quite interesting since many firms, in the wholesale, retail, as well as in other sectors, tend to form part of oligopolistic structures, such as banking, mobile phone service provision, internet service providers, bottled-water manufacturers, insurance, food importers, supermarkets, and new and used car importers. Oligopsony, or the concentration of market power in the hands of a few buyers, may be considered as the other side of the coin. Many studies of oligopsony have focused on retailers who manage to extract prices and conditions from providers or manufacturers that are beneficial to them, but not necessarily to consumers. This paper discusses the degree of oligopoly power and how the firm tends to wield this power. It also discusses the conceptual basis of bilateral oligopoly (oligopoly and oligopsony) and some of its economic and welfare effects.

Keywords: oligopsony, market, economy, oligopoly, buyer

Oligopoly is usually defined as the market structure which is made up of a few firms. Such firms tend to be relatively large in comparison to other firms in more competitive market structures. Oligopsony, on the other hand, is the concentration of market buying power in the hands of a few buyers. Usually, firms in an oligopolistic output market may be operating as oligopsonists in an input market. This has very important ramifications for the behaviour of such firms in upstream and downstream markets. An upstream market may be defined as the market where a firm buys its

supplies while a downstream market is a market where the firm sells its output.

Bilateral oligopoly is the market situation where oligopoly and oligopsony co-exist, that is, a market structure where the supply side is made up of a few sellers and the demand side consisting of a few buyers. Such a market structure implies the possibility of the presence of countervailing market power, referring to the market power that one side of the market develops in reaction to the market power present on the other side.

Much has been written about oligopoly although the market structure still defies attempts at rationalizing it into a unified model. However, there are a number of models, both mainstream and not so mainstream, which manage to shed light on this most complex of market structures, and it is in the light of these models that I will attempt to treat the subject.

First of all, this paper will present the concept of bilateral oligopoly. Secondly, some oligopolistic market structure examples found in Malta are discussed, as well as local bilateral oligopoly possibilities. It is relatively easier to identify oligopolistic structures on the supply side, but it is evidently more difficult to identify and discuss oligopsony.

Thirdly, the existing empirical structure–conduct–performance model is presented as a means to help measure the degree of oligopoly/ oligopsony that may exist in a particular market. An attempt is also made to use the Herfindahl-Hirschman Index of seller concentration and adapt it to measure buyer concentration, and consequently derive a coefficient to measure what I shall refer to as 'distributed market power (DMP)'.

Finally, existing theory will be used to present an integrated bilateral oligopoly model where the possibility of negotiation is introduced together with the possibilities of negotiation in the bilateral oligopolistic process and to pose the question of how beneficial is such a structure with regards to welfare and efficiency.

This paper is mainly based on a generalized review of the more recent documents and papers on bilateral oligopoly and buyer power. Other sources include locally published information on particular industries as well as interviews with local regulators and chosen industry representatives.

Market structures

A useful model of market structures and market power had been provided by Stackelberg as early as 1934. However, the Office of Fair Trading in the UK (1998) adapted this model in its research paper entitled 'The Welfare Consequences of the Exercise of Buyer Power'. The conceptual model has been further adapted to include Monopolistic and Monopsonistic Competition to illustrate the fuller range of market structures.

Table 1 – Market Structures

Demand Side Form (Buyers)	Supply-Side Form (Sellers)			
	(Many) Innumerable	(Many) Numerous	FEW	ONE
(Many) Innumerable	Perfect Competition	Monopsonistic Competition	Oligopoly	Monopoly
(Many) Numerous	Monopsonistic Competition	Bilateral Monopsonistic Competition	Oligopoly/ Monopsonistic Competition	Monopoly/ Monopsonistic Competition
FEW	Oligopsony	Monopsonistic Competition/ Oligopsony	Bilateral Oligopoly	Bilateral Monopoly
ONE	Monopsony	Monopolistic Competition/ Monopsony	Oligopoly/ Monopsony	Bilateral Monopoly

Source: OFT UK

Various theories of oligopoly have been advanced over the years. Cournot equilibrium is in reality the result of reaction functions by the firms involved to the output that the firm believes the other or others will produce. In the Cournot model, the market determines the price. The Bertrand model is based on the choice of price by the firm, where firms in a duopolistic situation competitively bid against each other by lowering prices, but not lower than marginal cost. Quantities then

adjust accordingly. Stackelberg's model included the advantage of the first mover, or of the price leader.

These thinkers on oligopolistic structure have led to the development of oligopoly theory. Although initially they tended to assume that output was homogenous, competition not dynamic, and production free of constraints, these assumptions have been changed in other critical models with the intention of providing clearer understanding of competitive oligopoly, especially in ever-changing times. Game theory has also provided formalization and a more mathematical analysis of oligopoly.

It is not the intention of this paper to go into the different theories of oligopoly, but it is pertinent to illustrate the characteristics of competitive oligopoly. Markets which are concentrated and where few similar firms are present tend to demonstrate a high level of interdependence among themselves; knowledge is not perfect, there is uncertainty, products may or may not be homogenous but are usually differentiated through proliferation, and there tends to be a high degree of non-price competition. Prices of products may be quite similar, especially if there is strong homogeneity of the output and, in many cases, prices tend to be rigid in the wake of certain market changes. It is within this backdrop that the salient features of this paper will be discussed.

Some aspects of industrial structure in Malta

Malta is a very small country with a population of just over 400,000. Markets are therefore objectively small but, given the level of entrepreneurship on the island, markets, ranging from corner hairdressers to the manufacturing of aluminium apertures, enjoy varying degrees of competition. Some markets, such as the electricity market, are monopolized while others are oligopolistic or duopolistic in nature. Examples of oligopolies in Malta include banks, insurance companies, internet-service providers, mobile-service providers, and bottled-water companies. This study shall consider aspects of possible bilateral oligopoly. Data is available for the supply side but oligopsony is difficult to identify.

Mobile telephony

As an example of a functioning competitive oligopoly, where there is no real countervailing market power on the demand side, the mobile telephony sector offers interesting consideration. For example in 2010, the local mobile telephony penetration rate stood at 110.3 per cent. While carrying out this research, five operators provided mobile telephony services: Vodafone, Go Mobile, Melita, Red Touch, and Ping. Below are their respective market shares.

Table 2 – Mobile Telephony Market Shares

Mobile Telephony Market Shares in terms of mobile telephony subscriptions by end 2010	
Vodafone	47.88%
Go Mobile	41.93%
Melita	8.00%
Red Touch	2.03%
Ping	0.16%

Source: Malta Communications Authority (MCA) 2010

The Herfindahl–Hirschman Index (HHI) for mobile telephony in Malta is 4119 which shows a very highly concentrated industry. This level of concentration makes it a subject for regulation. Suffice it to say that the industry started off with one operator, Vodafone, but it was a contestable market and Go Mobile followed. However, the regulator had to step in and forbid Vodafone from lowering prices before Go Mobile's entry. This was an obvious case of limit pricing where the incumbent would have put up an effective barrier to entry.

This market is very difficult to be subjected to oligopsony because buyers in general are too small. Even large customers do not carry much clout, although prices and products may be tailored to particular schemes offered to closed user groups and bundled products. In fact, it is interesting to note that per minute cost of calls is falling in Malta from an overall of 17c in SH 2009 to 13.9c in the second half (SH) of 2010 while number of minutes has risen to 201.2m in SH 2010 from

161.7m in SH 2009, but not as fast as in Europe in general. This appears to be the general trend. That prices have fallen over time is probably owing to regulatory activity such as number portability and open-time windows, and the entry of the third major competitor, but is also suggestive of huge spare capacity in the industry if taken together with the consideration of the extremely high level of mobile penetration.

Supermarkets

Studies that can be carried out to identify bilateral oligopolies in Malta may include supermarket retail chains and the wholesale market where, in the upstream market, wholesalers are few and the number of large supermarkets or supermarket groups are limited. In this case, do supermarkets as the buyers in bulk from wholesalers have market power, and to what extent are price savings passed on to consumers in the downstream market?

On the other hand, can we consider grocers and small self-service outlets as fringe buyers in the upstream market and therefore have no clout in obtaining discounts from wholesalers? Some smaller grocery shops have, in fact, formed a discounter's cooperative to up their power in the market and act as importers, exporters, wholesalers, retailer, distributors, and agents as well as grocers, thus contributing to the bilateral oligopolistic structure.

This is a very interesting development since the buyer group representing the small grocers represents a larger entity, contributing to the creation of a bilateral oligopolistic structure. The setting up of the cooperative to obtain group discounts falls short of an official merger so that in the downstream market where the grocers are the sellers and the final consumers are the buyers, there is still competition. However, each grocer has his own turf, so that in that restricted area, the structure may easily shift into a monopolistically competitive market.

Tourism

In Malta the organization of tours for tourists also provides an interesting study of bilateral oligopoly. Although there are number of tour organizers and transport companies, there are only a few large tour organizers and large transport companies providing coaches. From industry sources, each contract is the result of one-to-one negotiation, although that does not rule out the possibility that transport providers may collude, or that tour organizers may cooperate. However, given the disparate nature of the latter, it is less possible that these do. This is yet another field of possible study.

Health Insurance

Health insurance is offered by few insurance companies and therefore constitutes an oligopoly. In discussions with the industry, it transpires that the industry attempted to cooperate and thus obtain countervailing power. In order to arrive at some sort of standardization of consultant and surgeon fees, the health insurance industry in Malta attempted to negotiate with the medical profession the professional fees that would be charged to the insurance companies. The custom is to charge the patient and the patient then makes the claim to the insurance for reimbursement.

In attempting to create a bilateral oligopoly, however, where the insurers, as potential buyers negotiating with the sellers, that is, the medical profession, a situation would result in agreements on prices and conditions in an upstream market which would then be carried on to the downstream market. This is where customers deal with insurance health service providers. It is not obvious that any benefits that such an agreement would give to the insurance companies will be passed on to their customers in terms of lower premiums or better insurance conditions.

On the other hand, there could be a transfer of welfare from the medical profession to the insurance companies who, already being oligopolists, and colluders in the upstream market could abuse their

position in the downstream market. It appears that the authorities did not permit such overt collusion, not only between suppliers, but between the two sides of the market.

The role of consumer cooperatives

The usual way of controlling market power has been through regulation. On the one hand, if oligopsony creates a situation that is too one-sided, then it stands to reason that oligopsony is regulated, although this is usually not the case. On the other hand, consumers are protected from seller power through regulation. Can consumer cooperatives form the required countervailing power to oligopolistic sellers? Consumer cooperatives can negotiate in favour of consumers and possibly lead to a redistribution of welfare, especially in increasing consumer surplus.

However, there does remain a very valid problem, namely that of the principal-agent problem. Even if, in a consumer cooperative, the beneficiaries are the consumers, cooperatives can take lives of their own and their administrators may seek to maximize their benefits rather than to provide consumers with countervailing power in oligopolistic markets.

Consortia

Consortia may be 'selling consortia' as well as 'buying consortia'. This is a type of cooperative behaviour usually in relation to a specific transaction. Insurance companies, for example, may create a syndicate to offer insurance which they would otherwise not be able to provide. Buying consortia may also be formed. Consortia formations tend to lead to oligopolistic markets and, if there is countervailing market power, this may lead to bilateral oligopoly.

The structure–conduct–performance paradigm

The trend in dealing with imperfectly competitive markets, apart from the background provided above, has been in the development of what is known as industrial economics or industrial organization. Traditional theory explains what happens to market price and quantity, but even as we depart from the model of perfect competition, we are unable, for example, to determine the supply curve of the firm. Add to this price discrimination, barriers to entry, differentiated products, and a multitude of strategies, and such theory becomes incapable of dealing with the problems of explaining imperfectly competitive markets. For example, the model could identify bilateral oligopolistic structure, as shown in Table 3.

Table 3 – S–C–P Model

STRUCTURE – CONDUCT – PERFORMANCE MODEL		
Structure	**Conduct**	**Performance**
Number of sellers	Pricing strategies:	Profitability
Number of buyers	Price differentiation	Growth
Seller concentration	Price discrimination	Survival
Buyer concentration	Product strategies:	Market share
Distributed market power	Product differentiation	Innovation
Degree of homogeneity	Proliferation	Efficiency
of output	Merger activity:	Economies of scale
Barriers to entry	Vertical, horizontal, lateral	Welfare
Barriers to exit	Research and development	Consumer (buyer) surplus
Degree of vertical	Promotional activity	
Integration	Collusive behaviour	
Degree of horizontal	Buyer cooperation	
Integration	Bargaining	
	Seller consortia	

In the 1930s, the structure-conduct-performance model was developed for understanding the relationships among the firm's environment, its behaviour, and the performance both of the firm and of the industry as a whole. The idea is that an industry's competitive,

or less competitive, structure determines the strategies, for example pricing and differentiation, that are open to it and the ensuing results, in terms for example, of profits or efficiency that are attained.

A dynamic element was later added to the model when, in the 1980s, it was suggested that the relationships among structure, conduct, and performance not only flow in one direction but also in the opposite direction. Starting from the industry's structure as a given, firms can, through their conduct, for example mergers, influence the industry's structure and, consequently their own and the industry's performance. This approach may define and describe such situations more precisely.

Since this model may help to analyse bilateral oligopoly, buyers are expected to perform an active part in the market, possibly by cooperating with one other, bargaining with sellers, and the benefits that are derived from this particular conduct in the form of buyer surplus in the form of, for example, discounts.

At this point, it is pertinent to state that this involves mainly an empirical approach. Economists, however, must be careful to retain the discipline that economic theory has given. Einav and Levin stress that the use of economic theory and the search for compelling sources of identifying variation are not enemies.[1] They further declare that, by framing the exercise in terms of a coherent economic model, such a model may then provide a way to think about the operation of the industry and potentially to draw conclusions about policy or general principles.

Countervailing buyer power

Countervailing power is an expression that was coined by Galbraith in his *American Capitalism: The Concept of Countervailing Power*.[2] It refers to the market power that one side of the market develops in reaction to the market power present on the other side. Although the concept of

1   L. Einav and J.D. Levin, 'Empirical Industrial Organisation: A Progress Report', *Journal of Economic Perspectives*, Vol. 24(2), 145–62, Spring 2010.
2   J.K. Galbraith, *American Capitalism, the Concept of Countervailing Power* (Boston, 1952).

countervailing power was quite controversial at the time, and attracted criticism from other economists, it has come back to the limelight in view of the development of large retail chains that use their market power to win more favourable conditions from large and strong suppliers.

Zhiqi Chen defines buyer power as 'the ability of a buyer to reduce the price profitably below a supplier's normal selling price, or more generally the ability to obtain trade terms more favourable than a supplier's normal trade terms'.[3]

Monopsony is the situation where the buying power is in the hands of one buyer, while oligopsony is the case where a few firms can exercise buyer power. Economic literature has covered monopsony and has also started to cover oligopsony more methodically. Bilateral oligopoly has been observed in several markets, but most of them are intermediary markets, where final consumers are not directly involved.

Measurements of concentration

There are a number of measurements of market concentration, with the most common being the Herfindahl-Hirschman Index, or HHI, which measures the size of the firms with regard to the industry as a whole by calculating market shares. The market share of each firm is squared and the resultant values are then added together in order to give proper weighting to larger firms. The HHI may vary between 0, or slightly higher in the case of perfectly competitive markets, and 10,000 for monopolies. The formula for the Herfindahl-Hirschman Index is

$$H = \sum_{i=1}^{N} s_i^2$$

where H is the index, N refers to the number of firms in the market, and s_i refers to the market share of each firm.

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3   Zhiqi Chen, 'Buyer Power: Economic Theory and Antitrust Policy', *Research in Law and Economics, A Journal of Policy*, Vol. 22, 17–40 (UK, 2007).

The US Department of Justice and Federal Trade, in its 'Horizontal Mergers Guidelines' issued in August 2010 generally classify markets into three types. If the HHI is below 1500, then the market is considered to be very competitive and not concentrated. Markets with an HHI index of between 1500 and 2500 are considered to be moderately concentrated, while an HHI over 2500 indicates a highly concentrated market. It is pertinent to point out that changes in the HHI are also very important for the regulator to make judgements on changing concentrations.

Although the HHI is used for measuring concentration, it has to be applied with a certain degree of circumspection. There are a number of problems associated with its interpretation. One problem is the case of the level of substitutability of the output of the firms in the market under consideration. The HHI must assume a degree of homogeneity of the product since, if the products of the different firms are highly differentiated, the HHI will undervalue the degree of concentration.

Another problem that arises is that of segmentation concentration. If the firms service different segments of the market, then once again the HHI will undervalue the degree of monopolistic power.

Akio Matsumoto, Ugo Merlone, and Ferenc Szidarovsky assert that the HHI may in certain cases be inappropriate. One case is where there are oligopolies with partially cooperative symmetric firms.[4] The index does not capture collusive behaviour since it is derived from firms' individual market shares. Secondly, in the semi-symmetric case, there is the possibility that cooperation has a decreasing effect on the index.

An HHI for the demand side

The HHI may be used to measure market concentration on the demand side. Instead of calculating market share, the contribution to total demand by each firm may be taken into account.

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4   Akio Matsumoto, Ugo Merlone, and Ferenc Szidarovsky, 'Some Notes on Applying the Herfindahl-Hirschman Index', *Applied Economics Letters*, August (2011).

The formula for the Herfindahl-Hirschman Index for the demand side is

$$H = \sum_{i=1}^{N} d_i^2$$

where H is the index, N refers to the number of firms in the market, and d_i refers to the contribution to total demand made by each firm.

A possible measurement of distributed market power

From the calculation of the HHI for the supply side (HHI_S) and the HHI for the demand side (HHI_d), a coefficient of distributed market power (C_{DMP}) can be derived

$$C_{DMP} = \frac{HHI_s}{HHI_d} \ .$$

The coefficient may have a value ranging from a theoretical 0 to infinity. While a value of 0 implies that the supply side has no power at all (perfectly competitive), the demand side has a high degree of market power. A value of 1 suggests that there is an even distribution of market power, while a value greater than 1 sees market power more on the supply side of the market.

In view of the problems and difficulties inherent in the application and interpretation of the HHI index in general and of this coefficient in particular, while applying this to bilateral oligopoly, it shall be limited to markets where there are few firms of roughly the same size, few buyers of the same size, and a homogenous product, and where there is no inter-firm or inter-buyer cooperation.

An integrated bilateral oligopolistic model

Going back to the initial market structure model in Table 1 and using the last four boxes in the model, it is possible to represent the behaviour of a market made up of a few buyers and a few sellers acting collectively or independently. In addition, sellers and buyers may negotiate individual packages or schemes depending on different conditions which the model would still have to identify. Sellers may compete or collude while buyers may cooperate with each other or not cooperate, or they may enter into negotiations with each other. In each of the quadrants, the use of the notional coefficient of distributed market power is represented in brackets.

Table 4 – An Integrated Bilateral Oligopolistic Model

		FEW SELLERS		
FEW BUYERS		**Compete**	**Negotiate**	**Collude**
	Not Cooperate	Bilateral Oligopoly $(C_{DMP} = 1$ *(with cmp)*	–	Monopoly Oligopsony $(C_{DMP} > 1)$
	Negotiate	–	Individual Negotiation $(C_{DMP} ind)$	–
	Cooperate	Oligopoly Monopsony $(C_{DMP} < 1)$	–	Bilateral Monopoly $(C_{DMP} = 1)$

cmp – countervailing market power   *ind* – indeterminate C_{DMP} – Coefficient of Distributed Market Power

This model attempts to give a structure to the analysis of bilateral oligopoly. There is no generalized theory that adequately explains oligopolistic behaviour, let alone one which explains bilateral

oligopolistic behaviour. If collusion or cooperation were to take place, then the models of monopoly and monopsony could provide a basis on which to model behaviour. However, non-collusive and non-cooperative behaviour, as well as individualized negotiation, are extremely difficult to model and therefore require deeper investigation.

Welfare and efficiency considerations

From the literature, it is not clear whether countervailing market power increases overall welfare, decreases it, or leaves it unchanged. Models which involve market power, such as monopoly and monopsony, tend to show that imperfections in the market lead to deadweight welfare losses. This is in line with the concept that the greatest level of welfare and efficiency that markets can offer is when they are perfectly competitive.

However, does countervailing power lead to stemming welfare losses arising from the power of sellers in the market? And will oligopolists transfer their acquired benefits to the consumer?

According to the literature reviewed by Chen[5] which consists mainly of papers by Ungern-Steinberg,[6] Dobson, Waterson and Chu,[7] and Erutku[8] efficiency, cost reductions, price benefits, product variety, innovation, and welfare gains among others depend on many different considerations. How concentrated are the markets on either side? Is there one large supplier or buyer and other fringe buyers? Are oligopsonists in the upstream market oligopolists in the downstream market where consumers have no market power? If there are gains to be made through bilateral oligopoly, are these gains passed on the final consumer, and if so, in what ways? In fact, are all consumers affected in the same

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5   Chen.
6   T. von Ungem-Stemberg, 'Countervailing power revisited', *International Journal of Industrial Organization*, Vol. 14 (1996), 507–20.
7   P. Dobson, M. Waterson, and A. Chu, *The Welfare Consequences of the Exercise of Buying Power*, Office of Fair Trading, Research Paper 16, OFT (London, 1998).
8   C. Erutku, 'Buying Power and Strategic Interactions'. *Canadian Journal of Economics*, Vol. 38 (2205), 1160–72.

manner? Or do some consumers pay certain prices while consumers who buy from fringe sellers are castigated because these have no or little bargaining power?

Andresen, Asche, Roll, and Tveteras adopt a methodological approach to the estimation of market power and provide an empirical application to the European dry salted cod market. They conclude that where both seller and buyer have market power, the quantity traded will be lower compared to a situation where only one side has market power.[9] Therefore, in such a situation, the oligopolist's negative influence on quantity traded will be reinforced if the oligopsonist reduces the market price of the good by reducing the quantity it purchases. This entails a welfare loss as it results in a lower quantity available of the final product as compared to the quantity available under competition.

Conclusion

This paper has sought to highlight bilateral oligopoly as a market structure and how the presence or absence of countervailing power tends to distort the market by having unevenly distributed market power.

In summary, bilateral oligopoly has been defined primarily as a market structure with few buyers and sellers having countervailing market power. Insights into some of Malta's oligopolistic structures have helped to show that it is possible to develop an understanding of the market with the existing theories and by integrating empirical elements especially for the purpose of testing the theories as required.

The development of the coefficient of distributed market power shows the notional measurement of countervailing market power, the degree of its presence or absence.

The integrated model of bilateral oligopoly takes into account the reality of negotiation and bargaining as a manner of how such a market may conduct itself.

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9   T.B. Andersen, F. Asche, K.H. Roll, and S. Tveteras, *Oligopoly and Oligopsony in Concentrated Supply Chains* (Peru, 2009).

As organizations become larger and cater for greater market shares, and as markets continue to grow both domestically and globally, the development of oligopoly and oligopsony models is becoming more important in the formulation of economic theory. Ultimately, a better understanding of these models will make economic theory of markets more relevant to entrepreneurs, managers, consumers, regulators and policy makers.