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Avrupa Birliği İktisadı Anabilim Dalı

A CONDITIONAL RESTRICTION OF THE MEMBER STATES: THE STATE AID POLICY OF THE EUROPEAN UNION

MA Thesis

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CONTENTS

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LIST OF ABBREVIATIONS

AoA	Agreement on Agriculture
ASCM	Agreement on Subsidies and Countervailing Measures
CAP	Common Agricultural Policy
CVD	countervailing duty
DG	Directorate-General (of the Commission of the European Communities or shortly European Commission)
EC	European Community
EU	European Union
EUR	Euro
FOC	first-order condition
GATT	General Agreement on Tariffs and Trade
MRS	marginal rate of substitution
MRT	marginal rate of transformation
MSs	Member States (of the EU)
OECD	Organization for Economic Co-operation and Development
OJ	Official Journal of the European Communities (Official Journal of the European Union since 1st of February, 2003)
PPF	production possibility frontier
PSO	public service obligation
R&D	research and development
R&R	rescue and restructuring
SA	State aid
SGEI	services of general economic interest
SGI	services of general interest
WTO	World Trade Organization

LIST OF FIGURES

ABSTRACT

Governments intervene in the markets because of conventional reasons (such as externalities), strategic trade policy, tax competition and political economy. Subsidies are among the tools of government intervention. They can be distortive in the context of international trade. Actual use of subsidies is usually not optimal. Therefore they are regulated at the multilateral level. European Union regulates subsidies by the State aids policy that strikes a balance between market distortions and benefits. State aids policy is a supranational policy applied mainly by the Commission.

In order to explain the policy a third-market strategic trade policy model with a Cournot duopoly is developed. Following the latest contributions in the literature by Glowicka and Collie investment subsidies are taken into consideration instead of output subsidies. The Commission is assumed to be a compliance-maximizing agency, not a social welfare maximizer. The model is enhanced with the introduction of externalities. Equilibria under different assumptions are calculated. It is shown that the Commission gives its decision on aids after a cost-benefit analysis. After discussion of elaborations the model is extended to political economy using a simplified Grossman-Helpman framework. As a result the first model on State aids policy that covers non-reciprocal externalities and political economy is provided.

ABSTRACT IN TURKISH:

OZET

Hükümetler piyasalara (dışsallıklar gibi) konvansiyonel nedenler, stratejik ticaret politikası, vergi rekabeti ve ekonomi politik yüzünden müdahale etmektedir. Sübvansiyonlar hükümet müdahalesi araçları arasında bulunmaktadır. Uluslararası ticaret bağlamında tahrifat yaratabilirler. Sübvansiyonlar genel olarak optimal olarak kullanılmazlar. Bu nedenle çoktaraflı olarak düzenlemeye tabi tutulurlar. Avrupa Birliği sübvansiyonları, piyasa tahrifatları ile faydalar arasında bir denge kurmaya çalışan Devlet yardımları politikası ile düzenlemektedir. Devlet yardımları politikası esas olarak Komisyon tarafından uygulanan uluslarüstü bir politikadır.

Politikanın açıklanması için Cournot duopolü içeren üçüncü piyasalı bir stratejik ticaret politikası modeli geliştirilmiştir. Yazına Glowicka ve Collie tarafından yapılan en yeni katkılar takip edilerek çıktı sübvansiyonları yerine yatırım sübvansiyonları dikkate alınmıştır. Komisyon'un toplumsal refahı maksimize eden değil, kanunlara uyumu maksimize eden bir ajans olduğu varsayılmıştır. Model dışsallıklar aracılığıyla zenginleştirilmiştir. Farklı varsayımlar altında dengeler hesaplanmıştır. Komisyon'un yardımlara dair kararlarını bir kâr-zarar analizinden sonra verdiği gösterilmiştir. Ayrıntıların tartışılmasından sonra model basitleştirilmiş bir Grossman-Helpman çerçevesi kullanılarak ekonomi politiği kapsayacak şekilde genişletilmiştir. Sonuç olarak Devlet yardımları politikasına ilişkin karşılıksız dışsallıkları ve ekonomi politiği kapsayan ilk model temin edilmiştir.

1. INTRODUCTION

The aim of the present study is to explain the function of European Union's (EU)[1] State aid (SA) policy that basically regulates national provision of trade-distorting production-related subsidies in the context of European economic integration.

The rationale behind the SA policy can be found in several official documents: "State aid that distorts intra-Community competition is prohibited by the Treaty."[2] However the policy is characterized by several exceptions and provisions elaborating on these. Therefore the analysis of SAs should be refined in the following way: The SA policy of the EU is designed to prevent Member States (MSs) from giving subsidies that have distortive effects in the context of European economic integration unless they are otherwise acceptable. This hypothesis requires a more general approach than a concentration on the Single European Market (SEM)[3].

In this context and given that all SAs are subsidies (while the vice versa is not true as it is explained in the third chapter) the first question of the study is the following: Why do governments give subsidies? The answer is simple: To intervene in the markets. Several reasons exist for government intervention and there is no overall agreement among social scientists, thinkers or policy-makers on this issue. Moreover subsidies cannot be a suitable tool for every case of government intervention. However an overview of these reasons is carried out in the second chapter to lay down the foundation of the study[4]. Then subsidies are analyzed as a tool of government intervention in the context of international

[1] EU consists of three legally separate components that are usually referred as the three pillars: European Communities (European Community, EURATOM and until 2002 European Coal and Steel Community), Common Foreign and Security Policy and cooperation in justice and home affairs. Therefore from a legal point of view EU and European Community (EC) are not the same entity. However the term EU is endorsed instead of the legally proper EC in this study since this usage has become conventional both in the media and the non-legal academic literature. An important study on European integration that adopts this approach is the following title: Wallace, H. and W. Wallace (eds.). 2000. *Policy-making in the European Union*. New York: Oxford University Press.

[2] Commission of the European Communities. 2000. *Competition Policy in Europe and the Citizen*. Belgium: p. 29.

[3] SEM is also called as the single market, common market or internal market.

[4] For a monograph on SA published by the Commission of the European Communities (whose unofficial name is the European Commission) that adopts the same approach see: European Commission. 1999. *European Economy* 3. Belgium.

economics. Since such subsidies are distortive they are regulated at the multilateral level. A brief section on these multilateral regulations concludes the second chapter and provides a connection to the following one.

The third chapter, which is devoted to a brief presentation of the SA policy itself, is partially descriptive and partially analytical. First of all the rationale of the policy is briefly examined referring to the theory of international economic integration. Then the concept of SA in EU law is explained. A section on the application of the policy, its institutional aspects and characteristics and historical development follows.

While the third chapter predominantly deals with legal and administrative aspects the fourth chapter is strictly based on the economics literature. First the scarce literature on the SA policy is reviewed. There are two types of studies in the literature: econometric political economy studies and theoretical modeling studies. Following the literature review the chapter provides a contribution to the latter strand of research based on the most recent articles. The model is enhanced with an original contribution on externalities in order to support the hypothesis. Then an extension is made to cover political economy considerations. The policy implications are also discussed.

The final chapter concludes by a brief overview of the study and questions for further academic research.

2. GOVERNMENT INTERVENTION IN THE MARKETS AND SUBSIDIES

2.1. Economic Efficiency without Government Intervention

In basic economic theory there is no place for government intervention. The markets, where supply and demand meet each other, can function efficiently by themselves, i.e. Adam Smith's "invisible hand" works well. However in real life it is observed that the governments frequently and heavily intervene in the markets. Therefore in order to evaluate government intervention, first one has to understand the concept of efficiency from an economic perspective[5].

* * *

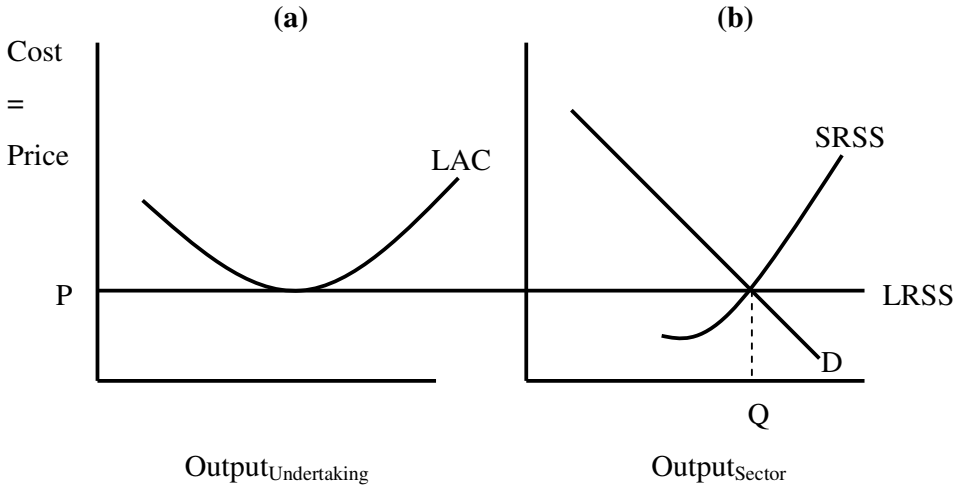
Resources are scarce. This is a fact of nature (and *raison d'être* of economics). As a result it is not possible to answer all of the wants or even some of the needs in the society. Resources have to be allocated between different goods and services. Efficiency is a concept related to this allocation. If the scarce resources are utilized in such a way that the best possible amount of goods and services are produced it can be said that economic efficiency is attained.

There are different kinds of efficiency: productive and allocative. Productive efficiency, which should not be mixed with production efficiency is a concept related to the production of a single undertaking. It occurs when the undertaking produces a good or a service by using the least resources or at the minimum cost, i.e. when its short-run average (total) cost curve is tangent to its long-run average cost curve at its lowest point.

[5] This section is generally based on the following sources: Begg, David, Stanley Fischer and Rudiger Dornbusch. 1994. *Economics. Fourth Edition*. Berkshire, England: Mcgraw-Hill: pp. 132-154, 256-276, 326-337; Demir, Osman. 1997. *Ekonomide Devlet*. Ankara: Sermaye Piyasası Kurulu: pp 199-204; Harvey, David. 2000. "Policy Primer - The Basic Economic Analysis". Available from the World Wide Web: <http://www.staff.ncl.ac.uk/david.harvey/AEF372/Primer.pdf.>.

Figure 2.1

A Perfectly Competitive Market



Source: Adapted from: Begg, David, Stanley Fischer and Rudiger Dornbusch. *op. cit.*: p. 141.

While productive efficiency deals with a single undertaking the concept of allocative efficiency is used to evaluate a market or even the entire economy under the General Equlibrium theory. However a precondition is needed for allocative efficiency: perfectly competitive markets.

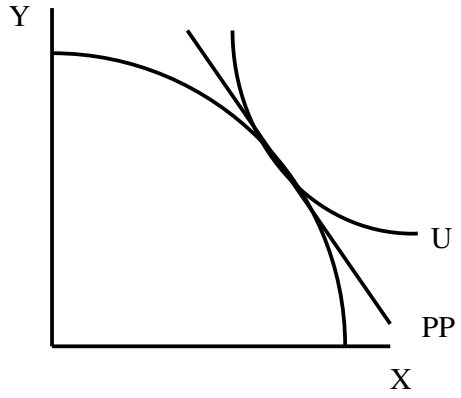
A market is perfect if it has the following characteristics: (1) All actors are price takers, i.e. there are a large number of buyers and sellers. (2) The goods or the services supplied are homogeneous. (3) The market is contestable, i.e. there is free entry and exit. (4) All actors have perfect information. (5) Private costs and benefits are not different than social costs and benefits (Earlier versions of perfectly competitive market conception implicitly assumed that there were no transaction costs. However modern versions take these into account and also relax the assumption of perfect information[6].).

Figure 2.1 above presents the extreme, but typically illustrated case of a perfectly competitive market with a horizontal supply curve in the long run. Panel (a) shows that a specific undertaking within the market produces on the lowest point in the LAC. In panel (b) the outputs of these undertakings add up to provide the horizontal long-run sector

[6] Harvey, David. *op. cit.*: p. 1.

Figure 2.2

PPF and Indifference Curves



Source: Begg, David, Stanley Fischer and Rudiger Dornbusch. *op. cit.*: p. 331.

supply curve (LRSS). Short-run sector supply curve (SRSS) intersects with the demand curve (D) on LRSS. Quantity Q is produced at price P. Allocative efficiency has three components: production efficiency, consumption efficiency and exchange efficiency. When all three of these efficiencies are achieved allocative efficiency occurs.

Producers are profit maximizers. They produce at the point of tangency of an isoquant to the lowest possible isocost line to minimize their costs. Production efficiency is attained when marginal rates of technical substitution between factors of production are equal in production, i.e. when the production takes place on the production possibility frontier. In this case it is not possible to increase production by substitution of one factor of production by another one. The slope of the production possibility frontier is called the marginal rate of transformation.

Consumers are utility maximizers. They maximize their utility by consuming at the point of tangency of their budget line to the highest possible indifference curve. At this point the marginal utilities of the products are equal to each other in terms of their prices. The slope of the indifference curve at the point of the tangency is called the marginal rate of substitution. Consumption efficiency is attained when the marginal rates of substitution between products is equal for all consumers.

After laying down the conditions of production and consumption efficiencies it is possible to explain exchange efficiency and complete the analysis of allocative efficiency. Figure 2.2 above shows the production possibility frontier (PPF) for an economy consisting of two products (X, Y). As stated above the slope of the PPF is the marginal rate of transformation. Exchange efficiency occurs when the PPF is tangent to highest possible indifference curve, U. The slope of the indifference curve equals to that of equilibrium price line PP: the marginal rate of substitution (MRS). Therefore at the point of tangency of PPF to the indifference curve the following equation holds:

$$MRT_{X,Y} = MRS_{X,Y}$$

This analysis can be can be developed by integrating an Edgeworth Box (named after 19th century economist Francis Y. Edgeworth) to the PPF. An Edgeworth Box consists of two separate diagrams superimposed on each other so that two different products or consumers can be examined together. In the former case Edgeworth Box shows that the points of tangency of production isoquants are connected to obtain the production contract curve. In the latter case the Box illustrates the consumption contract curve which consists of the points of tangency of the indifference curves of the consumers.

In the Figure 2.3 below there are two products (X, Y) and two consumers (A, B). The Figure both shows the optimal levels of production and consumption and the allocation of consumption between the consumers. Therefore the figure is superior in illustrating allocative efficiency in a better way than the previous one.

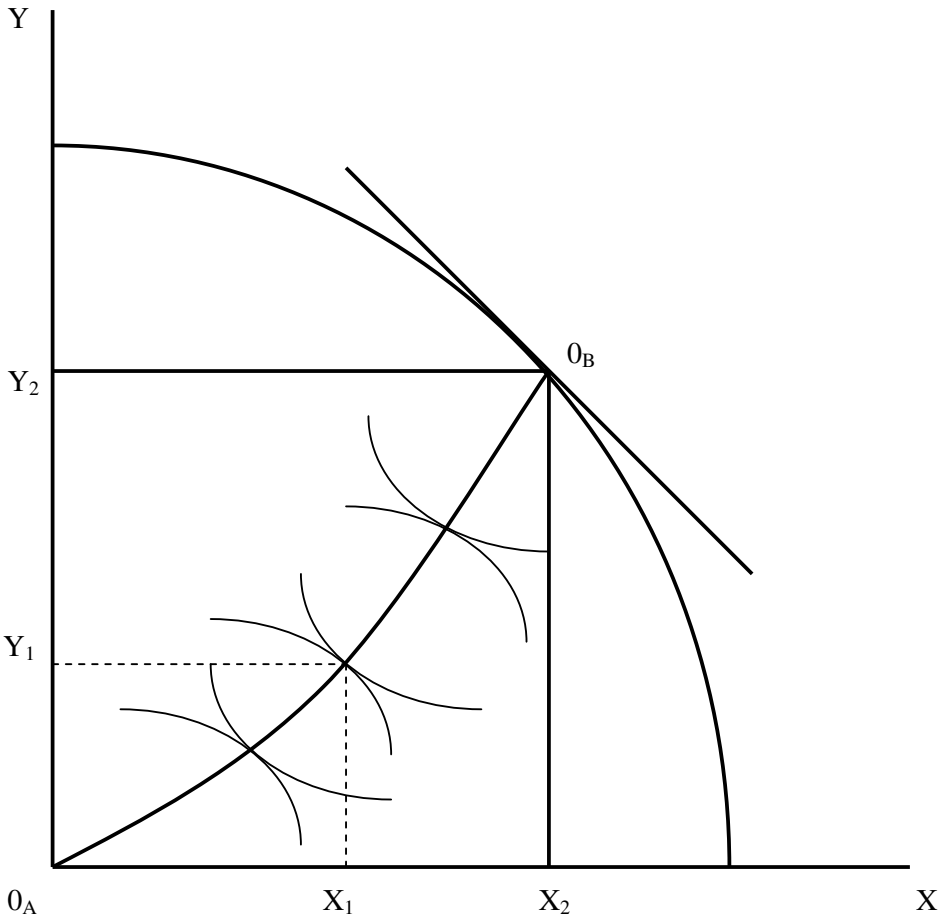
Total production is 0_AX_2 for product X and 0_AY_2 for product Y. Consumer A consumes 0_AX_1 of X and 0_AY_1 of Y, consumer B consumes X_1X_2 of X and Y_1Y_2 of Y. Therefore the previous equation can be rewritten as follows:

$$MRS^A_{X,Y} = MRS^B_{X,Y} = MRT_{X,Y}$$

That means for any distribution of goods between the consumers there is an optimum mix of production.

Figure 2.3

PPF and Edgeworth Box



Source: Demir, Osman. *op. cit.*: p. 203.

Under the above equation the economy is in general equilibrium. It is the price mechanism, that is the market that enables the economy to reach this equilibrium; because each producer determines its isoquant by reference to its isocost line and each consumer decides on her/his indifference curve by reference to her/his budget line. Then these isoquants and indifference curves interact to form production and consumption contract curves which interact to create the general equilibrium. In other words the market is able to reach the social optimum by itself[7].

[7] The social optimum can be described as the point of tangency of the utility possibility frontier to the highest possible social indifference curve. Harvey, David. *op. cit.:* pp. 3-4. The graphical representation would be like the one in Figure 2.3.

2.2. Reasons of Government Intervention in the Markets

In the previous section it was shown that a perfectly competitive market is efficient. The concept of Pareto efficiency (named after economist and sociologist Vilfredo Pareto) underlines this analysis. Pareto efficiency requires that given an allocation of resources it is not possible to obtain a reallocation that would make one actor better off and no one worse off. Such an allocation maximizes social welfare and therefore requires no government intervention to improve welfare.

However as stated at the beginning of the section in real life it is observed that the governments do intervene in the markets. Indeed government intervention is one of the most important themes in the modern microeconomics literature in one way or the other. Unfortunately a general classification of the reasons of government intervention does not exist. Therefore the study presents its own classification: conventional reasons (transaction costs, coordination failures, market failures and paternalistic reasons[8]), intergovernmental competition and political economic reasons.

2.2.1. Conventional Reasons

2.2.1.1. Transaction costs

Whenever the forces of supply and demand meet each other in the equilibrium point an exchange (or transaction) occurs. In other words markets are frameworks for making exchanges. However supply and demand is not for free. Resources are used for searching, sometimes bargaining[9] and contracting for the exchange as well as for following through the terms of the exchange contract. These resources are costs to the parties of the exchange and therefore they are named as transaction costs. Transaction costs might include just time and energy or much costlier items such as intelligence gathering,

[8] Discussions carried out with Murat Çokgezen from Marmara University Department of Economics in October 2003 were helpful in the classification of conventional reasons.

[9] Bargaining for an exchange is a situation where two actors are willing to engage in a mutually beneficial trade, but have conflicting interests over the terms of trade. See the following: Muthoo, Abhinay. 2000. "A Non-Technical Introduction to Bargaining Theory". *World Economics,* Volume 1, Number 2: pp. 146 (The definition has been adjusted slightly in order to avoid confusion with coordination failure, a concept mentioned below.). What this study calls searching for an exchange is the process whereby an actor seeks to find another actor to exchange. Search might lead to bargaining of course.

arbitration and legal services. The branch of economics literature that deals with these costs in called Transaction Costs Economics.

If transaction costs of an exchange are higher than its benefits no exchange would occur. If transaction costs are higher in general than the benefits for a certain type of exchange, no market would be formed. If a non-existent market would have been formed if the relevant transaction costs were lower, than one could state that there is a missing market.

Thrainn Eggertson argues in *Economic Behavior in Institutions* information gathering, information processing, contracting, performance of the contracts, costs created by the complex structure of organizations are all transaction costs. According to Eggertson transaction costs consist of information and exchange costs. Information costs might exit even when there is no exchange. For example a self-subsistent farmer still needs to have some information to produce for himself. Information creates costs while (1) collecting information on factor prices, quality, potential buyers and sellers, their behavior and motivations, (2) determining the price that enables the exchange, (3) preparing a contract, guaranteeing that it is performed and enforcing it if necessary, (4) protecting property rights[10].

Transaction costs justify government intervention for the enforcement of contracts and the establishment (and enforcement) of property rights.

As stated above every exchange is a contract. The success of the exchange, that is its mutual beneficence depends on the fulfillment (or performance) of the contract. In contracts with a term the success requires expected fulfillment. If fulfillment does not occur the contract should be enforced and this requires government intervention (although not always).

Property rights, entitlements to certain benefits from a particular resource, are closely related to enforcement of contracts. If property rights are not established and if necessary enforced, for some actors the costs of exchange (or investment) would become more than

[10] Eggertson, Thrainn. 1992. *Economic Behavior and Institutions*. Cambridge: Cambridge University Press: pp. 13-5; as quoted in: Demir, Osman. op. cit.: p. 273.

those of seizure. Therefore some of the mutually beneficial transactions would be replaced by unilaterally beneficial ones.

2.2.1.2. Coordination failures

"Coordination is the process through which human beings take each other into account, explore the alternatives of action which are of concern to them and choose a strategy that leads to a stable outcome which is in their common interest."[11] A coordination failure occurs when actors fail to coordinate or their coordination fails to achieve an optimal equilibrium; so coordination failure does not mean lack of coordination.

Transaction costs might cause these sub-optimal outcomes (Sometimes the term coordination cost is used to refer to the relevant costs.).

In game theoretic terms all of the games with multiple equilibria where one or more of the equilibria are Pareto-inferior for one or more of the players are situations of coordination failures[12]. The classical example is the Battle of the Sexes game[13], one of the best-known stylized games in game theory.

Therefore government intervention can be economically legitimate in a case of coordination failure if the government ensures that the actors reach the Pareto-superior equilibrium among the possible set of equilibria.

Coordination failure is more likely to appear as the number of actors involved in the exchange increase. In larger groups (and in more complex exchanges) coordination mechanisms or devices are needed.

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[11] Lane, Jan-Erik. 2003. "The Economic Origins of Government". Singapore: National University of Singapore Public Policy Programme Working Paper PPP-34-03. Available from the World Wide Web: <http:// www.fas.nus.edu.sg/ppp/docs/wp/wp34.pdf>. [cited: 02.08.2004]: p. 2.

[12] The necessary and sufficient conditions for coordination failures were laid down by the following study: Cooper, Russell. and Andrew John. 1988. "Coordinating coordination failures in Keynesian models". *Quarterly Journal of Economics,* Volume 103: pp. 441-463. The authors established that the necessary condition is the existence of strategic complementarities, i.e. the situation that the optimal strategy of an actor is depended on the strategies of the other actor/s.

[13] Goeree, Jacob K. and Charles A. Holt. 2000. "Coordination Games" in L. Nadel (ed.). *Encylopedia of Cognitive Science*. London: Macmillan. According to the authors in repeated games factors such as history of past decisions can solve the coordination failure; but they also state that in real life many games are played for only once.

The market itself is one such mechanism of course. A person who wants to buy a second hand car goes to the relevant physical market instead of wandering in the streets.

However markets cannot replace the need for governments. First of all as explained above markets themselves need the government for institutional/legal frameworks because of enforcement reasons. What is more markets might not be able to solve all cases of coordination failures. Some car owners might be better off if they sell their vehicles, but they might not know about the price our potential buyer is ready to give and therefore not consider selling. Finally a market does not exist for every exchange. When the car buyer purchases her/his car and starts riding s/he will eventually meet a pedestrian trying to cross the road. The exchange here is on the passage right. If the driver and the pedestrian fail to coordinate, an accident would occur. However there is no market for spontaneous passage rights and it is not feasible to create one. Therefore the government intervenes by placing traffic lights, signs and zebra crossings.

Traffic rules are an example for regulation or limitation of actors' freedom of action. Regulation can be seen as forced contractual relationship. Enforcement of such a relationship upon the society (be it individuals or undertakings) requires governmental power instead of non-governmental means[14,15].

[14] It should be noted that the society itself can have traditional or customary rules that are enforced on its members, but such rules take time to evolve and their enforcement cannot be as effective as governmental enforcement in modern societies.

[15] Lane argues that government intervention is economical because of economies of scale:

> "When two persons have a common interest, then the existence of a mechanism that offers correlated strategies entails that they can make an agreement about what to do and that the agreement will be enforced. (...) Such an enforcement mechanism may be called 'government' or 'political authority' when it is made valid for a larger group of individuals. Again the reason would be economical in nature. An enforcement mechanism would develop economies of scale in providing third party coordination. Thus, it would be efficient for a society to have one enforcement mechanism that would develop its order to be valid for a group of N persons, i.e. create a legal order."

Lane, Jan-Erik. *op. cit.*: pp. 6-7.

2.2.1.3. Market failures

Transaction cost economics and coordination failures both explain the occurrence of sub-optimal outcomes in exchanges; but they do not cover all cases of market underperformance, that is all cases of market failures.

A market failure occurs when the market fails to allocate the scarce resources in an efficient way. Transaction costs and coordination failures may lie under some market failures; but there are more specific reasons. Public goods and common resources, externalities, informational failures (and missing markets other than those related to externalities) and sub-optimal market structures are briefly examined below (It has been suggested that other failures such as undefined property rights and time lags exist. However there is no need to increase the fourfold classification laid down here as there suggested failures can be accepted as externalities.).

2.2.1.3.1. Public goods and common resources[16]

Goods (and services) can be classified using two variables: excludability and rivalry. Excludability is the property of a good that determines whether someone can be prevented from using it or not. Rivalry is the property of a good that determines whether someone's use of the good diminishes other people's use of it. A non-excludable good is open to consumption by everybody. The consumption by one person of a non-rival good does not diminish the amount available to others.

Figure 2.4 below presents with some examples the fourfold classification of goods based on these two properties: private goods, natural monopolies[17], common resources and public goods. Private goods require no government intervention in the context of market failures and natural monopolies are mentioned elsewhere. Therefore the present discussion is limited with public goods and common resources.

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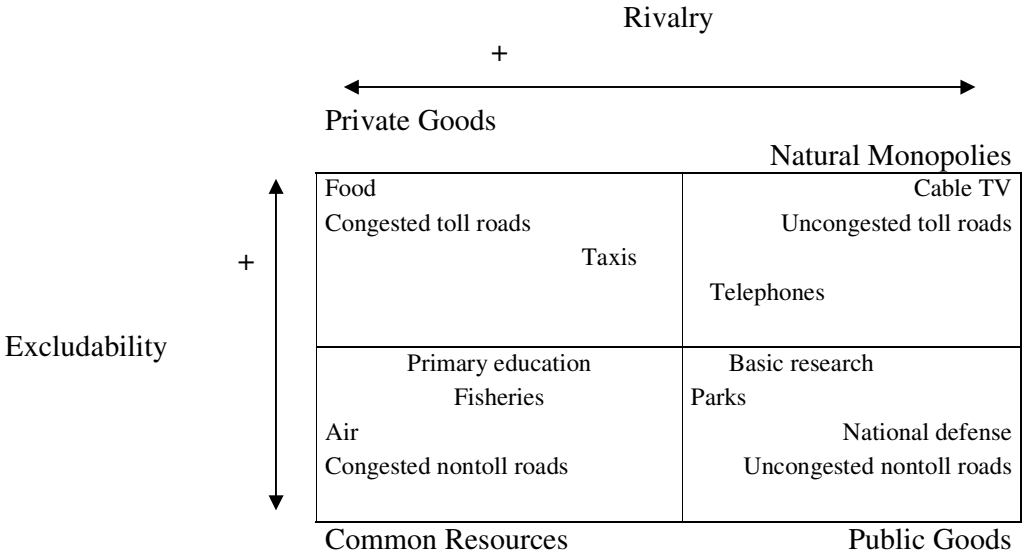
[16] This part and the following one on externalities are generally based on the following resources: Begg, David, Stanley Fischer and Rudiger Dornbusch. *op. cit.:* pp. 256-293; Demir. *op. cit.:* 125-149; Mankiw, N. Gregory. 2004. *Principles of Economics. Third Edition.* USA: Thompson, South-Western: pp. 203-239. Additional and specific references are given whenever necessary.

[17] Sometimes the terms toll goods or club goods are used instead of the term natural monopolies.

Figure 2.4

Classification of Goods According to Excludability and Rivalry



Source: Adapted from Mankiw, N. Gregory. 2004. *Principles of Economics. Third Edition.* USA: Thompson, South-Western: p. 224.

The provision of public goods requires government intervention; because rational people free ride them. Since public goods are both non-excludable and non-rival, people can consume them without actually paying for them. Therefore the phenomenon of free riding does not allow the market mechanism to yield efficient allocations for public good provision and government intervention is economically legitimized[18].

It has been assumed until now that public goods are pure. On the contrary they can also be and frequently are impure. Semi-public goods are semi-non-rival. The goods in question do not diminish, but after a point the utilities of consumers decrease. This is the case, for example, in a public park. When there are a few people consumers enjoy the park; but when it becomes crowded even though the park does not diminish its benefit to the consumers does so. Semi-public goods are also semi-non-excludable. It is in fact often

[18] In fact there is a market-based solution to the public goods problem called the Lindahl pricing. When these prices are charged all consumers prefer the same amount of the good and this amount is efficient. However there are problems with Lindahl pricing. It is difficult to apply in practice as it is not possible to calculate the marginal benefits consumers gain from a level of output, it depends on consumers acting as price-takers and that excludability is essential for its application. See: Holcombe, Randall G. 2005. *Public Sector Economics: The Role of Government in the American Economy.* Prentice-Hall: pp. 89-90.

possible to exclude people. However this is difficult or expensive. For example it is possible to make people pay to enter the park; but if the park is too small the toll would not be feasible.

Semi-public goods approach common resources in terms of their properties. Common resources are non-excludable like public goods and rival like private goods. As a result common resources form a problem named after a classic parable: the Tragedy of Commons. Consider a forest village. Deers living in the nearby forest is a common resource of the village. The villagers do not pay for hunting them; so they hunt as much as they can. Unfortunately this does not allow the minimum number of deers to sustain the deer herd. Deers become extinct and the villagers lose a source of wealth[19].

Both public goods and common resources justify government intervention since consumers cannot attain efficient levels of consumption of these by themselves.

2.2.1.3.2. Externalities

"An externality exists when the production or a consumption of a good directly affects businesses or consumers not involved in buying and selling it and when those spillover effects are not fully reflected in market prices."[20] In other words an externality is the divergence between the marginal private cost and marginal social cost of production or between the marginal private benefit and marginal social benefit of consumption. The difference between the marginal private and social costs can be named as the marginal external cost and the difference between the marginal and social benefits can be called marginal external benefit. The external impacts of production and consumption are also called spillovers.

The general classification of externalities takes into accounts two variables: source and impact. Externalities can either be production or consumption externalities according to their sources and positive or negative externalities according to their impact. A positive externality is also called as a quasi-public good.

[19] There is a market-based solution for non-excludability valid for both public goods and common resources : the Coase Theorem. This idea will be studied in connection to externalities.
[20] Begg, David, Stanley Fischer and Rudiger Dornbusch. op. cit.: p. 52.

Figure 2.5

Externalities

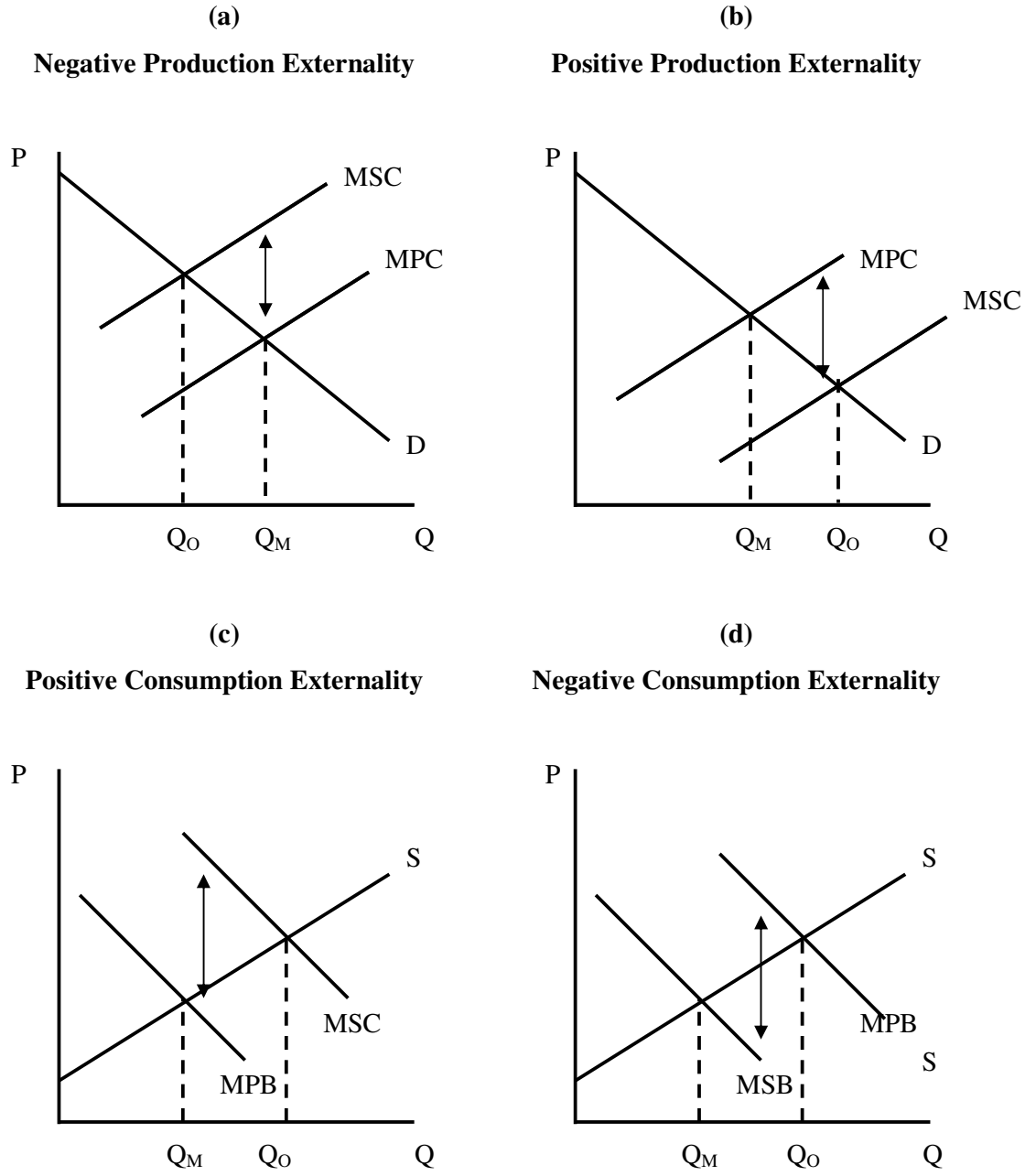


Figure 2.5 above shows different types of subsidies with regard to these variables. In all panels of the figure there is a divergence between the optimal consumption Q_O and the market consumption Q_M. The differences in question, in other words marginal external costs or benefits are shown by arrows in the graphs. The market mechanism fails to

achieve the efficient allocation because of externalities. Examples for the panels of Figure 2.5 can respectively be noise created by transport vehicles, research and technology development, education and hunting of an endangered species.

Externalities can be further categorized with regard to their specific sources or impacts. Some examples are environmental externalities, network externalities, agglomeration externalities and intertemporal externalities.

Since externalities do not allow the market mechanism to function efficiently their existence justifies government intervention in principle[21]. However there is also a frequently mentioned market-based solution for the externalities and also the public goods and common resources problems: The Coase theorem.

Coase theorem takes its name from the famous British economist Ronald H. Coase who introduced the idea in the article "The Problem of Social Cost" (1960, *Journal of Law and Economics*, v. 3, no. 1, pp. 1-44). The theorem briefly states that when there are no transaction costs it is possible for interested private parties to bargain and reach agreements to solve public goods and externalities problems by themselves. In this case legal entitlements have no importance; any initial allocation of property rights will lead to an efficient outcome.

However it is not possible to neglect transaction costs and Coase whose equally famous article "The Nature of the Firm"[22] explains the existence of firms instead of contracts between self-employed people by transaction costs, is aware of this fact. When the transaction costs are positive the Coase theorem implies that the initial distribution of private property rights are important[23].

There have been numerous criticisms to the Coase theorem. The most obvious one is that when transaction costs are very high it would not be possible to conclude a private bargain.

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[21] In principle means not always. There are two types of externalities that do not require government intervention: pecuniary (vs. technological) externalities and inframarginal externalities. See: Holcombe, Randall G. *op. cit.*: p. 78-81.

[22] The article was originally published in 1937. An electronic version is available from the World Wide Web: <http://people.bu.edu/vaguirre/courses/bu332/nature_firm.pdf>.

[23] Giray, Filiz. 2003. "Dışsallıklar: Coase Teoremi". *İktisat* 441-444: pp. 67-75.

Another criticism is that Coase theorem is too optimistic about private cooperation. Private parties might not be able to reach mutually satisfactory solutions. In other words coordination failures might arise. Moreover those adversely affected might not be able to determine the source of effect and enforce their rights. Therefore the Coase theorem does not provide a certain alternative to government intervention.

Despite these criticisms Coase theorem is frequently cited by those authors who are critical of government's involvement in economic affairs. These authors advocate contractual, market-based solutions such as marketable pollution permits instead of government regulation[24]. However it should be emphasized that the Coase theorem in its revised form actually lays down the necessity of government for private solutions to work.

2.2.1.3.3. Informational failures[25]

One of the characteristics of perfectly competitive markets is that all actors have perfect information. In reality most of the producers and consumers have imperfect information. They cannot accurately value the benefits and costs of a good or a service. Therefore they have to make decisions under uncertainty and take the associated risks. This might lead to sub-optimal choices being made. In that case informational failures occur.

Two well-known cases of informational failures are moral hazard and adverse selection problems. In both cases the problem is caused by informational asymmetry, i.e. parties having different level of information. Moral hazard occurs when a party carries out inappropriate behavior benefiting from the terms of the contract between herself/himself and the other party. Adverse selection occurs when the seller has more information about the attributes of the goods being sold compared to the buyer. As a result the seller might make the buyer select a good with undesirable attributes.

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[24] For a general argument see: Cowen, Tyler. 2002. "Public Goods and Externalities" in The Concise Encyclopedia of Economics. VA: George Mason University James M. Buchanan Center. Available from the World Wide Web: <http://www.econlib.org.>. [cited: 01.10.2004]. Cowen also says "The imperfections of market solutions to public goods problems must be weighed against the imperfections of government solutions." For an argument in the context of environment see: Lévêque, François. 1996. "Externalities, public goods and the requirement of a state's intervention in pollution abatement". Paris: CERNA.

[25] This section is based on the following sources: Begg, David, Stanley Fischer and Rudiger Dornbusch. *op. cit.*: pp. 239-241, 273-275; Mankiw, N. Gregory. *op. cit.:* pp. 480-482.

There are various ways of solving or reducing informational failure problems. Some of them require special terms in the contracts, screening or signaling, an indirect way of convincing the other party about the private information one desires to reveal.

However some informational failures require government intervention. For example only the government can make it compulsory for sellers to reveal their private information through labeling and reduce adverse selection problems. Another example is that small and medium sized enterprises find it difficult to obtain credits from credit institutions because of moral hazard and adverse selection. To solve this problem the government can subsidize credits to these enterprises or even finance them directly[26].

2.2.1.3.4. Other missing markets[27]

The problem of externalities studied above can be thought of as a problem of a missing market: There is no market for the externality and therefore it cannot be priced. There are other missing markets, those for time and risk.

The present and the future are linked. Production and consumption decisions made for the present have implications for the future. Intertemporal externalities might arise because of these decisions and the marginal social benefit and cost at a future time might not equal each other. If the economic actors had complete information about the future their decisions about the present could change. Forward markets (vs. spot markets) are a useful tool in this context. In these markets sellers and buyers can make contracts today for goods that will be delivered in a specified future date at the price agreed today. A complete set of forward markets for all commodities for all future dates would enable the producers and consumers to make consistent plans for the future (However the problems of myopia and commitment would remain to be solved.).

Another missing market is that of risk. A complete set of insurance markets would redistribute risk between those people with different risk-taking behavior. The equilibrium

[26] Meiklejohn, Roderick 1999. "The economics of State aid." *European Economy* 3. Belgium: European Commission: pp. 29-30.
[27] This section is based on Begg, David, Stanley Fischer and Rudiger Dornbusch. *op. cit.*: pp. 272-273.

price would equate the marginal social benefit and cost of risk-taking. However because of informational failures there is no complete set of insurance markets.

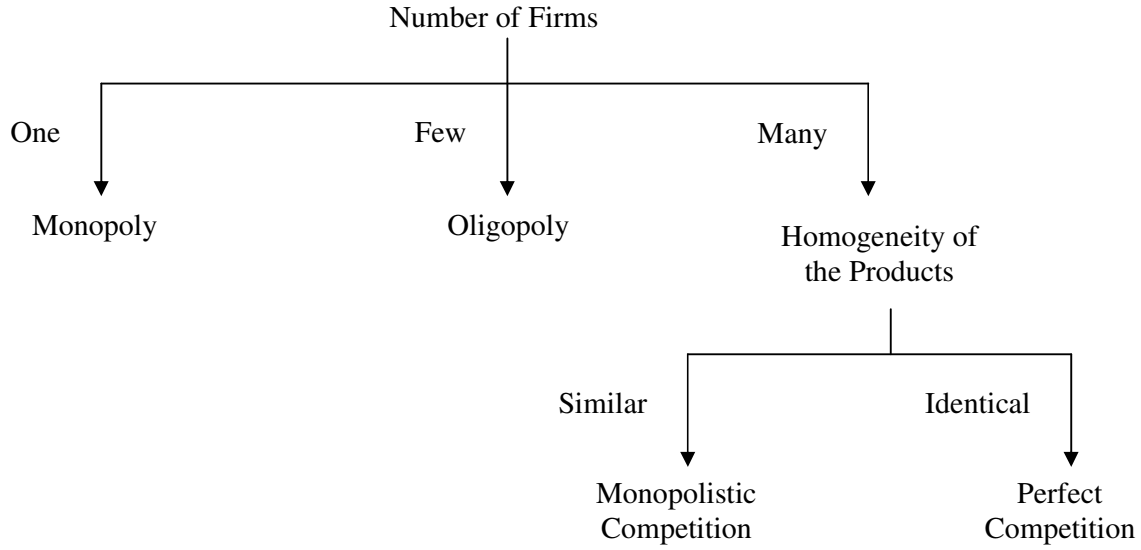
As a result the market equilibria for future goods and risky goods might not be efficient because of missing markets. Government intervention can be beneficial as in the informational failures problem.

2.2.1.3.5. Sub-optimal market structures

In a perfect market there is a large number of buyers and sellers so that all actors are price takers, the goods and services supplied are homogeneous and the market is congestable, i.e. there is free entry and exit. A market that does not have these characteristics cannot maximize social welfare, i.e. it is sub-optimal. In reality most of the markets are not perfect. Figure 2.6 below present a classification of markets according to the number of firms and the homogeneity of the products.

Figure 2.6

Categorization of Market Structures



Source: Adapted from Mankiw, N. Gregory. *op. cit.*: p. 347.

Different market structures exist because of economies of scale effects. Economies of scale or increasing returns to scale occur when the long-run average cost of a firm decrease as its output increase (If long-run average costs remain constant then constant returns to scale, if they increase then decreasing returns to scale or diseconomies of scale occur.).

Market structures other than perfect markets are sub-optimal[28]; because they create deadweight losses. Government intervention can prevent the formation of such a loss or decrease its magnitude. The proper method of intervention depends on the market structure.

2.2.1.4. Paternalistic reasons

Sometimes even if the markets function efficiently the resulting outcome is not satisfactory according to a paternalistically motivated government. Such a government might employ two justifications for intervention to the markets: equity and redistribution and merit goods.

All governments try to improve the well-being of those members of the society who are less fortunate or want to ensure a minimum standard of living for all. This aim can be called as equity. Some governments also want to achieve a certain level of social equality (because of structural reasons such as the existence of a welfare state or ideological preferences.). In both cases governments redistribute income[29].

In public finance literature it is usually accepted that there is an inherent tradeoff between redistribution and efficiency; because redistribution distorts behavior of economic agents. Therefore redistribution comes at a price[30].

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[28] In fact it is not possible to form a general comment on the welfare impacts of oligopolies because of strategic interdependence. Under collusion an oligopoly is equal to a monopoly. However under price competition with homogeneous products and constant, symmetric marginal costs a duopoly would price at the level of marginal cost. In other words under what is called Bertrand (price) competition an oligopoly is equal to perfect competition. For the cases between these two extremes it is possible to make a generalization using the Cournot model: In an oligopoly with N firms equilibrium price is closer to perfect competition the greater N is. See: Cabral, L. 2000. *Introduction to Industrial Organization*. Cambridge: MIT Press: pp. 101-114.

[29] For the issues involved in redistribution see: Holcombe, Randall G. *op. cit.*: pp. 336-353.

[30] However this tradeoff might disappear if one adopt different welfare criterion than the Paretian one. According to the Pigovian welfare criterion (after economist Arthur Pigou) money income has a diminishing

Merit goods are those goods that the government believes every relevant individual should at least have up to a certain level, regardless of whether they are actually demanded at all or up to that level. Merit bads or demerit goods are opposites. For example education is a merit good and alcohol consumption is a demerit good. Governments subsidize education and tax alcohol to achieve certain levels of consumption[31].

2.2.2. Intergovernmental Competition

Conventional reasons explain government intervention without taking into consideration the existence of foreign governments. However the existence of more than one government creates further reasons for intervention because of the phenomenon of intergovernmental competition. These reasons are not considered among the conventional ones because (1) they are relatively new contributions to the economics literature and (2) there is no general agreement regarding their validity.

2.2.2.1. Strategic Trade Policy

Strategic trade policy (sometimes called as strategic industrial policy) is a modern mercantilist theory, which argues that under imperfect competition (more specifically under oligopoly) in international markets national governments can shift profits from foreign producers to domestic ones by intervening to the market in question. It is usually considered that a subsidy is the suitable tool for strategic government intervention.

Strategic trade policy literature stems from two articles by Brander and Spencer where the authors prove that the above argument is true, that the optimal strategic policy is a subsidy and also that the subsidy-ridden international equilibrium is jointly sub-optimal[32]. Brander

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marginal utility and therefore redistribution of income from the rich to the poor can improve social welfare. Another option is to adopt the conservative social welfare function (described by Max Corden in his 1974 classic *Trade Policy and Economic Welfare*). This welfare criterion is based on income maintenance. Its policy proposal is trying to avoid shocks to the incomes of particular groups within the society. Greenaway, David. 1983. *International Trade Policy*. London: Macmillan: pp. 61-2.

[31] The merit good argument also has a non-paternalistic dimension under Paretian welfare criterion: Externalities associated with the consumption of these goods might improve efficiency under government intervention. See: Begg, David, Stanley Fischer and Rudiger Dornbusch. *op. cit.*: pp. 283-284.

[32] Spencer, Barbara and James A. Brander. 1983. "International R&D rivalry and industrial strategy". *Review of Economic Studies,* Volume 50: pp. 702-722; Brander, James A. and Barbara Spencer. 1985.

and Spencer results hold under Cournot (quantity) competition. Eaton and Grossman on the other hand showed that under Bertrand (price) competition the optimal strategic policy is an export tax[33]. Since these studies a great deal of literature emerged on the topic both elaborating and criticizing the theory.

This literature is surveyed by Brander[34] who states that:

> " One could imagine that the policy tool in question might be tariffs, quotas, voluntary export restraints, R&D subsidies or any one of a wide range of policy instruments that can alter the payoffs of oligopolistic firms. Furthermore, we have assumed nothing in particular about where the firms are located, who owns them, what firms' choice variable are, etc. (…) the basic insight that strategic interaction between firms creates an opportunity for government action to modify the terms of that interaction is very robust. The precise nature of the implied policy action is, however, very sensitive to the specifics of the underlying model structure." (p. 8)

After thus arguing that several theoretical elaborations and criticisms of the strategic trade policy are trivial Brander states that the theory is an application of non-cooperative game theory and that it can be summarized by using two models, namely the third market model where the firms of two countries compete in the market of a third country and the reciprocal market model where the firms compete in the markets of each other. The former model will be revisited in the fourth chapter; so the technical details of strategic trade policy are not presented here.

Leaving aside theoretical issues such as firm location, strategic trade policy is also debated from empirical and policy-oriented perspectives. Empirical studies of strategic trade policy[35] have used a method called calibration with rather lax assumptions; therefore they are not very robust. And policy-oriented debate has created two camps among economists

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"Export Subsidies and International Market Share and Rivalry". *Journal of International Economics,* Volume 19: pp. 83-100.

[33] Eaton, Jonathan and Gene Grossman. 1986. "Optimal Trade and Industrial Policy under Oligopoly". *Quarterly Journal of Economics,* Volume 101, Number 2: pp. 383406.

[34] Brander, James A. 1995. "Strategic Trade Policy". National Bureau of Economic Research Working Paper No. 5020. Available from the World Wide Web: <http://www.nber.org/papers/wp5020>. Published as: Brander, James A. 1995. "Strategic trade policy". in G. Grossman and K. Rogoff (eds.). *Handbook of International Economics, Volume III*. Amsterdam: North-Holland: pp. 1395-1455.

[35] See for example the studies in: Krugman, Paul and Smith, Alasdair (eds.) 1994. *Empirical Studies of Strategic Trade Policy*. Chicago: University of Chicago Press.

mirroring their theoretical work[36]. The main lines of criticism are informational problems about markets, effect on other domestic sectors, whether the trade policy is the first-best one or not, the possibility of capture by special interests (an issue studied below) and the impact of beggar-thy-neighbor policies.

Despite these criticism it is possible to find case studies which reveal that strategic trade policy does actually work well[37]. The most famous case study is that of Airbus conducted by Neven and Seabright[38]. These authors are not advocates of strategic trade policy; but they conclude that the European subsidies paid to Airbus that enabled it to enter the market for large commercial airliners were bad for the world economy as a whole, but beneficial to Europe (The gains of Airbus were smaller than the losses of the rival Boeing.).

Therefore it is not surprising to see that Seabright, this time accompanied by Besley, puts forward strategic trade policy as the most supportive one among the three theoretical explanations for the existence and impact of SAs in the EU in a seminal article on the topic[39].

According to the authors another such theoretical explanation lies in the literature on new economic geography that stems from Krugman's *Geography and Trade*[40]. This literature assumes that there are externalities caused by the location of economic activity. Therefore government action to arrange or rearrange location might be justified for internalizing these externalities.

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[36] See: Krugman, Paul (ed.). 1986. *Strategic Trade Policy and International Economics*. Cambridge, Mass./London: The MIT Press. Brander, Spencer, Thurow and Tyson's essays support the strategic trade policy approach while those of Dixit, Grossman, Eaton and Bhagwati oppose. Krugman takes a neutral stance as he is the editor; but in his further studies Krugman also becomes critical of strategic trade policy: "After several years of theoretical and empirical investigation, it has become clear that the strategic trade argument, while ingenious, is probably of minor real importance." See: Krugman, Paul. 1993. "The Narrow and Broad Arguments for Free Trade". *American Economic Review Papers and Proceedings,* Volume 83: p. 363.

[37] However one cannot be certain about the underlying motive of the government in question of course.

[38] Neven, Damien and Paul Seabright. 1995. "European Industrial Policy: the Airbus case". *Economic Policy* October 1995: pp. 313-358. See page 46 for the current situation.

[39] Besley, Timothy and Paul Seabright. 1999. "State aids: Making EU policy properly reflect geography and subsidiarity". *Economic Policy* April 1999: pp. 13-53. Also see the working paper version which is quite different in the presentation of the material: Besley, Timothy and Paul Seabright. 1998. *The Effects and Policy Implications of State Aids to Industry: An Economic Analysis*. Available from the World Wide Web: <http://europa.eu.int/comm/industry>.

[40] Krugman, Paul. 1991. *Geography and Trade*. Cambridge: MIT Press.

Besley and Seabright consider new economic geography separately because unlike strategic trade policy government subsidies might not be collectively sub-optimal. In fact it is not necessary to study new economic geography as a separate source of intergovernmental competition since the externalities involved (such as agglomeration externalities) are just of one specific type of the conventional literature. Furthermore as the authors state there are articles in the strategic trade policy literature which take into account locational effects[41]. However the same criticism is not valid for the third theoretical explanation put forward by the authors.

2.2.2.2. International Tax Competition

It is possible to conceive international tax competition from two different perspectives: as a surge in tax reform or as an efficient allocation of local public goods and corresponding tax rates, or in other words fiscal decentralization[42].

Besley and Seabright take this second view. They concentrate on the Tiebout tradition in the public finance literature (more specifically its fiscal federalism sub-branch that grew under the influence of the economist Wallace E. Oates [43]) based on Charles Tiebout 1956 article "A pure theory of local expenditures":

> " The Tiebout literature therefore emphasizes the benefits of decentralization in inducing citizens and firms to sort themselves into groups on the basis of their preferences for local public goods (…). Tiebout showed that competition between governments would lead to Pareto-efficient outcomes provided certain (stringent) conditions were met (…)." (p. 23).

So Tiebout line of reasoning supports intergovernmental competition from a collective perspective under certain conditions like the new economic geography literature and therefore opposes one of the main findings of strategic trade policy literature.

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[41] See for example: Bond, Eric and Larry Samuelson. 1986. "Tax holidays as signals". *American Economic Review,* Volume 76: pp. 820-826.

[42] For a study of these two perspective in a unified framework see: Brueckner, Jan K. 2003. "Fiscal Decentralization with Distortionary Taxation: Tiebout vs. Tax Competition". Available from the World Wide Web: <http://www.igpa.uiuc.edu/publications/workingPapers/WP97-decentralization.pdf> (This working paper has been published in 2004 in *Asia-Pacific Financial Markets,* Volume 11, Issue 2.).

[43] For a survey of fiscal federalism see: Oates, Wallace E. 1999. "An Essay on Fiscal Federalism". *Journal of Economic Literature,* Volume XXXVII: pp. 1120–1149. The same author's 1972 book *Fiscal Federalism* is the cornerstone of this literature.

The other perspective to international tax competition is more policy-oriented and has appeared as a result of decrease in tax rates following the beginning of the current process of globalization. However its theoretical roots are to be found in Tiebout and Oates. This literature is divided into two camps. On the one hand are those who argue that international tax competition creates a race-to-the-bottom that erodes state sovereignty and weakens public good provision and redistribution[44]. As a result tax policy coordination among governments can lead to welfare gains. On the other hand are those who believe that tax competition creates economic efficiency and therefore spurs economic growth[45]. One reason behind the efficiency gains is the so-called Leviathan behavior of governments[46].

A policy-oriented literature review by Schjelderup shows that the current difficulties faced by the empirical studies on tax competition do not enable the literature to reach a definitive answer[47]: "(...) taxes may fall, but it is not always a 'race to the bottom,' nor is a fall in tax rates always bad even when governments maximize the welfare of their own citizens." (p. 21).

Therefore international tax competition remains a valid justification for government intervention in the markets from both perspectives.

2.2.3. Political Economy

The term political economy does not encapsulate a set of studies on whose boundaries exist a general agreement by scholars. In the early days of the discipline it was simply used instead of the term economics. Hence David Ricardo's infamous treatise is titled *On the Principles of Political Economy and Taxation*. Today some understand political economy

[44] This group of studies originate from the model developen in the following article: Zodrow, George R. and Peter Mieszkowski. 1986. "Pigou, Tiebout, Property Taxation, and the Underprovision of Local Public Goods" *Journal of Urban Economics,* Volume 19, Number 3: pp. 356-370.

[45] See for example the following article: Edwards, Chris and Veronique de Rugy. 2002. "Chapter 3: International Tax Competition". in *Economic Freedom of the World: 2002 Annual Report*. Vancouver: Frazen Institute: pp. 43-58.

[46] This behavior characterized by a tendency to over-tax is first defined in the following: Brennan, G. and J. Buchanan. 1980 *The Power to Tax: Analytical Foundations of a Fiscal Constitution*. Cambridge: Cambridge University Press.

[47] Schjelderup, Guttorm. 2002. "International Tax Competition: Is it Harmful, and if so, What are the Policy Implications?" The Globalisation Project Report No. 10. Norway: Norwegian Ministry of Foreign Affairs.

as the application of economic models to politics and others as the study of interaction between economics and politics. Moreover most authors in the latter group prefer different approaches to the main questions posed. This study takes into consideration a hardcore economic approach explained by an author as follows[48]:

> "This literature is characterized by two features. First, it chiefly aims at explaining actual economic policies, rather than taking it as exogenous, as do 'conventional economics.' Second, it departs from the assumption often made in conventional economics that policy is determined by maximizing a social welfare function. It explicitly takes into consideration that policy is determined by a political mechanism and therefore will reflect the interests of the most powerful groups in society." (p. 915)

The Public Choice school (or theory), which is developed by James Buchanan and Gordon Tullock in their classical 1962 study *The Calculus of Consent: Logical Foundations of a Constitutional Democracy*, is the most well-known tradition within political economy[49]. This school (or research program as Buchanan himself prefers) explains the formation of government policies under the influence of private interests.

Accordingly private interest holders carry out directly unproductive profit-seeking activities that can be policy-exogenous which take policy as given and try to redistribute the resulting rents or policy-endogenous which seek to influence the policies themselves through lobbying. (Successful) policy-endogenous activities are more costly; because (1) lobbying requires resources that can otherwise be utilized for productive purposes and (2) the resulting policy creates distortions that decrease social welfare.

Private interest holders can influence policy outcomes because politicians are not social welfare maximizers, but seekers of re-election. They supply demanded policies in exchange for political support and/or contributions, i.e. a political market that functions like other markets exists. Bureaucrats are also suppliers; but what they seek are greater budgets and competences[50].

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[48] Saint-Paul, Gilles. 2000. "The 'New Political Economy': Recent Books by Allen Drazen and by Torsten Persson and Guido Tabellini". *Journal of Economic Literature,* Volume XXXVIII: pp. 915-925.

[49] For an introduction to Public Choice see: Gunning, J. Patrick. 2003. *Understanding Democracy*: *An Introduction to Public Choice*. Taiwan: Nomad Press.

[50] Winters, Alan. 1991. *International Economics*. London: Routledge: pp. 160-169.

* * *

Almost every field in economics has a political economic projection; so it is not possible to evaluate all such studies here. Taking into consideration the topic of the present study, a policy that regulates trade-distorting production subsidies in the context of a regional economic integration grouping, reviewing the political economy of trade policy literature is sufficient[51]. This literature consists of three types of studies: structural, sectoral and policy-making[52].

The first type is structural studies explaining shifts in trade policy by structural changes in the economy. "Shift in comparative advantage" and "hegemonic decline" arguments for the rise of so-called new protectionism in advanced industrialized countries are examples[53].

The second type of studies is the sectoral ones. They seek to uncover the properties of those sectoral interests that are favored (usually protected in international trade literature). Factors such as level of employment, average skill levels of the employed, import penetration and geographical concentration are taken into consideration[54].

The final type of studies in the political economy of trade literature tries to explain the policy-making process. These studies either try to explain the characteristics of the political system or model the process itself. The latter explicitly use ideas stemming from the Public Choice school.

Some of these policy-making models are briefly presented below. Since a tariff is the basic instrument used in trade policy most of the models concentrate on tariffs; but their results can be generalized to include subsidies.

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[51] For a detailed review see: Akman, M. Sait. 2000. *Political Economy of Protectionism and the World Trade Organization: A "Public Choice" Approach to Trade Policies of the EU and the US*. Unpublished Ph.D Thesis. Marmara Üniversitesi Avrupa Topluluğu Enstitüsü: pp. 58-95.

[52] *Caveat lector*: original classification.

[53] Akman, M. Sait. *op. cit.*: p. 3.

[54] Anderson, Kym and Robert E. Baldwin. 1987. "The Political Market for Protection in Industrial Countries" in El-Agraa, Ali M. (ed.). *Protection, Cooperation, Integration and Development*: *Essays in Honour of Professor Hiroshi Kitamura.* London: Macmillan Press: pp. 20-36.

The first model by Mayer is based on direct democracy[55]. According to the model the level of tariffs is determined by majority voting among the citizens of a country. Therefore the preference of the median voter becomes the policy and provided that the preferences are single-peaked the utility of the median voter is maximized[56].

Alesina and Rodrik have advanced this model and showed that if voters differ in relative factor endowments and the median voter owns a lower capital-labor ration than overall economy import tariffs would be given to labor intensive imports and import subsidies to capital intensive imports[57].

Mayer's direct democracy model of trade policy is a neat one; but it is not realistic since trade policy is not determined by referenda and import subsidies do not exist[58].

Other political economic models of trade policy are based on interest holder activity[59]. One such model is the tariff formation function model by Findlay and Wellsiz[60]. In this model the level of tariffs is linked to the level of lobbying carried out by the conflicting interest holders. In a given sector producers lobby for protection while consumers lobby for free trade, i.e. there are two lobbies. Each group j in the sector i maximize the following objective function where W stands for welfare, T stands for tariffs and C stands for contributions:

$$W_i^j[T_i(C_i^P, C_i^F)] - C_i^j$$

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[55] Mayer, Wolfgang. 1984. "Endogenous tariff formation". *American Economic Review* 74: pp. 970-985.

[56] For median voter theorem and associated issues in political decision-making see: Hinich, Melvin J. and Michael C. Munger. 1997. *Analytical Politics.* USA: Cambridge University Press.

[57] Alesina, Alberto and Rodrik, Dani. 1994. "Distributive Politics and Economic Growth". *Quarterly Journal of Economics,* Volume 109, Number 2: pp. 465-490.

[58] On the contrary Alesina and Rodrik argue that majority voting is an analytical tool used "to capture the basic idea that any government is likely to be responsive to the wishes of the majority when key distributional issues are at stake". Dutt and Mitra even find empirical support favoring Mayer's theory: Dutt, Pushan and Devashish Mitra. 2002. "Endogenous trade policy through majority voting: an empirical investigation". *Journal of International Economics* 58: pp. 107-133. Mayer's model is indeed useful; but the progress of scientific knowledge requires increasingly realistic models as well as robustness of results.

[59] This study uses the term interest holder instead of interest group because sometimes government policy can be conceived to be designed to serve the interests of a single interest as in the Airbus case (See page 23 above).

[60] Findlay, Ronald and Stanislaw Wellisz. 1982. "Endogenous Tariffs, the Political Economy of Trade Restrictions and Welfare" in J. N. Bhagwati (ed). *Import Competition and Response*. Chicago: University of Chicago Press: pp. 223-228.

Nash equilibrium in the lobbying strategies of the interest holders determines the tariff level. This is a more realistic model of political decision-making; but the supply side is not taken into consideration, i.e. the objective function of the government is not clarified.

Another interest holder model, the political support function of Hillman studies the supply side[61]. Here the government takes into consideration both lobbying activity and the general welfare; so the objective function of the government trades off gains of the lobby against the losses of the consumers. Different weights can be attached to welfares of these groups. However Hillman model is weaker on the demand side compared to Findlay and Wellsiz model since the lobbies are not allowed to compete for protection.

Magee, Brock and Young tried to build a model that studies both demand and supply at the same time[62]. The model is based on electoral competition. There are two parties representing two opposing interests, capital and labor. The interest holders make contributions in order to increase the probability of the party they support winning the election. They maximize the expected income of the factors of production they represent minus contributions. In the case of capital lobby this can be shown by the below formula,

$$\max_{C_K}[qr_K + (1-q)r_L]K - C_K$$

where p is the probability that the pro-capital party is in power, r_K (r_L) is the rental rate when pro-capital (pro-labor) party is in power and C_K is the capital lobby's campaign contributions.

Magee, Brock and Young's model (although somewhat naïve compared to models used by political science) provides a more sophisticated political analysis by combining the core ideas in the previous studies cited above through the addition of political parties and elections.

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[61] Hillman, Arye L. 1982. "Declining Industries and Political-Support Protectionist Measures". *American Economic Review* 72: pp. 1180-1187. The model is presented in a more detailed way in: Hillman, Arye L. 1989. *The Political Economy of Protection*. New York: Harwood Academic. Another study that uses a political support function is: Long, Ngo Van and Vousden Neil. 1991. "Protectionist Responses and Declining Industries". Journal of International Economic 30: pp. 87-103.

[62] Magee, Stephen P., William A. Brock and Leslie Young. 1989. *Black Hole Tariffs and Endogenous Policy Theory: Political Economy in General Equilibrium*. Cambridge: Cambridge University Press.

However it is the Grossman-Helpman model that has dominated the literature ever since its publication[63]. Grossman and Helpman build on Magee, Brock and Young's model. In their study lobbying is carried out not to influence election outcomes, but trade policy. This is a more realistic approach and especially fits with the political action committee system in the United States that the authors have in mind[64].

Moreover Grossman and Helpman model the interaction between several lobbying groups as well. Organized interests play a non-cooperative game with two stages called a common agency game that has the structure of a menu auction. First each interest non-cooperatively sets a contribution schedule and then the government sets trade policy and collects contributions (Contribution function is binding.). The government is a semi-benevolent one maximizing a weighted sum of social welfare and contributions,

$$G = \sum_{i=L} C_i(p) + \alpha W(p)$$

where p is the domestic price vector (the trade policy) and α is the weight attached to social welfare.

Grossman and Helpman showed that their results also hold in a context of electoral competition as in the Magee, Brock and Young's scenario. Parties that are competing for seats in a legislature maximize the same objective function[65].

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[63] Grossman, Gene M., and Helpman, Elhanan. 1994. "Protection for Sale". *American Economic Review,* Volume 84, Number 4: pp. 851-874. The model is presented in a more detailed way in: Grossman, Gene M., and Helpman, Elhanan. 2001. *Special Interest Politics*. Cambrigde: MIT Press. Also see the following study that places the original model in a larger context: Schleich, Joachim. 1997. *Essays on the Political Economy of Domestic and Trade Policies in the Presence of Production and Consumption Externalities*. Unpublished PhD Thesis. Virginia Polytechnic Institute and State University. Available from the World Wide Web: <http:// scholar.lib.vt.edu/theses/available/etd-8497-153354>.

[64] A political action committee (PAC) is a specific type of organized interest group that is formed to financially support the electoral campaigns of politicians in United States where there are strict rules on campaign finance. PACs are specific to United States politics; so the universal applicability of Grossman-Helpman model can be questioned. Furthermore there are other ways of lobbying such as informational or militant lobbying that are not taken into consideration in the current version of the model. However the model is suitable to allow for such modifications.

[65] Grossman, Gene M., and Helpman, Elhanan. 1996. "Electoral Competition and Special Interest Politics." *Review of Economic Studies* 63: pp. 265-286. In fact the model in this article is more advanced that the Magee, Brock and Young's scenario since the parties are not simply competing for winning the election, but for the number of seats.

Grossman-Helpman model has several advantages compared to the previous studies: (1) strong microeconomic foundations, (2) applicability to other economic issues and (3) suitability for statistical testing.

The authors applied their model to international trade negotiations[66] and formation of free trade areas[67]. It has also been applied to the issue of environmental externalities[68]. In general it can be applied to any redistributive issue.

Two studies carried out statistical testing of the Grossman-Helpman model using slight modifications and different methodologies. Both Goldberg and Maggi and Gawande and Bandyopadhyay found support for the model[69]. One interesting observation is that the weight attached to social welfare turns out to be far greater (in fact too greater) than that attached to contributions.

Political economic models of international trade policy of which some prominent ones are reviewed above, might not have been perfected yet; but they are useful for understanding the discrepancies between what is expected by the conventional economics and what is actually observed in economic life. Therefore they present an explanation, but not necessarily a justification for government intervention in the markets.

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[66] Grossman, Gene M., and Helpman, Elhanan. 1995. "Trade Wars and Trade Talks". *Journal of Political Economy,* Volume 103: pp. 675-708.

[67] Grossman, Gene M., and Helpman, Elhanan. 1995. "The Politics of Free Trade Areas". *American Economic Review,* Volume 85, Number 4: pp. 835-850.

[68] Aidt, Toke S. 1998. "Political Internalization of Economic Externalities and Environmental Policy". *Journal of Public Economics,* Volume 69: pp. 1-16.

[69] Goldberg, Pinelopi Koujianou and Giovanni Maggi. 1999. "Protection for Sale: An Empirical Investigation" *American Economic Review,* Volume 89: pp. 1135-1155; Gawande, Kishore and Usree Bandyopadhyay. 2000. "Is Protection for Sale? Evidence on the Grossman-Helpman Theory of Endogenous Protection". *Review of Economics and Statistics,* Volume 82: pp. 139-152. Naturally these studies test the model in the United States setting.

2.3. Subsidies as a Tool of Government Intervention

2.3.1. Defining Subsidies

Governments are faced with an abundance of tools that can be utilized to intervene in the markets. For example in order to protect a domestic industry from international competition tariffs, quotas, voluntary export restraints, technical barriers (such as standards) et cetera can be used. For protecting the environment from the harmful effects of a polluting industry allocation of property rights, marketable emission permits, taxes and direct regulation are among the available instruments.

Subsidies are among these tools[70]. A subsidy can basically be defined as a negative tax[71]. However this definition is circular and does not do justice to this complicated government tool. Subsidies can (1) come in various forms (grants, loans, guarantees et cetera), (2) be directed to different economic activities (consumption, production and sales as in export subsidies) (3) in multiple ways (for example in the case of production subsidies input, per unit output, investment et cetera), (4) be used for a wide range of policy purposes and (5) have different welfare effects. Therefore a more functional definition is necessary to begin the analysis of subsidies[72].

One commonly used definition with slight variations is the following[73]: "A subsidy is any measure that keeps prices for consumers below the market level or keeps prices for producers above the market level, or that reduces costs for consumers and producers by giving direct or indirect support." This definition is a sensible one capturing the fact that all subsidies have price impacts. However it is basically equivalent to the "negative tax" definition and therefore does not improve one's understanding of subsidies. Moreover it is

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[70] Even though there are many studies on or related to subsidies only those by the International Monetary Fund are comprehensive. See footnote 84.

[71] Begg, David, Stanley Fischer and Rudiger Dornbusch. *op. cit.*: p. 49.

[72] Various legal definitions are available under different instruments of law; but these are of no particular use here since legal definitions are constructed to reflect the empirical world through the lenses of regulation and therefore limited with those aspects that the decision-maker desires to regulate or the judge desires to settle. The definition of SAs in the EU (explained in the next chapter) is a perfect example.

[73] Moor, André de and Peter Calamai. 1997. *Subsidizing Unsustainable Development: Undermining the Earth with Public Funds*. Canada: Earth Council & Institute for Research on Public Expenditure: p. 1. This study develops a framework to evaluate subsidies and applies it to key sectors.

not sensitive enough to distinguish subsidies from other forms of government intervention in the markets such as direct provision of public goods.

Another definition is as follows[74]:

> " Subsidies are direct or indirect payments or other privileges granted by a government or one of its agents to private firms without a market-like quid pro quo. Instead, the firms concerned are expected to display a certain change of behavior (or a continuity of behavior otherwise not planned) which assists in the accomplishment of political objectives."

This definition is superior to the previous definitions because of a number of reasons. First of all, the SA policy of the EU is basically employed with trade-distorting production-related subsidies (versus pure consumption subsidies) and therefore this definition serves the purposes of the present study. Second, it emphasizes the fact that subsidies operate outside the market mechanism, an issue that is crucial in analyzing the economic impacts of subsidies. Finally, it also allows subsidies to be completely in public interest or completely in private interest. In the former case a subsidy would be compensation and in the latter a "present"[75]. Of course the impact of a subsidy can be anywhere on the continuum between these two extremes. This is an important qualification: A subsidy might be distortive after a certain limit.

2.3.2. Subsidies in the Context of International Trade

Taking into consideration the aim of the SA policy it is sufficient to keep the analysis of subsidies within the international trade literature. There are two types of production-related subsidies used in trade policy: production and export subsidies[76].

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[74] Hansmeyer, K. H. 1977. "Transferzahlungen an Unternehmen (Subventionen)" in *Handbuch der Finanzwissenschaft, 3rd ed., Vol. I.* Tübingen: p. 960; as quoted in: Ewringmann, Dieter, Michael Thöne and Hans Georg Fischer. 2002. *European Aid Control and Environmental Protection: Evaluation of the New Community Guidelines on State Aid.* Berlin: Federal Ministry for the Environment, Nature Conservation and Nuclear Safety: p. 9.

[75] Ewringmann, Dieter, Michael Thöne and Hans Georg Fischer. *op. cit.*: p. 9. The endorsement of the term "present" by the authors represents the official nature of the publication.

[76] The discussion of these subsidies are based on the following: Seyidoğlu, Halil. 2001. *Uluslararası İktisat: Teori Politika ve Uygulama.* İstanbul: pp. 178-182; Krugman, Paul A. and Maurice Obstfeld. 1991. *International Economics: Theory and Policy, Second Edition.* Addison-Wesley: pp. 188-194.

Figure 2.7

An Import Substituting Production Subsidy

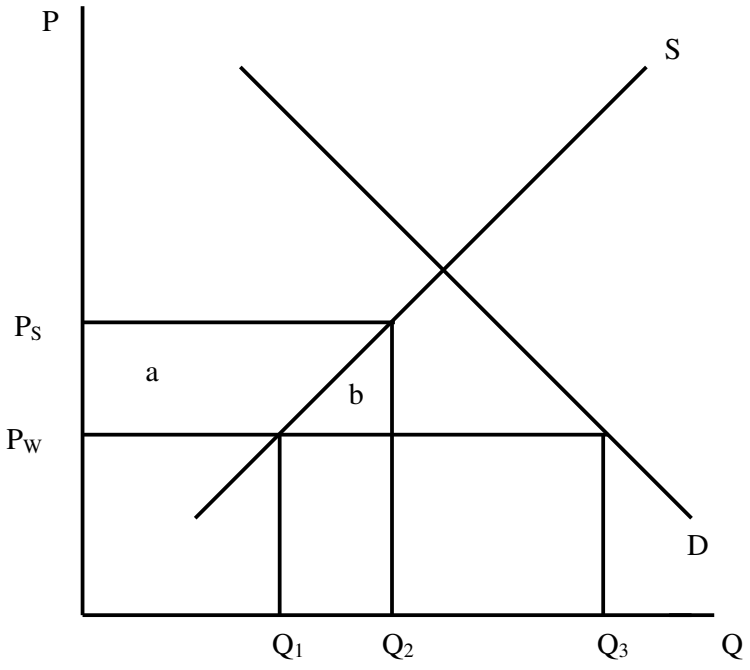


Figure 2.8

An Export Creating Production Subsidy

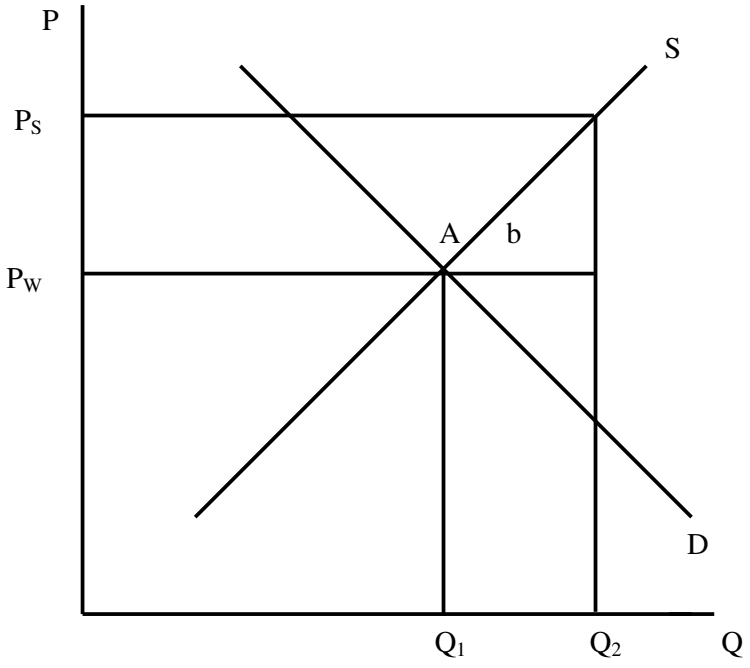
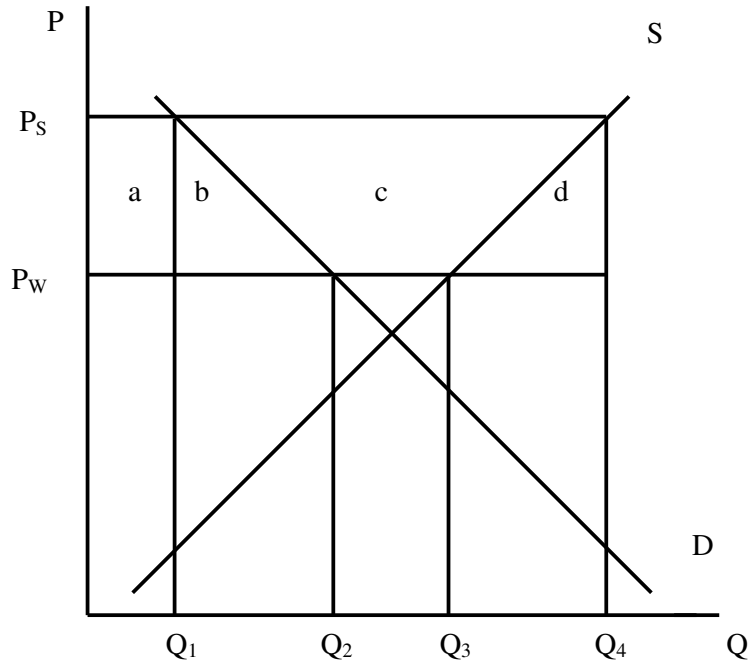


Figure 2.9

An Export Subsidy



Production subsidies might have two different impacts given the initial situation in the economy of the subsidizing government: import substitution or export creation.

Figure 2.7 above illustrates an import substituting production subsidy in the case of a "small" country under perfect international markets (In the case of a "large" country terms of trade effects are also present.). World price is P_W. At this price domestic production equals to $0Q_1$ and Q_1Q_4 is the level of imports. Domestic government decides to give a subsidy that increases the producer price (the price received by the producers) from P_W to P_S. The consumer price remains unchanged. Domestic production increases to $0Q_2$ and the level of imports decreases to Q_2Q_3.

The total budgetary impact of the subsidy equals to the area given by (a + b). However the increase in producer surplus equals just to a. The area b shows a production deadweight (or distortion) loss.

Figure 2.8 shows an export creating domestic subsidy. It is assumed that the world price and the autarky price (the domestic price in a country when there is no trade) are equal to each other at the domestic equilibrium A. Therefore no international trade exists prior to the subsidy. Domestic production and consumption are equal: $0Q_1$. Domestic government decides to give a subsidy that increases the producer price from P_W to P_S. The consumer price and so the level of domestic consumption remains unchanged. Therefore an excess supply of Q_1Q_2 is created that can be exported to the rest of the world. The welfare analysis does not change as the area b shows a deadweight loss.

Export subsidies are different from export creating production subsidies since they are given for the export activity, not the production activity. An export subsidy is illustrated in Figure 2.9 above. At the world price domestic consumers demand $0Q_2$ and domestic producers answer this demand and export Q_2Q_3. Domestic government decides to give an export subsidy that increases the producer price from P_W to P_S for exports. Therefore producers restrict their supply to domestic consumers with $0Q_1$ and export Q_2Q_3. The budgetary impact of the subsidy equals to (b + c + d). The area a is not part of the subsidy since $0Q_1$ is not exported. The resulting producer surplus equals to (a + b + c). The area d is a production deadweight loss and the area b is a consumption deadweight loss.

2.3.3. The Optimal and Actual Use of Subsidies

The basic analysis above clearly shows that production-related subsidies used in trade policy reduce welfare since they entail deadweight losses.

However if the markets are not efficient and government intervention is justified such subsidies might not reduce, but enhance welfare. Of course as stated in the beginning of the section there are many tools that a government can use for intervening in the markets. It is the theory of domestic distortions that explain whether or not a subsidy is the optimal tool for intervention[77].

[77] Bhagwati, Jagdish and V.K. Ramaswami. 1963. "Domestic Distortions, Tariffs and the Theory of Optimum Subsidy". *Journal of Political Economy* 71 (1): pp. 44-50; Johnson, Harry G. 1965. "Optimal Trade Intervention in the Presence of Domestic Distortions" in R. E. Caves, H. G. Johnson and P. B. Kenen (eds.). *Trade, Growth and the Balance of Payments*. Amsterdam: North-Holland Publishing Company; Corden, Max. 1989. *Trade Policy and Economic Welfare*. Oxford: Clarendon Press: pp. 9-33. Corden

According to this theory an optimal government intervention should directly target the source of the market imperfection creating inefficiency (the targeting principle). Such a instrument is called a first-best one. If a policy tool approaches the imperfection indirectly then it would create a by-product distortion, i.e. while correcting an imperfection it will create another one. Such instruments are in general called second-best even though the actual ranking of the instrument in the hierarchy of policies is given by the number of by-product distortions it creates plus one.

In the context of trade policy, subsidies are almost always welfare superior to other conventional trade policy tools, especially tariffs. For example if the market imperfection is caused by a production externality then a production subsidy would target this margin directly. A tariff, on the other hand, would work through the consumer prices affecting two margins and creating a by-product distortion.

However there are different types of subsidies and their rankings in the hierarchy of policies can be different. Corden gives the following example[78]: "(...) the wage that an industry has to pay for its labor may exceed the social opportunity cost of this labor. Other industries are assumed to face no such divergence." In this case a production subsidy would not be first-best; because it affects not only labor costs, but all of the costs of the industry. The first-best policy is a wage subsidy.

Furthermore a subsidy can only be the first-best tool for government intervention if there are no distortions related to its financing. Subsidies financed by lump-sum taxes are not distortive; but in real life distortionary taxation prevails. Moreover even if taxes are lump-sum there are others problems of public finance such as collection costs. This does not necessarily mean that another first-best policy tool is available. Instead governments have to operate in a second-best setting.

One implication of this setting is that if the marginal social cost of funds is high enough a tariff would be welfare superior to an otherwise first-best subsidy. Such a situation might

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uses the term divergence instead of distortion. According to him a distortion is a specific type of divergence caused by government intervention in the market (pp. 13-14.).

[78] Corden, Max. *op. cit.*: p. 21.

arise when the government faces a tight budget constraint or when it lacks the administrative capacity to raise revenue from other sources.

Legal constraints and political economic considerations can also lead governments to use non-optimal tools in interventions[79]. Indeed there are many studies especially in environmental economics and also in law & economics literatures addressing the question of instrument choice from both economic and political economic perspectives. Political economic explanations have been favored since late 1990s[80].

What these studies show us is that not only the government intervention in the markets, but also the choice of policy tool used for this purpose might be shaped by political economic reasons instead of reasons of efficiency.

Therefore it is not surprising to find out that most of the subsidies given by governments are evaluated to be distortive. Indeed cutting down subsidies to their optimal levels (which can be zero) is considered as one of the most important challenges in the current global economy. Even though a specific study on subsidies does not exist computable general equilibrium models of general trade liberalization (in the post-Uruguay Round environment) generate global welfare gains ranging from 254 billion USD for the liberalization of trade in goods to 2,080 billion USD to liberalization of goods, services and foreign direct investment of which some would be caused by the elimination of distortive subsidies[81]

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[79] The existence of legal constraints is not an excuse for using second-best tools from a strictly economic perspective since legislation can be amended to overcome them.

[80] For a review of environmental economics literature with a good discussion on this question see: Cropper, Maureen L. and Wallace E. Oates. 1992. "Environmental Economics: A Survey". *Journal of Economic Literature,* Volume XXX: pp. 1675-740. For a study that aims to present a unified framework for economics, political science and law literatures based on the metaphor of a political market see Keohane, Nathaniel O., Richard L. Revesz and Robert N. Stavins. 1997. "The Positive Political Economy of Instrument Choice in Environmental Policy". Discussion Paper 97-25. Washington: Resources for the Future. This study is published in: Panagariya, A., P.R. Portney and R.M. Schwab (eds.). 1999. *Environmental and Public Economics: Essays in Honor of Wallace E. Oates*. UK, Cheltenham: Edward Elgar. For a review of the political economy of environmental policy see: Oates, Wallace E. and Paul R. Portney. 2001. "The Political Economy of Environmental Policy". Discussion Paper 01-55. Washington: Resources for the Future.

[81] Anderson, Kym. 2004. "Subsidies and Trade Barriers". Copenhagen Consensus Challenge Paper. Available from the World Wide Web: <http://www.copenhagenconsensus.com>. The models Anderson review have differences in aspects such as market assumptions and baseline years; but they all show that trade liberalization would be gainful for the global economy.

Furthermore leaving aside the loss of economic welfare caused by trade-distortion it is widely argued that most subsidies are also directly or indirectly harmful for the society and the environment. However econometric models do not take into consideration dynamic social and environmental gains of subsidy elimination.

These harmful subsidies are concentrated in the following seven sectors listed according to their shares of the subsidies in 2001 : agriculture (38 %), energy (22 %), road transport (21 %), water (6 %), forestry (3 %), mining (3 %), and fisheries (2 %)[82,83].

A popular term that originates from environmentalist publications and used by some economists to define these distortive subsidies is "perverse". Table 2.1 below gives the most recent comparative estimates for perverse subsidies in six sectors[84].

For a more general approach on subsidies and subsidy reform from a public finance perspective one has to consult the publications of International Monetary Fund economists[85].

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[82] Beers, C. van and André de Moor. 2001. *Public Subsidies and Policy Failures: How Subsidies Distort the Natural Environment, Equity and Trade and How to Reform Them.* Cheltenham, UK: Edward Elgar; as quoted in Anderson, Kym. *op. cit.*: p. 12.

[83] Various studies exist on agricultural and energy subsidies; but road transport subsidies seems to be relatively neglected. For a general review see: Moor, André de and Peter Calamai. *op. cit.* For agricultural subsidies see (This study gives reference codes of official documents, if any in citations. When reference codes include year of the document date is not indicated separately.): Organization for Economic Cooperation and Development. COM/AGR/TD/WP(2002)19/FINAL. "Agricultural Policies in the OECD Countries: A Positive Reform Agenda". Paris. For energy subsidies see: United Nations Environment Programme & International Energy Agency. 2002. *Reforming Energy Subsidies*. Oxford, UK. Fisheries subsidies have become a major source of debate in the current round of multilateral trade negotiations. On this subject see: Porter, Gareth. (No date given.) *Fisheries and the Environment Vol I: Fisheries Subsidies and Overfishing: Towards a Structural Discussion*. Geneva: United Nations Environment Programme. These sources are just selections. Several intergovernmental organisations, governmental agencies, research centers and non-governmental organisations produce usually policy-oriented publications on issues related to subsidies.

[84] Myers, Norman and Jennifer Kent. 2001. *Perverse Subsidies: How Tax Dollars Can Undercut the Environment and the Economy*. International Institute for Sustainable Development. The authors erroneously accept externalities caused by subsidies as perverse subsidies too. This can be seen as an act of demagogy since like many of the non-official publications on environmental issues this book is lobbying-oriented. In order to correct the error the column titled "externalities documented/qualified" is taken out the table. Perverse subsidies are adjusted accordingly (Externalities were accepted as 100 % perverse.) and percentages are calculated. The monetary amounts given for externalities in billion USDs were as follows: 250 for agriculture, 200 for energy, 380 for road transportation, 180 for water, 78 for forestry and none for fisheries.

[85] Clements, Benedict, Réjane Hugounenq and Gerd Schwarts. 1995. "Government Subsidies: Concepts, International Trends and Reform Options." International Monetary Fund Working Paper No. WP/95/91. Washington; Clements, Benedict, Hugo Rodríguez and Gerd Schwarts. 1998. "Economic Determinants of Government Subsidies". International Monetary Fund Working Paper No. WP/98/166. Washington;

Table 2.1

Current Estimates of Perverse Subsidies

(billion USD)

Sector	Conventional subsidies* (a)	Perverse subsidies** (b)	$\frac{(a)}{(b)} x100$
Agriculture	385	260	68
Energy	131	100	77
Road transportation	800	400	50
Water	67	50	75
Forestry	25	25	100
Fisheries	14	14	100
Total	1.420	918	65

* Original figures given by the authors.

** Not including the figures given by the authors for externalities.

Source: Adapted from: Myers, Norman and Jennifer Kent. 2001. *Perverse Subsidies: How Tax Dollars Can Undercut the Environment and the Economy*. International Institute for Sustainable Development: p. 188.

Schwarts, Gerd and Benedict Clements. 1999. "Government Subsidies". *Journal of Economic Perspectives*, Volume 13, Number 2: pp. 119-147. The Organization for Economic Cooperation and Development carries out research in measurement of subsidies, especially in the agricultural sector. See footnote 83.

2.4. Multilateral Regulation of Subsidies

Given the trade and also the non-trade distortions created by the actual use of subsidies it is not surprising to see that governments have acted cooperatively, albeit to a certain degree, in order to limit their use. Multilateral regulation of subsidies is the outcome of this cooperation.

Indeed the SA policy of the EU is one such cooperation mechanism on subsidies. Since the EC is a single entity in international trade and it has exclusive competence both in trade and competition policies (as explained in the next chapter) multilateral regulation of subsidies forms the outer ring of the SA policy. Therefore a brief review of those multilateral regulations the EU has adhered to would be appropriate here.

2.4.1. World Trade Organization Agreements

Towards the end of the Second World War the Allied Powers decided to build a new international political and economic order that would ensure world peace. General Agreement on Tariffs and Trade (GATT) was signed in 1947 as a part of this project. GATT provided a general legal basis for international trade and progressive liberalization thereof. This legal order was reinforced by supplementary agreements and understandings as well as a *de jure* organizational setup by the World Trade Organization (WTO) Agreement that was signed at the end of the Uruguay Round of multilateral trade negotiations[86].

GATT Article XVI includes basic provisions on subsidies that were detailed by the "Subsidies Code" signed at the end of the Tokyo Round of multilateral trade

[86] For basic information on GATT and WTO see: World Trade Organization. 2003. *Understanding the WTO, 3rd Edition*. Geneva. For the historical development of the GATT system with a focus on the Uruguay Round see: Jackson, John H. 1990. *Restructuring the GATT System*. London: The Royal Institute of International Affairs; Hoekman, Bernard and Michel Kostecki. 1995. *The Political Economy of the World Trading System: From GATT to the WTO*. Oxford University Press. For an evaluation of the Uruguay Round of multilateral trade negotiations see: Schott, Jeffrey J. 1994. *The Uruguay Round: An Assessment*. Washington, D.C.: Institute for International Economics. For an economic analysis of the GATT system especially see: Bagwell, Kyle and Robert W. Staiger. 1999. "An Economic Theory of GATT". *American Economic Review*: pp. 215-248; Bagwell, Kyle and Robert W. Staiger. 2002. *The Economics of the World Trading System*. Cambridge: MIT Press.

negotiations[87]. Under these rules governments were able to use countervailing duties (CVDs) against export subsidies that caused material injury in their import competing industries for products whose tariff levels were bound. Governments were also able to make claims for their market access rights against import substituting production subsidies. However these rules lacked an effective enforcement mechanism. The signatories of GATT remained almost completely free for using production subsidies[88].

The weakness of the rules on subsidies had created a frustration among the signatories that was reflected in the Uruguay Round (In general the Uruguay Round witnessed a shift of focus from border measures such as tariffs to domestic measures and legal systems.). Despite the frustration it was still very difficult to reach a consensus on the question of subsidies. The outcome of the negotiations was two separate agreements, one being general and other sectoral, that by no means ended the debates surrounding the issue, but still created a major achievement[89].

The general agreement is the Agreement on Subsidies and Countervailing Measures (ASCM, sometimes called the SCM Agreement). According to the definition provided by ASCM a subsidy has two elements: (1) being a financial contribution by a government or any public body within the territory of a Member of WTO, (2) conferring a benefit on the subsidized party. Only those subsidies that are specific are covered by the Agreement[90].

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[87] The official name of the Subsidies Code is the Agreement on Interpretation and Application of Articles VI, XVI and XXIII of the General Agreement on Tariffs and Trade. For the texts of Tokyo Round agreements see: http://www.worldtradelaw.net/tokyoround/index.htm.

[88] Bagwell, Kyle and Robert W. Staiger. 2004. "Subsidy Agreements". National Bureau of Economic Research Working Paper No. 10292. Available from the World Wide Web: <http://www.nber.org/papers/wp10292>: pp. 18-19.

[89] Collins, Terry and Gerry Salembier. 1996. "International Disciplines on Subsidies: The GATT, The WTO and the Future Agenda". *Journal of World Trade,* Volume 30, Number 1: p. 12; Schott, Jeffrey J. *op. cit.*: p. 12; Steger, Debra P. 2003. "The WTO Doha Round Negotiations on Subsidies and Countervailing Measures: Issues for Negotiators". Symposium on Economic Restructuring in Korea in Light of the Doha Development Round Negotiations on Rules. Available from the World Wide Web: <http://www.iibel.adelaide.edu.au/docs/StegerSubsidiesSpeechKITA.pdf>: pp. 1-2. For the texts of Uruguay Round agreements and other official documents see: http://www.worldtradelaw.net/uragreements/index.htm.

[90] The justification is as follows:

> "It is acknowledged that government subsidies that distort the efficient allocation and utilization of resources within an economy should be subject to multilateral disciplines. When a subsidy is available on a wide basis to a broad group of enterprises or industries, such distortions are not considered to exist."

See: Steger, Debra P. *op. cit.*: p. 4

ASCM lists three types of specificity: enterprise, industry and regional. The Agreement categorizes subsidies based on specificity, impact and purpose. The metaphor of traffic light is unofficially used to describe this categorization. Accordingly non-specific subsidies are green-light subsidies (In fact these subsidies do not form a legal category since they are not covered by the ASCM). Red-light subsidies are those prohibited by the ASCM: export subsidies and local content subsidies (These are by definition specific.). Yellow-light subsidies are not prohibited, but they are actionable by other governments, that is they can be subject to CVDs. ASCM also included a provision that granted non-actionable status to research and development (R&D) subsidies, regional development subsidies and environmental conservation subsidies making them green-light subsidies; but this provision lapsed in 1999 and has not been extended by the relevant WTO Committee[91].

The sectoral agreement related to subsidies is the Agreement on Agriculture (AoA). Agricultural subsidies are subject to this Agreement. General rules laid down by ASCM are applicable when there are no specific provisions in the AoA. According to AoA agricultural export subsidies are not prohibited, but they were gradually reduced within limits. They can also be subject to CVDs. Regarding domestic support subsidies, the issue that deadlocked and prolonged the Uruguay Round, the AoA lays down a three-fold classification unofficially described by using a metaphor of three boxes. Accordingly the amber box includes those subsidies that distort production and trade, such as price support. A *de minimis* level was determined for them and those Members that had higher levels of subsidization had to gradually reduce their subsidies to those levels. Support exceeding reduction commitment levels is currently prohibited. The blue box covers those subsidies that would normally be included in the former box, but were made less distorting with the imposition of additional conditions in order to limit production. Finally, the green box includes the subsidies that do not distort or minimally distort production and trade. These are either horizontal subsidies or direct income support measures. There are no limits on

[91] For a discussion of ASCM see: Collins, Terry and Gerry Salembier. *op. cit.*; Steger, Debra P. *op. cit.* According to Bagwell and Staiger ASCM made three improvements regarding domestic subsidies compared to the Tokyo Round Subsidies Code: (1) A production subsidy successfully challenged under the ASCM must be removed; (2) there is no distinction between old and new subsidies in the ASCM; (3) a government that challenges a subsidy under ASCM does not have to negotiate a tariff commitment previously. See: Bagwell, Kyle and Robert W. Staiger. *op. cit.*: pp. 31-32.

the blue and green boxes. AoA also includes special and differential treatment provisions for the developing countries (Sometimes conceived as a separate box.)[92].

One of the major improvements in the GATT system following the Uruguay Round is the new rules and procedures on the settlement of disputes[93]. The panel and Appellate Body reports issued as a result of disputes clarified and elaborated several aspects of the WTO Agreements and thus created a new body of case law.

For example the concept of benefit employed in the ASCM, which is very ambiguous, required clarification. The Appellate Body ruled in 2000 in the famous case of tax treatment of Foreign Sales Corporations in the United States that a benefit exists when a financial contribution:

> " places the recipient in a more advantageous position than would have been the case but for the financial contribution. In our view, the only logical basis for determining the position the recipient would have been in absent the financial contribution is the market. Accordingly, a financial contribution will only confer a 'benefit', i.e., an advantage, if it is provided on terms that are more advantageous than those that would have been available to the recipient on the market."

In 2004 the panel established for United States upland cotton subsidies decided that agricultural export credits should be accepted as export subsidies under the ASCM and therefore should be prohibited. This decision was held by the Appellate Body and the scope of ASCM's red-light subsidies was thus enlarged[94].

During the Uruguay Round there were negotiations on subsidies in other sectors, most notably civil aircraft and steel. The parties were not able to reach consensus regarding

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[92] For a general review of the AoA including regional evaluations see: Josling, Tim (ed.). 1994. "The Uruguay Round Agreement on Agriculture: An Evaluation". Commissioned Paper No. 9. The International Agricultural Trade Research Consortium. For a recent study on agricultural support in the context of AoA (that also evaluates export subsidies) see: Robert, Ivan. 2003. "Three pillars of agricultural support and their impact on WTO reforms". ABARE eReport 03.5. Canberra: Australian Bureau of Agricultural and Resource Economics. Available from the World Wide Web: <http://www.abareconomics.com>.

[93] Schott, Jeffrey J. *op. cit.*: p. 14.

[94] Benitah, Marc. 2005. "U.S. Agricultural Export Credits after the WTO Cotton Ruling: The Law of Unintended Consequences". *The Estey Centre Journal of International Law and Trade Policy,* Volume 6, Number 2: pp. 107-114. The Appellate Body quote is on page 114. Similar decisions were given before; but the quoted one is the most recent and clear one. The definition emphasizes the fact that ASCM subsidies should be trade-distortive.

these sectors; so some of them tried to find solutions outside the multilateral trade system. For example while the plurilateral Agreement on Trade in Civil Aircraft that includes references to the ASCM entered into force in 1995 the two most important parties of this Agreement, namely the EU and the United States, had already signed a bilateral Agreement on Trade in Large Civil Aircraft in 1992 which prevented these two parties to challenge each others' subsidy schemes[95]. However bilateral and multilateral trade negotiations are not perfect substitutes for governments. Sometimes they prefer other international fora.

2.4.2. Organization for Economic Cooperation and Development Measures

One such forum is the Organization for Economic Cooperation and Development (OECD) that brings together European countries with other developed economies in the world because of its historical evolution. Non-member countries can also participate in the work carried out in the OECD. The intergovernmental organization has a rather (too) ambitious agenda for developing rules on problematic sectors and issues in international economic relations.

One such issue is the use export credits. OECD members accepted the Arrangement on Guidelines for Officially Supported Export Credits in 1978 in order to create a level playing field for the exporters. It was revised in 2003. The Arrangement is a "Gentlemen's Agreement", i.e. it is not legally binding on the signatories[96]. . It covers medium and long-term export credits (credits with a repayment term of two years of more) including financial leases and tied aid. The Arrangement places limitations on terms and conditions of the credits such as the minimum premium benchmarks. It does not apply to military and agricultural exports and there are special provisions called sector

[95] That is until 2004 when bilateral consultations under this Agreement collapsed and both parties requested consultations in the WTO on the same day. In 2005 the parties unsuccessfully carried negotiations to end subsidies for large aircraft. The dispute settlement process is currently under progress. The subsidies challenged are given to Boeing and Airbus. See page 23 for a study on the economic impact of subsidies given to Airbus in 1990s.

[96] However the EU has implemented it to the Community law. The related legal instrument in force is Council Decision of 22 December 2000 replacing the Decision of 4 April 1978 on the application of certain guidelines in the field of officially supported export credits (*Official Journal of the European Communities* [*OJ*] *L* 32, 02.02.2001, p. 1). This decision has been amended in by Council Decision of 22 July 2002 amending Decision 2001/76/EC in respect of export credits for ships (*OJ L* 206, 03.08.2002, p. 16). Short-term export credits that not covered by the Arrangement are regulated by the SA policy in the Community.

understandings for nuclear power plants, civil aircraft and ships. A draft sector understanding on agriculture has also been prepared[97].

The shipbuilding industry is another source of problems in international economic relations because of structural problems, strategic policies (the word being used both in economic and military meanings) and intergovernmental competition[98]. Since most of the major shipbuilders are OECD members the organization served as a useful forum for negotiating on shipbuilding over the decades and several documents were produced. The Understanding on Export Credits for Ships, negotiated in 1969, was the first such document. This Understanding later became one of the annexes of the Arrangement on Guidelines for Officially Supported Export Credits. General Arrangement for the Progressive Removal of Obstacles to Normal Competitive Conditions in the Shipbuilding Industry, another non-binding instrument, was first negotiated in 1972 and revised for the last time in 1983. This arrangement seeks to eliminate certain trade-distortive support practices among the signatories. General Guidelines for Government Policies in the Shipbuilding Industry, first negotiated in 1976 and revised for the last time in 1983, seeks to deal with the problem of overcapacity in the sector. OECD has also tried to develop a legally binding instrument in the sector. As a result the Agreement Respecting Normal Competitive Conditions in the Commercial Shipbuilding and Repair Industry was signed between EC, Finland, Japan, the Republic of Korea, Norway, Sweden and the United States in 1994[99]; but it did not enter into force in 1996 as planned because of non-ratification by the United States government. The Agreement, that clearly took the ASCM as a model, included provision on prohibited and permitted subsidies and countervailing

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[97] Organization for Economic Cooperation and Development. 2002. *Arrangement on Guidelines for Officially Supported Export Credits*. Paris: pp. 7-8; Organization for Economic Cooperation and Development. 2002. TD/CONSENSUS(2000)25/REV4. "The Chairman's Revised Proposal for a Sector Understanding On Export Credits For Agricultural Products". Paris (This document replaces the previous one; so its code includes the date 2000 while its actual date of production is 2002.). For a regime study on the Arrangement see: Moravscik, Andrew M. 1989. "Disciplining Trade Finance: The OECD Export Credit Arrangement". *International Organization*, Volume 43, Number 1: pp. 173-205.

[98] For an international political economy perspective on the sector see: Cafruny, Alan W. 1985. "The Political Economy of International Shipping: Europe Versus America". *International Organization*, Volume 39, Number 1: pp. 79-119.

[99] Finland and Sweden became Member States of the EU in 1995.

measures. Negotiations for drafting a new agreement continue with a view for conclusion by the end of 2005[100].

OECD also became a forum for the talks for drafting an agreement on steel production, another sector heavily distorted by government subsidies. The negotiations that began in 2001 still continue with some progress made on a detailed text[101].

* * *

The EC is a party to the multilateral agreements and negotiations as a single entity. Therefore the Member States of the EU are legally or customarily bound by these provisions in extra-Community trade. Moreover they are faced with an additional and stricter set of rules in intra-Community trade, the SA policy, which is reviewed in the next chapter.

[100] The above information is collected from the sub-site of the Directorate for Science, Technology and Industry of the OECD at <http://www.oecd.org>. Also see: Organization for Economic Cooperation and Development. 2004. *Annual Report*. Paris: p. 31.

[101] Organization for Economic Cooperation and Development. 2004. *Annual Report*. Paris: p. 33.

3. STATE AID POLICY OF THE EUROPEAN UNION

3.1. A Rationale for the State Aid Policy

The previous chapter provided the necessary background information for the study. In this chapter the SA policy itself is briefly examined. It is not possible to cover all details of the policy; so the examination is kept restricted to the most important aspects.

First of all, the rationale of the policy should be explained. Why does the EU need such a policy? In fact a general answer has already been given at the end of the second chapter. Subsidies cause distortions and therefore governments have incentive to act cooperatively in order to limit their use.

However SA policy is much more restricted than multilateral regulations on subsidies; so an additional explanation must be made. Here it is: The economic relations between the MSs of the EU are deeper than those among the countries taking place in ordinary international trade. Therefore they need stricter rules on trade-distorting measures.

What is the economic relation between the MSs? They have decided to integrate. International economic integration increases the total welfare of the integrating countries. The process has two faces: negative integration and positive integration. Negative integration is the (progressive) elimination of barriers to movement of factors of production between the integrating parties. Positive integration is the formation of common economic policies[102]. Negative and positive integration are not sequential phases of the process. They can progress simultaneously. This is indeed the case in the EU.

Negative integration starts with the elimination of tariffs and equivalent measures such as quotas among the MSs. However MSs have many other means of protection that can

[102] For international economic integration see: Robson, Peter. 1998. *The Economics of International Integration*. London: Routledge; Karakaya, Etem and Andrew Cooke. 2002. "Economic Integration: An Overview of the Theoretical and Empirical Literature". Applied Economic Policy Discussion Paper Series Number AEP 2002/01. Nottingham: Nottingham Trent University.

distort free trade within the SEM. Most of these means were uncovered with the 1985 White Paper "Completing the Internal Market" and prohibited with the Single European Act that was signed in 1986 and entered into force the following year[103]; but some of them were figured out during the preparations for economic integration. Thus the basic provisions governing the SA policy (See the following section.) were laid down back in 1957.

SA policy prohibits export subsidies by definition. Domestic subsidies, however, require a careful examination. As shown in the previous chapter (See pages 34 to 37.) they can be trade distorting.

Indeed in theory the exact impact of a tariff can also be obtained by a combination of consumption taxes and production subsidies. This fact is illustrated in Figure 3.1 below. P_C represents the Community price, the price prevailing in the internal market under conditions of free trade. At this price domestic production equals to $0Q_1$ and Q_1Q_4 is the level of imports from other MSs. The government imposes a tax t that increases the consumer price to P_T. The producer price does not change. Demand is reduced and the level of imports decreases to Q_1Q_3. The government then gives a specific subsidy s to the producers. The amount of the subsidy is equal to that of the tax. The producer price rises to the level P_T and the market share of the domestic producers increases to $0Q_2$. Consumer surplus falls by (a + b + c + d) while the associated producer rent is just (a). The cost of the subsidy (a + b) takes most of the tax revenue (a + b + c). The net government revenue is therefore (c) and the total domestic welfare decreases by (b + d). As a result the welfare gain obtained by the elimination of the tariff is gone.

As it can be seen if governments of the MSs were left free to use subsidies the elimination of tariffs might have lost its function. Therefore right from the beginning of the journey it was necessary to discipline the use of subsidies as a safety valve.

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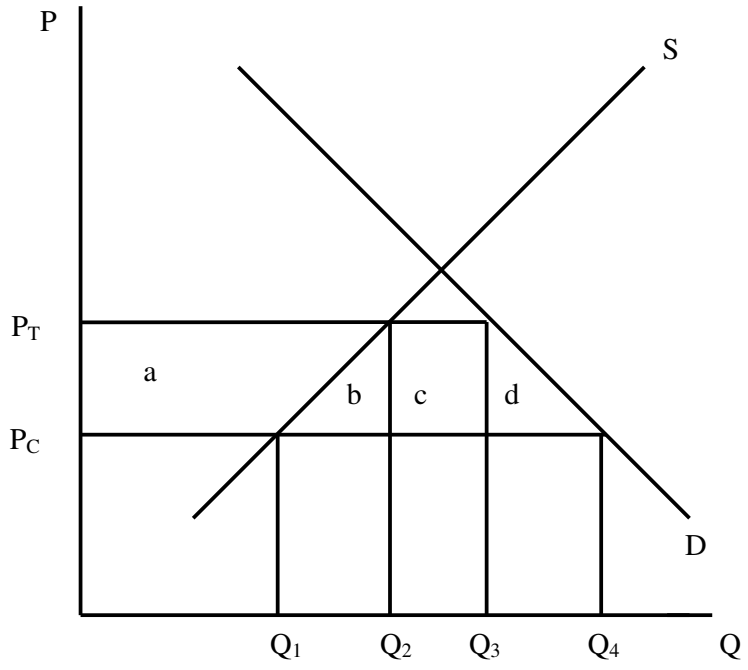
[103] According to the Cecchini Report of 1988, a study that quantified the dynamics of economic integration, there were three types of barriers to trade: physical, technical and fiscal. These are called as the non-tariff barriers to trade in general. Some of them are border measures while the others are domestic market measures. See: McDonald, Frank. 1999. "Market integration in the European Union" in McDonald, Frank and Stephen Dearden (eds.) *European Economic Integration, 3rd Edition*. United States: Addison Wesley Longman: pp. 34-72.

Figure 3.1

Equivalence of a Tariff with a Consumption Tax and Production Subsidy



More so because of the dynamic effects of market integration, reallocation of factors of production and industrial restructuring. Taking into consideration these Baldwin and Wyplosz asks two questions[104]:

> "First, as the number of firms falls, is there a tendency for the remaining firms to collude in order to keep prices high? Second, since industrial restructuring can be politically painful, is there a danger that governments will try to keep money-losing firms in business via subsidies and other policies? The answer to both questions is 'Yes'."

These questions suggest that previously unsubsidizing MSs can resort to subsidies after market integration. They also clearly show the relationship between the SA policy and other fields of Community competition policy (abuse of dominant position, concerted action, mergers & acquisitions and the related issue of liberalization[105]). While explaining

[104] Baldwin, Richard and Charles Wyplosz. 2004. *The Economics of European Integration*. United Kingdom: McGraw-Hill Education: p. 163.

[105] For the economic rationale of other fields of Community competition policy see: Kemp, John. 1999. "The European Union and Competition Policy" in McDonald, Frank and Stephen Dearden (eds.). *European Economic Integration. 3rd Edition*. United States: Addison Wesley Longman Limited: pp. 128-155. For an

their brief answer the authors further show that a first liberalize, then subsidize policy reduces domestic welfare. They add that different MSs have different propensities to subsidize and this creates an unfair situation.

The above analysis suggests that the SA policy is basically related with the negative integration phase of international economic integration. Indeed it was formulated in 1957 when the focus of European economic integration was limited with this type of integration[106]; but before making a definitive judgment one has to study the its content and application as well.

examination of the policy itself see: Cini, Michelle and Lee McGowan. 1998. *Competition Policy in the European Union.* London: Macmillan Press; McGowan, Francis. 2000. "Competition Policy: Limits of the European Regulatory State.", in Wallace, H. and W. Wallace (eds.). *Policy-making in the European Union*. New York: Oxford University Press.

[106] Previous attemps at non-economic positive integration, namely European Political Union and European Defence Union, had failed. And the first common economic policy, Common Agricultural Policy, became operational in 1962. For the history of European integration see: Dinan, Desmond. 1999. *Ever-Closer Union: An Introduction to the European Union, 2nd Edition*. London: Macmillan.

3.2. State Aids in the Community Law

The SA policy is designed to discipline the use of subsidies by MSs. As stated before it does not cover all subsidies, but those that are trade-distorting and production-related. Moreover the drafters of primary law have found it appropriate to allow certain trade-distorting aids. Therefore the definition of SA in Community law is complex.

Moreover its application to innumerous specific cases over approximately six decades has created a large body of legislation and case laws. Indeed SA law is accepted as a major sub-branch of Community law today[107]. As a result a large body of legal literature has appeared on the subject. There is even a journal dedicated to these studies since 2002, *European State Aid Law Quarterly (EStAL)*, besides those already specialized in Community law such as *Common Market Law Review*. Taking these into consideration it is not attempted to provide a comprehensive overview of SA law below[108]. Instead the focus is on the definition of SA.

Main provisions on SAs are to be found in Articles 87, 88 and 89 of the Treaty of Rome, or formally the Treaty Establishing the European Community[109,110]. These Articles are placed under Part Three-Community Policies, Title VI-Common Rules on Competition, Taxation and Approximation of Laws, Chapter 1-Rules on Competition, Section 2-Aids Granted by States.

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[107] For the basics of Community law and institutions see: Borchardt, Klaus-Dieter. 2000. *The ABC of Community Law*. Brussels: Commission of the European Communities.

[108] For detailed studies on the SA law see: D'Sa, Rose. 1998. *European Community Law on State Aid*. London: Sweet & Maxwell; Bilal, Sanoussi and Phedon Nicolaides (eds.). 1999. *Understanding State Aid Policy in the European Community: Perspectives on Rules and Practice*. Maastricht: European Institute of Public Administration; Quigley, Conor and Anthony Collins. 2003. *EC State Aid Law and Policy*. Oxford: Hart Publishing; Biondi, Andrea (ed.). 2004. *The Law of State Aid in the European Union*. Oxford: Oxford University Press. For a short treatment of both law and its application from a practical perspective see the booklet prepared by United Kingdom Department of Industry and Trade: Department of Industry and Trade. 2001. *European Community State Aids*. London. Available from the World Wide Web: <http://www.dti.gov.uk/europe/stateaid>. For a summary of the legislation consult the SCADPlus pages on the Europa web site.

[109] The Articles of Treaty of Rome were re-numbered by the Treaty of Amsterdam. The previous numbers of the Articles in question are 92 to 94. For the version of the Treaty in force see: Consolidated Version of the Treaty establishing the European Community (*OJ* C 325, 24.12.2002, s. 33).

[110] Paris Treaty of 1951, or the Treaty Establishing the European Coal and Steel Community, also included articles related to SA (Article 4, Article 54 and Article 95). These provision were naturally related to the coal and steel sectors. Paris Treaty, unlikely the Treaties of Rome, was designed to remain in force for a limited period of time: 50 years. Therefore it is not in force since July 2002. The competences of the European Coal and Steel Community has been transferred to the EC.

Article 87 provides that:

> " Save as otherwise provided in this Treaty, any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favoring certain undertakings or the production of certain goods shall, in so far as it affects trade between Member States, be incompatible with the common market."

Save otherwise provided is a reference to Article 36 and Article 73 that allow respectively agricultural aids and transport aids under certain conditions. The rest of the Article 87 lays down the legal elements of a SA. In order to qualify as a SA a measure must (1) be an aid, (2) be granted by a MS, (3) distort or threaten to distort competition and (4) affect intra-Community trade. If these elements are met by a measure, it is a SA and it is illegal under the Treaty[111].

There is more than that meets the eye in the definition above; because Article 87 emphasizes favoring certain undertakings. This means that general measures cannot be accepted as SA. Therefore SA policy cannot be utilized to prevent competitive devaluations and more relevantly tax competition[112]. Other common policies are needed.

If a SA (1) has a social character and granted to individual consumers without any conditions on the origin of the products concerned, (2) is granted to make good the damage caused by natural disasters or exceptional occurrences or (3) is granted to certain areas of Germany adversely affected by the division of the country during the Cold War in so far as such aid is required for compensation of the damage it should be allowed.

SA may also be allowed in other circumstances. These are listed as follows: (1) aid to promote development of underdeveloped areas or areas with serious underemployment, (2) aid to promote the execution of an important project of common European interest or to

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[111] And under national legal systems of the individual MSs because of the principle of the supremacy of Community law.

[112] For the interesting question of relation between taxation and SAs see: Wishblade, Fiona. 1997. "When Are Tax Advantages State Aids and When Are They General Measures?" Regional and Industrial Policy Research Paper Number 20. Glasgow: University of Strathclyde European Policies Research Center; Schön, Wolfgang. 1999. "Taxation and State Aid Law in the European Union". Common Market Law Review, Volume 36, Number 5: pp. 911-936; Quigley, Connor. 2004. "General Taxation and State Aid". in Biondi, Andrea (ed.). *The Law of State Aid in the European Union*. Oxford: Oxford University Press: pp. 207-218.

remedy a serious disturbance in a MS, (3) aid to facilitate the development of certain economic activities or of certain economic areas without contradicting the common interests of the MSs, (4) aid to promote culture and heritage conservation without affecting trading conditions and (5) other categories of aids that may be specified by the Council of Ministers on a proposal from the Commission.

Note that SAs should be allowed in the former case while they might be allowed in the latter one. There is an important difference: The executive authority cannot use discretion in the former case. However this does not mean that the aids in question will not be subject to a review and if necessary investigation process; because the declared and actual objectives of a given SA decision/scheme might be different.

Article 88 is on the procedural aspects. MSs are obliged to notify all intended aids to the Commission which should evaluate their compatibility with the common market and also keep under constant review all aid measures in the EU. If a SA decision/scheme is evaluated to be incompatible with the common market it cannot be applied. If it is already applied it becomes illegal and the aid dispersed should be reimbursed. Interest rates determined by the Commission are applied to the reimbursed aids[113].

Article 89 confers on the Council the competence to make regulations on the application of two previous articles[114].

These provisions give the Community exclusive competence in the field of SA policy. In other words the MSs are not granted any autonomy regarding trade-distorting aids. This is not the case, for example, in Common Agricultural Policy (CAP) where even though all agricultural market mechanisms, the common market organizations, are determined in Brussels MSs can still make national regulations on issues not covered by the Community law. Other policy areas where the EU has exclusive competence are the rest of the

[113] The reimbursement of the aid is the only sanction in mechanism the SA policy. Despite this sanction it is observed that the MSs still give illegal aid (substantial breach) or do not notify aid decisions/schemes (procedural breach). Therefore some authors argue that the sanctioning mechanism of the policy should be improved. For example see: Nicolaides, Phedon. 2002. "Control of State Aid in the European Union: Compliance, Sanctions and Rational Behaviour". *World Competition*, Volume 25, Number 3: pp. 249-262.

[114] The word regulation is used as a specific term, not a general one. A regulation is a Community legal instrument that is binding and directly applicable.

competition policy, monetary policy (for MSs that have adopted EUR), Common Commercial Policy, customs union measures and conservation of marine biological resources under Common Fisheries Policy.

These Articles has been the subject of a large body of case law by the Court of Justice of European Communities (Both MSs and the rivals of those enterprises that receive permissed SA have taken the Commission to the Court.). Each element and each exception has been interpreted widely[115].

This process of judicial review has demonstrated that even though the Court approves most of the decisions of the Commission, there is an inherent conflict between these institutions' interpretation of the SA law: The former gives predominance to economic analysis (increasingly so in recent years) while the latter strictly limits its analysis with legal reasoning.

For example during the first half of the 1990s the Court gave a number of rulings that stated whether or not a government measure confers a benefit to a specific undertaking if it does not charge to public accounts it cannot be accepted as a SA. The reasoning was based on the first element of SA. The Commission preferred a broader definition of SA taking into consideration the economic impact of the measures[116].

The judgment in the Altmark Case in July 2003, one of the most recent and most important judgments ever is both another example and a historic development in SA policy. This case was about the already problematic issue of services of general economic interest (SGEI). There is no explicit definition of the concept SGEI in the Community law. The services of general interest (SGI) are those that have a public good or merit good nature.

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[115] For more information see: Winter, Jan A. 1993. "Supervision of State Aid: Article 93 in the Court of Justice". *Common Market Law Review*, Volume 30: p. 311; D'Sa, Rose. 2000. "When is Aid not State Aid?: The Implications of the English Partnerships Decision for European Competition Law and Policy". *European Law Review*, Volume 25, Number 2: pp. 139-156; Paul, K. and E. Lasok. 2000. "State Aids and the Consequences of their Illegality under EC Law". *Marmara Journal of European Studies,* Volume 8, Number 1-2: pp. 19-32; Köksal, Tunay. 2002. *Avrupa Birliği ve Türkiye'nin Devlet Yardımları Sistemlerinin Uyumlaştırılması*. Ankara: Etki Yayıncılık: pp. 6-65; Quigley, Conor and Anthony Collins. *op. cit.*: pp. 1-124; Plender, Richard. 2004. "Definition of Aid" in Biondi, Andrea (ed.). *The Law of State Aid in the European Union*. Oxford: Oxford University Press: pp. 3-40.

[116] Slotboom, Marco. 1995. "State Aid in Community Law: A Broad or Narrow Definition?". *European Law Review*, Volume 20, Number 3: pp. 289-301.

SGEIs are among SGIs; but they can be provided by the market. However they do not used to be until the wave of liberalization and privatization that struck in late 1970s. Therefore SGEIs are observed in industries that were once dominated by public monopolies. These sectors are characterized by large network externalities. Telecommunications, postal services, transport, energy and sometimes water and public broadcasting are accepted as SGEIs. Therefore SGEIs are essentially what is called utilities outside the framework of Community law.

The issue of SGEIs has been a problematic are because even after privatization enterprises providing SGEIs can be compensated by governments for carrying out public service obligations (PSOs). In the Altmark case the Court ruled that such compensation was not SA provided that (1) the PSO is real and clearly defined, (2) the compensation scheme is clearly defined in advance, (3) the revenues created by the PSO are taken into consideration and (4) the SGEI provider is selected through public procurement or the compensation is calculated in an equivalent way. This judgment was against the interpretation of the Commission (that usually takes more liberal positions vis-à-vis the majority of MSs) who lost the case. As a result the statistics on SA were reviewed and the Commission published a White Paper in order to formulate a new SGEI policy[117].

[117] For the historical development of the policy on this interesting issue see: Commission of the European Communities. 11.09.1996. COM(1996) 443 final. Communication from the Commission: Services of General Interest. Brussels; Commission of the European Communities. 20.09.2000. COM(2000) 580 final. Communication from the Commission: Services of General Interest in Europe. Brussels; European Commission. 12.12.2002. Non-Paper: Services of general economic interest and state aid. Brussels; Commission of the European Communities. 21.05.2003. COM(2003) 270 final. Green Paper on Services of General Economic Interest. Brussels; Commission of the European Communities. COM(2004) 256 final. *Report: State Aid Scoreboard. Spring 2004 Update*. Belgium: p. 8; Commission of the European Communities. COM(2004) 374. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: White Paper on services of general interest. Brussels.

3.3. Application of the State Aids Policy

3.3.1. Institutional Aspects and Characteristics of the Application

When the facts that exclusive competence is granted to the EU by the Treaty in the field of SA policy (and more general in competition policy) and that the scope of this policy is limited with executive (and judicial) review of certain measures by non-legislative institutions of the EU are considered together it is not difficult to draw the conclusion that the SA policy is a supranational one[118].

Indeed while other branches of the EU's competition policy such as antitrust have national counterparts there is no national SA policy anywhere in the world. However there are similar multilateral policies reviewed in the previous chapter. This shows that the SA policy is supranational by its nature and not because of its legal-institutional context in the EU.

The basic reason behind this phenomenon is that even though in a national system politicians do delegate some choices to independent bureaucracies these are the risky ones such as monetary policy, risk being defined over the probability of re-election, and not redistributive ones that can be used to buy votes[119]. This finding can be extended to the means of control (For example constitutional or administrative law do not make judgments about the substance of executive/legislative decisions.). However international settings provide a rationale for delegation of control of redistributive means. Note that this delegation is partial.

The main actor in the field of SAs is the Commission[120]. It sets the policy and takes the decisions regarding specific cases. The Commission is very keen about its powers in the field.

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[118] McGowan, Francis and Stephen Wilks. 1995. "The First Supranational Policy of the European Union: Competition Policy". *European Journal of Political Research*, Volume 28: pp. 141-169; Cini, Michelle and Lee McGowan. *op. cit.*: pp. 135-159.

[119] Alesina, Alberto and Guido, Tabellini. 2005. "Why Do Politicians Delegate?" National Bureau of Economic Research Working Paper No. 11531. Available from the World Wide Web: <http://www.nber.org/papers/wp11531>.

[120] For the Commission see: Nugent, Neill. 2000. *The European Commission*. London: Macmillan Press.

However there are problems within the institution regarding application. The first problem is caused by the fact that four different directorate-generals (DGs) of the Commission are responsible for decisions. DG Competition is the main DG in charge. It has a directorate on SAs, several sectoral directorates and a Directorate A for planning and coordination. The other responsible DGs are sectoral: DG Agriculture, DG Fisheries and DG Transport and Energy. Sectoral DGs are more likely to allow SA schemes taking into consideration the needs of their clients. Therefore they sometimes clash with DG Competition. The more important problems, however, are those among DG Competition and other horizontal policy directorates, especially DG Regional and Cohesion Policy and DG Environment. These DGs support SA schemes that contribute to the fulfillment of their policy objectives. Problems also arise within the College of Commissioner who approve the final decision. Commissioners have different ideological positions and nationalities that make them oppose DG Competition's judgments[121].

The application of the SA policy by the Commission is also handicapped by political pressures from MSs. The institution can stand against political pressure in most cases; but MSs sometimes attach great political importance to certain aids and the Commission takes a few steps back after intensive bargaining[122]. The recent Alstom case is a good example where France was very stubborn for saving one of its national champions and a hundred thousand jobs. Therefore it can be stated that the Commission partially displays "bureaucratic minimal squawk behavior"[123].

However this situation is not contradictory to the supranationalism of the SA policy. The Commission steps back; because unless it does so MSs might try to impair the policy itself or simply not comply with the decision. The only enforcement mechanism in such a situation is peer pressure and it might not come. Of course this is only valid for major cases. MSs would not hurt their reputation for cases of minor political importance.

Indeed bargaining is an integral part of SA decision-making process. The process starts with the notification of the aid. A rapporteur is assigned to the case by the DG in charge.

[121] McGowan, Francis. 2000. *op. cit.*: pp. 133-134.
[122] McGowan, Francis. 2000. *op. cit.*: p. 129.
[123] Leaver, Clare. 2004. "Bureaucratic Minimal Squawk Behaviour: Theory and Evidence from Regulatory Agencies". Available from the World Wide Web: <http://www.econ.ox.ac.uk/members/clare.leaver>. This working paper will be published soon.

S/he has two months to reach a conclusion. If the rapperteur finds that the notified decision/scheme is compatible with the common market permission is given and summary information is published on the C series of the Official Journal. If the rapporteur concludes that the aid might not be compatible or if the aid is unnotified the formal investigation phase starts. However before the iniation of a formal investigation the subsidizing MS is informed by the Commission so that a solution can be reached through informal talks between the parties. If the bargaining fails the investigation proceeds and is concluded with a reasonable time. The Commission has extensive investigation powers including audits at the premises of the related parties. One essential element of the investigations is determining the relevant product market and the relevant geographical market which requires quantative techniques. Once the relevant markets are determined than the aid is analyzed according to the market economy investor principle. If the aid fails to meet this principle then it is considered whether or not it might be allowed under the exceptions provided in the Treaty, possibly subject to certain conditions. Given the nature of the problem lawyers and economists work together. Interested parties have the right to be heard. The final decision takes the form a legal instrument and is published in the L series of the Official Journal[124].

The interested parties naturally have recourse to the Court[125]. Therefore the Court is also an important actor[126]; but its role is secondary despite the importance of the case law it produces. The reason is that it can only intervene when there is a legal conflict.

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[124] For general evaluation of the procedures see: Slot, Piet Jan. 1990. "Procedural Aspects of State Aids: the Guardian of Competition Versus the Subsidy Villains?". *Common Market Law Review,* Volume 27: pp. 741-760; Cini, Michelle and Lee McGowan. *op. cit.*: pp. 140-141; Sinnaeve, Adinda and Piet Jan Slot. 1999. "The New Regulation on State Aid Procedures". *Common Market Law Review*, Volume 36, Number 6: pp. 1153-1194. For the right to be heard see: Giannakopoulos, Themistoklis. 2001. "The Right to be Orally Heard by the Commission in Antitrust, Merger, Anti-dumping/Anti-subsidies and State Aid Community Procedures". *World Competition*, Volume 24, Number 4: pp. 541-569. For market definition issues see: Fingleton, John, Frances Ruane and Vivienne Ryan. 1998. *A Study of Market Definition in Practice in State Aid Cases.* Available from the World Wide Web: <http://europa.eu.int/comm/competition>; Fingleton, John, Frances Ruane and Vivienne Ryan. 1998. *Market Definition and State Aid Control.* Available from the World Wide Web: <http://europa.eu.int/comm/competition>. For the market economy investor principle see: Abbamonte, Giuseppe B. 1996. "Market Economy Investor Principle: A Legal Analysis of an Economic Problem". *European Competition Law Review,* Volume 17, Number 4: pp. 258-268.

[125] See specifically: Winter, Jan A. 1999. "The Rights of Complainants in State Aid Cases: Judicial Review of Commission Decisions Adopted Under Article 88 (Ex 93) EC". *Common Market Law Review,* Volume 36: pp. 521-568.

[126] For the Court see: Dehousse, Renaud. 1998. *European Court of Justice: Politics of Judicial Integration*. London: Macmillan Press.

Nowadays most cases are finalized in the Court of First Instance and Court of Justice, the appeals chamber, seldom gives major judgments.

It should also be emphasized that national courts can and-according to the case law-should also enforce the procedural proprieties of the Articles 87 to 89 as in the case of other fields of Community law[127].

The Council does not have much to say[128]; but its role has gained some importance in 1990s (of more below). The Council sits in different configurations that are altered whenever it is deemed to be necessary. SA issues were used to be discussed by the Industry Council. They are now discussed by the Competitiveness Council that was formed as a result of the reorganization of responsibility areas among configurations following the Lisbon Strategy and replaced the Industry Council.

Under Article 89 of the Treaty the Council is the body that is supposed to issue regulations; but compared to other fields of activity such as justice and home affairs and agriculture its legislative work load is at the minimum.

The reason is that the Commission, that has monopoly over legislative initiation, does not forward proposals to the Council. It prefers to produce soft law instead. Soft law cannot create binding obligations on the parties unlike hard law; but it has a bearing on the application of hard law and policies in general. In the case of SA legislation soft law shows how will the Commission use its discretion in certain issues. Therefore it is very detailed and includes crucial information such as permitted aid ceilings. The prevalence of soft law is an indication of the autonomy of the Commission in the field of SAs[129].

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[127] Ross, Malcolm. 2000. "State Aids and National Courts: Definitions and Other Problems – A Case of Premature Emancipation?". *Common Market Law Review*, Volume 37: pp. 401-423.; Flynn, James. 2004. "The Role of National Courts" in Biondi, Andrea (ed.). *The Law of State Aid in the European Union.* Oxford: Oxford University Press: pp. 323-336.

[128] For the Council see: Hayes-Renshaw and Helen Wallace. 1996. *Council of Ministers*. London: Macmillan Press.

[129] Cini believes that there has been a tilt towards hardening of the law recently, but also that this was a requirement of the SA policy: Cini, Michelle. 2000. "From Soft Law to Hard Law?: Discretion and Rule-making in the Commission´s State Aid Regime". Robert Schuman Centre Working Paper Number 35. Florence: European University Institute.

European Parliament has a purely consultative role given that the consultation procedure is used[130]. The Parliament sometimes tries to increase its influence by drafting reports on the annual competition policy reports prepared by the Commission.

However the Committee of Regions and the Economic and Social Committee, two main consultative organs of the EU, are more active in issuing opinions (on legislation and reports, not individual cases) in the SA field; because they believe that given the interest they represent they can have an impact on the policy. Whether or not this is true is questionable.

3.3.2. Historical Development of the Application[131]

SA policy did not have a high profile during the first decade of European economic integration. The basic provisions were included in the Treaty of Rome thanks to the foresight of the drafters. However these provisions became relevant only in 1968, the year when the MSs completed the customs union among themselves. Several exceptions were included to Article 87 (then Article 92); but the drafters did not have in mind specific policies. Rather these provisions reflect the embedded liberalism prevalent in the period[132] and a catch-all desire.

During 1970s Europe faced with economic difficulties because of shifting comparative advantages and oil crises. New protectionism emerged and industrial policy gained importance. Therefore the Commission pursued a lax SA policy and allowed most of the aid measures until the mid-1980s. "This pragmatic neglect has to be seen in the context of the overall status of European integration and the European economy at the time.[133]" However the Commission also gained valuable information and experience about certain problematic sectors such as textiles.

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[130] There are four main legislative procedures used in the EU: consultation, assent, co-operation and co-decision. The independent variable behind this categorization is the extent of the involvement of the European Parliament. Under the consultation procedure the Council gives the decision after taking the opinion of the Parliament which it might not take into consideration.

[131] For a general account up to 1997 see: Cini, Michelle and Lee McGowan. *op. cit.*

[132] Ruggie, John Gerard. 1983. "International Regimes, Transactions and Change: Embedded Liberalism in the Post World War Economic Order". *International Organization*, Volume 36, Number 2: pp. 379-415.

[133] McGowan, Francis. 2000. *op. cit.*: p. 129.

On the other hand starting from the late 1960s the Commission also faced a regional challenge. At the beginning of the European integration process regional income and development differences had not been taken into account. However they came to the forefront starting with the problems of Mezzogiorno. The first three enlargements as well as the German reunification (an implicit enlargement) expanded the regional problem. As a result the Community first developed the regional policy and then the cohesion policy and started to pour huge amounts of subsidies to less developed areas and countries[134]. Furthermore the economic difficulties of 1970s also stimulated richer governments to give out subsidies to regions going under structural difficulties (for example because of the concentration of sun set industries).

The Commission started to concentrate on this issue and established a number of principles during the 1970s. This was the beginning of the utilization of soft law in SA policy. The Commission allowed regional aid in principle, but limited it with certain regional ceilings. However many practical difficulties, such as the method for the cumulation of aids, appeared leading to some conflicts[135].

Of course regional policy was not the sole newly emerging issue in the context of European integration in the 1970s. The same decade saw other issues such as R&D policy and environmental policy gaining prominence as well.

The SA policy took off in mid-1980s. There were two reasons behind this development: the Single Market Programme and the importance attached to the issue by successive Competition Commissioners.

Single Market Programme created SEM. Deeper market integration also required a stronger SA policy; because the SAs now had a greater impact on trading conditions and

[134] For economics of regional policy see: Martin, Reiner. 1999. "Regional Policy", in McDonald, Frank and Stephen Dearden (eds.). *European Economic Integration. 3rd Edition*. Essex: Addison Wesley Longman Limited. For the politics see: Allen, David. 2000. "Cohesion and the Structural Funds", in Wallace, H. and W. Wallace (eds.). *Policy-making in the European Union*. New York: Oxford University Press.

[135] Wishblade, Fiona. 1997. "EC Competition Policy and Regional Aid: An Agenda for Year 2000?". Regional and Industrial Policy Research Paper Number 25. Glasgow: University of Strathclyde European Policies Research Center.

the dynamics of further integration could have spurred a new wave of collusion and protectionism through subsidies like the original integration.

Moreover the Subsidies Code signed at the end of the Tokyo Round of multilateral trade negotiations and the negotiations on the same issue during the Uruguay Round were attracting a greater interest to SAs.

Competition Commissioner Peter Sutherland ordered the formation of Task Force on State Aids in 1985 in this context. This Task Force reviewed all SA schemes in force and prepared the *First Survey of States Aid in European Community* that was published in 1988. As a result transparency was ensured in the field for the first time. The figures included in the *Survey*-such as the fact that SA made 10 % of the public expenditure in the period- facilitated the stepping up of the policy. Eight more surveys were published. Today the surveys are replaced by State aid scoreboards.

While Peter Sutherland ensured transparency, his successor Leon Brittan developed three principles that served as the main guidelines of the policy thereafter. These were (1) that the appropriateness of existing aid should not be taken for granted, (2) that the effectiveness of policy should be improved and (3) that aid transparency must become a priority.

Under Karel van Miert and especially Mario Monti the economic dimension of competition policy gained importance. For example Monti, who himself was a professor of economics, appointed a chief competition economist and also formed an advisory group consisting of economists.

At the same time the volume of SA legislation increased and reached approximately a thousand pages. Most of the legislations consisted of soft law documents. These came under various titles: frameworks, guidelines, codes et cetera. They were the result of the experience accumulated by the Commission in the application of SA rules to certain issues and especially sectors. These documents are reviewed and if necessary updated periodically.

Hard law was also produced in the period. Most importantly Article 89 was used for the first time since 1958 in order to issue a Council regulation on horizontal SA[136]. Under this Council regulation the Commission published three block exemption regulations that covered employment, training and small and medium sized enterprises (SMEs). The idea of block exemption regulations was borrowed from antitrust law. The predictability and therefore the credibility of the policy was enhanced and the workload of the Commission got lighter[137].

As a result of the development of the policy and the corresponding legislation, three distinct sub-branches of the SA policy (other than procedural rules) had emerged by mid-1990s: regional aid policy, sectoral aid policy and horizontal and regional aid policy (covering environment, R&D, rescue and restructuring and other financial issues as well as the block exemption regulations mentioned above). This is not an official categorization, but was nevertheless used by some Commission publications. Nor it is a neat one; because subsidies distributed under an approved regional aid scheme might end up as sectoral or horizontal SAs (The existing statistics are not sufficient for determining the end use of subsidies.).

Under Prodi Commission, where Mario Monti was the Competition Commissioner for the second time, the SA policy was given a new function as well. This approach was adopted by the following Barroso Commission and its Competition Commissioner Neeline Kroes. Before the Prodi Commission SA policy was perceived as a negative regulatory policy opposed to positive industrial policy. Moreover the policy was limited with the examination of specific cases of subsidization. In the context of the Lisbon Agenda (renamed as the Partnership for Growth and Jobs by the Barroso Commission) the SA policy was re-defined as a competitiveness-enhancing positive policy with a focus on the total level and quality of SA as well as specific cases. The aim is to reduce the total level

[136] Council Regulation (EC) No 994/98 of 7 May 1998 on the application of Articles 92 and 93 of the Treaty establishing the European Community to certain categories of horizontal State aid (*OJ L* 142, 14.05.1998, p. 1).

[137] For a legal evaluation see: Sinnaeve, Adinda. 2001. "Block Exemptions for State Aid: More Scope for State Aid Control by Member States and Competitors". *Common Market Law Review*, Volume 38, Number 6: pp. 1479-1501. For a political science evaluation which states that the proposal was motivated by the constraints on the regulatory capacity of the Commission see: Smith, Mitchell P. 2001. "How Adaptable is the European Commission? The Case of State Aid Regulation". *Journal of Public Policy*, Volume 21, Number 3: pp. 219-238.

of SA and refocusing aids to horizontal issues, especially those that create economic benefits such as R&D and vocational training. This approach places the SA policy in an integrated framework for competitiveness[138]. A new State Aid Action Plan was recently published for this purpose[139].

Taking into consideration the basic provisions and the application SA policy cannot simply be accepted as a measure basically related with the negative integration phase of international economic integration as the rationale put forward in the first section of the present chapter suggests. The policy actually tries to strike a balance between the negative and positive dimensions of European economic integration. And that is the hypothesis of this study: The SA policy of the EU is designed to prevent MSs from giving subsidies that have distortive effects in the context of European economic integration unless they are otherwise acceptable.

[138] Commission of the European Communities. 21.11.2003. COM(2003) 704 final. Communication from the Commission to the Council and the European Parliament: Some Key Issues in Europe's Competitiveness – Towards an Integrated Approach. Brussels; Commission of the European Communities. 20.04.2004. COM(2004) 293 final. Communication from the Commission: A pro-active Competition Policy for a Competitive Europe. Brussels.

[139] Commission of the European Communities. 2005. State Aid Action Plan: Less and better targeted state aid: a roadmap for state aid reform 2005-2009. Brussels.

4. EXPLAINING THE STATE AIDS POLICY

4.1. Review of the Economic Literature

In the second chapter reasons of government intervention and effects of subsidies were analyzed based on various branches of economics literature. The third chapter referred to this literature while explaining the rationale of the SA policy. Some other economic studies were also cited while describing specific SA rules. However the economic literature on SA policy itself has not been reviewed yet. The present chapter fulfills this task in order to provide a modest contribution to the literature by developing a more realistic model of the policy.

* * *

Most academic studies on the SA policy are legal. As stated in the previous chapter there is even a journal dedicated to these studies besides those already specialized in Community law. Legal studies deal with the procedural aspects and developments in application and case law[140].

There are a few political science examinations that deal with the functional role of the SA policy in the greater context of European integration and the institutional roles in the making and application of the policy[141].

The number of strictly economic articles that examine SAs is not high either. This scarce economic literature can be categorized as econometric political economy studies and theoretical modeling studies, the latter category being of greater importance[142]. There are

[140] Many legal studies are cited in the previous chapter including the most important books on the subject.
[141] Several recent political science studies are cited in the previous chapter.
[142] The emphasis on examination of SAs excludes methodological studies such as those on the relevant market definition in SA investigations and regional economics studies that are not interested in the SA policy *per se*, but its regional implications. Most of these studies are cited in the previous chapter. The introductory *European Economy* volume is not considered either. Also some dated policy-oriented studies might not have been covered.

two articles in the first category and seven articles in the second one (with one author writing four of them).

In his econometric political economy article Zahariadis[143] states that there are three competing explanations on government subsidization. According to socioeconomic explanation higher unemployment leads to higher subsidies; because governments do not want to lower their electoral chances due to social and political problems caused by unemployment. The political party explanation argues that left governments are more likely to distribute subsidies. The last explanation turns to the external world and argues that more foreign competition leads to higher subsidies. The author tests these explanations using data on nine MSs for the 1981-1986 period controlling for growth and elections. The results are not conclusive. It is found that both parties and external competition have effect on subsidies and unemployment does not. Based on his findings Zahariadis argues that EU is unlikely to reform its SA policy to make it more restrictive since at any given time MSs differ in the ideological positions of their governments and in external trade balances. This view is consistent with the policy analysis that concluded the previous chapter.

While Zahariadis takes into consideration sociological, political and economic factors Neven[144] concentrates on only political determinants: weakness of governments, government ideological orientations, concentration of industries and timing of elections. He tests these determinants using data on 10 MSs for the period 1981-1990. The findings indicate that government weakness and ideology as well as concentration of firms lead to higher levels of subsidies. However the timing of elections does not seem to matter. A major difference between the Zahariadis and Neven studies is that in the latter one right-wing governments are more likely to subsidize since business forms their constituency. Neven also finds that there are important fixed differences between countries. One

[143] Zahariadis, Nikolaos. 1997. "Why State Subsidies? Evidence from European Community Countries, 1981-1986." *International Studies Quarterly*, Volume 41: pp. 341-354. The author uses state subsidies and state aids interchangeably and takes into consideration only producer subsidies as in this study.

[144] Neven, Damien J. 1994. "The Political Economy of State Aids in the European Community: Some Econometric Evidence". Centre for Economic Policy Research Discussion Paper DP945. London. A more recent version of this paper is published as: Neven, Damien J. and L-H. Röller. 2000. "The Political Economy of State Aids in the European Community. Some Econometric Evidence" in Neven, Damien J. and L-H. Röller (eds.). *Does Europe have an Industrial Policy?* Berlin: Sigma.

explanation for this phenomenon is the differences in laxity of procedures for distributing SAs since laxer procedures can lead to capture.

It is worth mentioning that International Monetary Fund[145] has also carried out an econometric study on subsidies that is not directly related to the SA policy of the EU. The model employed by the Fund's economists is based on the Public Choice school: The governments maximize self-interest subject to some constraints that can include public well-being. Therefore this model also seems like a political economic one; but the variables tested are mainly economic. The model is tested using data for 40 countries including MSs of the EU for a time period ranging from 1975 to 1992. The findings show that level government expenditures, the degree of openness of the economy and the shares of manufacturing and agriculture are positively related to the level of subsidies while for external current account balance and the ratio of interest expenditures relative to GDP the relation is negative. Therefore the study concludes that country-specific factors are dominant in explaining subsidies, but certain common characteristics such as a small government can be helpful for reducing them.

Econometric studies on subsidies are of course valuable contributions to one's understanding of the question. However they try to explain why governments give subsidies and do not provide insight about subsidy regulations[146]. Moreover unlike, for instance, growth studies they do not generate robust results because of problems with defining and measuring subsidies as well as the lack of a definite underlying model explaining the generation of subsidies. Therefore these studies seem to be useful in uncovering insignificant (unemployment, timing of elections) or constraining (external current account et cetera) issues rather than explaining subsidization[147].

Given that one has to turn to theoretical modeling studies that provide more insight about

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[145] Clements, Benedict, Hugo Rodríguez and Gerd Schwarts. *op. cit.*

[146] So they could have been reviewed in the second chapter had that chapter not been devoted to general studies instead of specific ones. The International Monetary Fund study which is general has been cited there.

[147] There is also a single sociological paper on this issue: von Pappel, Hans. 2002. Culture, State Aids, and Competitiveness in Europe: Cultural Diversity in the Improvement of Competitiveness Across Europe. Working Paper. Available from the World Wide Web: <http://www.uvt.nl/iric>. The author believes that cultural differences explain the propensity of governments to give SAs.

the SA policy. One thing common on these studies is that they are partially based on strategic trade theory literature.

The first of these studies, which is conducted by Besley and Seabright[148], has been mentioned in the second chapter. This study was commissioned by DG Competition; so it is very policy-oriented. The authors bring two theoretical criticisms to the current application of SA policy, namely that the policy (1) does not take into consideration the possible impact of SAs on the optimal allocation of geographical activity within the Community and that (2) it does not evaluate the desirability of intergovernmental competition (It is worth reminding that the three theoretical explanations put forward by the authors for evaluating the policy are strategic trade theory, Tiebout tradition in public finance and new economic geography.). To make their point Besley and Seabright construct a model that examines locational externalities and intergovernmental competition simultaneously. It is a menu auction model where two governments (A, B) compete to affect the investment choice of a firm. In the basic model this competition yields efficient outcomes. The only alternative is an omniscient supranational authority with fiscal sovereignty, that is a body that knows the externalities associated with all locations and can use taxes and subsidies to give right investment incentives.

The model is advanced by the introduction of multiple firms. Each of the firms makes an investment decision in one of the two time periods; so the firms are denoted (1, 2). The decisions affect each other. Government policies are in the form of a vector of subsidies conditional on the investment decisions. The investment decisions of the firms in the periods are

$$\underset{q^1 \in Q^1}{Max}\left[\pi^1\left(q^1\right)+ s_A^1\left(q^1\right)+ s_B^1\left(q^1\right)\right]$$

and

$$\underset{q^2 \in Q^2}{Max}\left[\pi^2\left(q^2\right)+ s_A^1\left(q^1, q^2\right)+ s_B^1\left(q^1, q^2\right)\right]$$

[148] See footnote 39.

while the corresponding government payoff is

$$V_i(q^1, q^2) - s_i^1(q^1) - s_i^2(q^1, q^2) + y_i$$

where q stands for investment that belong to the compact set Q and s is subsidy.

The authors show that when there are multiple firms instead of a single one there are clustering effects (snowball or congestion) and that intergovernmental competition can lead to inefficiencies. They also discuss institutional restrictions on bidding (that might lead to generic instead of *ad hoc* aids), government failures (especially political economic ones) and imperfect information. All of these aspects are likely to increase the distortionary impact of SAs.

Based on this model Besley and Seabright examine the application of SA policy and state that the essence of the policy is identifying generic aids that do distort competition and *ad hoc* aids that are acceptable. Evaluation of generic schemes is difficult; but one determinant would be the number of firms actually taking the aids. *Ad hoc* aids should be evaluated basically taking into consideration whether the aid receivers have market power or not, whether the investment is greenfield or not and whether the aid is predatory or not. The authors then propose an algorithm of new policy rules. The proposed rules implicitly emphasize the principle of subsidiarity and explicitly require the need for solid economic analyses[149]. When it is compared with the existing policy of the Commission some short-

[149] Since the existing procedures are summarized in the third chapter it is appropriate to quote the proposed alternative here:

> "1. Is the actual beneficiary of the aid (in the case of *ad hoc* aids) or any of the likely beneficiaries (in the case of generic schemes) in a position to exert significant market power in either output or input markets? If not, the aid can be declared legal.
>
> 2. If the answer to question 1 is 'yes', would this market power, in conjunction with the granting of the aid, create a significant net negative cross-border externality? If not the aid can be declared legal.
>
> 3. If the answer to question 2 is 'yes', is the rationale for the aid grounded in the alleviation of a domestic market failure (and is the aid an appropriate instrument, in quality and quantity, for that end?) The standard of proof required to answer this question positively needs to be somewhat higher for *ad hoc* aids than for generic schemes.
>
> 4. If the answer to question 3 'yes', and the aid is for greenfield investment, it can be declared legal.

comings such as the lack of market power analysis are identified[150].

As it can be seen the Besley and Seabright article is not only the first theoretical study examining the SA policy, but it is also a comprehensive policy-oriented analysis given that it both analyzed the application and proposes new rules. Therefore the importance of this article cannot be challenged.

However it still has some weaknesses. From the theoretical side, the model is based on locational externalities and intergovernmental competition; but all cases of SA cannot be explained with reference to these two factors. First, in several cases the aid receiving enterprises would not change their location and output decisions with or without the aid, but might not shift to, for example, environmentally friendly production technologies. Second, subsidization does not necessarily lead to a subsidy war between governments because of political and financial differences. From the policy-oriented dimension the proposed rules do not take into consideration political and administrative constraints. As argued at the conclusion of the third chapter the MSs collectively give political importance to certain justifications to government intervention in the markets and the proposed rules are likely to question this political weight attached to certain SAs. In relation to this it should also be stated that the authors have not taken into consideration possible positive cross-border externalities sufficiently. Moreover the Commission has restricted financial and human resources to deal with notifications and investigations. Therefore it is not possible to carry cost-benefit analyses for every case (Such analyses are already done for major cases.)[151]. Besley and Seabright's work has also been criticized for being too lax with subsidies[152].

> 5. If the answer to question is 3 'yes', and it is aid to an existing firm or firms, have the firm or firms concerned already received aid in respect of the claimed market failure in question? If not, the aid can be declared legal. If they have already receiced such aid, the aid is illegal.
>
> 6. If the answer to question 3 is 'no', the aid can be declared illegal unless it can be shown that there are significant benefits from permitting it that would outweight the cross-border costs (the burden of proof lying on the countr granting aid to show that such benefits exists)." (p. 38)

[150] For a recent presentation by Seabright that refers to new studies and cases see: Seabright, Paul. 2004. "Economic Analysis and State Aid Control". Workshop on Antitrust and Regulation, Lecce. Available from the World Wide Web: <http://www.iue.it/Personal/Motta/forum/Lecce/SEABRIGHT.pdf>.

[151] This fact will be reemphasized below.

[152] Besley, Timothy and Paul Seabright. op. cit.: pp. 43-47. The articles published in *Economic Policy* where Besley and Seabright article appeared include discussion sections representing the views of other authors.

David R. Collie has written four successive articles on the subject. The first article[153] aims to provide an explanation to the SA policy that covers both the desire of MSs to give subsidies and the desire of the Community to control these. Collie builds a model with a symmetric Cournot oligopoly in a customs union based on strategic trade policy[154]. However his model differs from the existing literature by arguing that subsidies can be collectively efficient if the subsidizing countries also consume the products. The subsidy war eliminates the distortion created by the sub-optimal market structure. But if there is another distortion in the economy, namely distortionary taxation, then the subsidy war can be inefficient again. Under distortionary taxation the welfare of a government is

$$W_i = V(P) + \pi_i - \lambda s_i x_i$$

where V(P) is the consumer surplus (a function of P, the price), π is profit which is the producer surplus, λ is the opportunity cost of government revenue, s is subsidy and x is production volume. Collie shows that there exists a range of values for λ where governments want to give subsidies and the multilateral prohibition of subsidies would increase total welfare.

Based on his model he argues that the EU should prohibit all subsidies. This conclusion, which is in a stark contrast with those of Besley and Seabright, is immature given that the author does not take into consideration the question of externalities sufficiently[155].

Moreover the values of λ have no meaning for an examination of SA policy since the policy is designed to protect intra-Community trade and not the public finances of MSs. Of course the author can legitimately-and naïvely-make a call for the reform of the policy and he does that by asking for a general ban; but then there is no point to limit the analysis

[153] Collie, David R. 2000. "State aid in the European Union: The prohibition of subsidies in an integrated market". *International Journal of Industrial Organization*, Volume 18: pp. 867-884. A related article by the same author is: Collie, David R. 2000. "A Rationale for the WTO Prohibition of Export Subsidies: Strategic Export Subsidies and World Welfare". *Open Economies Review*, Volume11: pp.229-245.

[154] The EC is in fact a common market, not a customs union; but Collie does not differentiate between these two levels of international economic integration, so the model is not affected.

[155] Collie deliberately ignores political issues in order to base his explanation on only economics. Anyway a political economic modelling would not challenge the essence of his argument on the prohibition of subsidies while an externality approach does.

within the context of a customs union. Instead a general argument could have been made and then extended to the special case of the SA policy of the EU.

Collie's three other articles on the subject build on this initial study. In his second article Collie relaxes his strict model[156]. Now the market structure can be either Cournot or Bertrand. Moreover firms produce differentiated products. The author shows that if the products are sufficiently close substitutes then the range of values for λ where governments want to give subsidies and the multilateral prohibition of subsidies would increase total welfare still exists. However if the products are sufficiently differentiated then the prohibition decreases total welfare.

Collie's latter finding is a non-result; because if the products are sufficiently differentiated then the products form different markets and the subsidies given to the production of one of them would not distort intra-Community trade and therefore not qualify as SAs. That is why in certain SA investigations relevant market analyses are carried out as done in abuse of dominant position, concerted action and mergers & acquisitions investigations.

In his third article on the subject Collie introduces international trade to the model[157]. Trade already exists between the countries in the model; but the countries have formed a customs union and eliminated all barriers to trade among themselves, so that trade is not international, but intra-Community. In the presence of international trade the original findings remain unaltered.

The fourth Collie article on the SA policy answers an important criticism by modifying the model[158]. The criticism is that production subsidies are operating aids that are usually prohibited and therefore investment and R&D subsidies are more relevant. According to Collie investment and R&D both reduce the marginal cost of production like production

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[156] Collie, David R. 2002. "Prohibiting State Aid in an Integrated Market: Cournot and Bertrand Oligopolies with Differentiated Products". *Journal of Industry, Competition and Trade*, Volume 2: pp. 215-231.

[157] Collie, David R. 2002. "Trade Liberalization and State Aid in the European Union" in Milner, Chris and Robert Read (eds.). *Trade Liberalization, Competition and the WTO*. Aldershot: Edward Elgar: pp. 190-206.

[158] Collie, David R. 2005. "State Aid to Investment and R&D". Economic Papers Number 231. Brussels: European Commission Directorate-General for Economic and Financial Affairs. Available from the World Wide Web: <http://europa.eu.int/comm/economy_finance>.

subsidies (This statement is somewhat doubtful since R&D projects sometimes fail; but this fact does not challenge the essence of the argument.). However they bring a cost of investment unlike production subsidies. The spill-over effects of R&D subsidies is a second difference. The government gives a per unit subsidy for this investment which is financed by taxation that can be distortionary as before. Collie limits the market structure with Cournot competition since as he cites a former study by Bagwell and Staiger has shown that the argument for R&D subsidies is not affected by the market structure unlike the case for export subsidies[159].

Collie explains that investment and R&D decisions can be given both strategically and non-strategically. The difference lies in the timing of output decisions. If investment and output decisions are made simultaneously then this is a non-strategic decision. If the output decision is given later then there is strategic decision-making. The author examines strategic investment and non-strategic R&D. He shows that prohibition of investment subsidies would always increase total welfare. What is striking is that unlike the case of production subsidies the value of λ does not matter. The reason is that investment subsidies use real resources to decrease marginal costs. This finding conflicts with the current application of the policy which permits most investment aids and prohibits production aids. The effect of the prohibition of R&D subsidies, on the other hand, depends on the magnitude of the spill-over. If the spill-over is small prohibition would always increase total welfare, is it is modest there exists a range of values for λ that would make it beneficial and if it is large prohibition would reduce total welfare. This finding supports the application of the policy and it can be extended to other types of subsidies such as environmental and regional subsidies[160]. It can be seen that Collie has started to take into consideration the question of externalities more seriously in his latest study; but the problem with the central importance of λ, the opportunity cost of government revenue in the model remains.

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[159] The cited study is the following: Bagwell, Kyle and Robert W. Staiger. 1994. The sensitivity of strategic and corrective R&D policy in oligopolistic industries". *Journal of International Economics*, Volume 36, Number 1: pp. 133-150.

[160] In the case of regional subsidies spill-overs would be larger in border regions. The existence of the Community initiative called INTERREG (currently INTERREG III) financed by the Structural Funds is based on this logic. Therefore the model can be advanced with a geographical component. following the new economical geography literature.

Collie's study has inspired that of Peter Møllgaard[161]. This author argues that most of SAs do not directly affect marginal costs and concentrates on sectors where investments that enhance demand are important. Examples to such sectors include airlines, train operators and broadcasters which Møllgaard models. In his complicated model oligopolistic firms are in a strategic competition for commercials where they first invest, for example, to program quality and viewer penetration and then compete à la Bertrand and then à la Cournot. One of the firms uses SA in investment. The impact of SA is not to lower marginal costs, but the cost of capital: the interest rates. The author shows that the aid recipient gains market share and becomes dominant. Therefore it charges higher prices and sells larger quantities in the presence of SA. SA can even be predatory, pushing the rival firm out of market.

Møllgaard's study shows that certain sectors might have characteristics that should be specifically examined. However his argument on marginal costs is not convincing since the impacts of all subsidies can be reduced to impacts on marginal costs. Møllgaard does not make any comments on the SA policy; but his conclusions show that SAs are distortive. Therefore the derived policy conclusion is that they should be prohibited.

While Møllgaard's study examines a specific sector Ela Glowicka studies a specific type of SAs, namely R&R aids[162]. As the author states R&R subsidies are particularly prone to distort competition since they are given to otherwise exiting firms. The competitors, if they need to, have to restructure with their own sources. Moreover these subsidies have not been studied in the strategic trade policy literature that forms the basis of Glowicka's model.

Another difference between Glowicka and conventional strategic trade policy literature is that in the latter consumer surplus is not taken into consideration (by assuming that the competing countries export to a third market). However Glowicka follows Collie in modeling the countries as selling to a unified common market (the international economic

[161] Møllgaard, Peter. 2005. "Competitive effects of state aid in oligopoly". Available from the World Wide Web: <http:// www.fep.up.pt/conferences/earie2005/cd_rom/Session%20VI/VI.H/ Mollgaard.pdf>. This is a working paper. The author has completed his model, but not the entire discussion.
[162] Glowicka, Ela. 2005. "Rescue and Restructure Subsidies in the European Union". WZB Economics and Politics Seminar Series. Berlin: Wissenschaftszentrum Berlin. Available from the World Wide Web: <http//:www.wz-berlin.de/mp>.

integration structure) and so takes into consideration consumer surplus. Both authors are able to make new arguments based on this consumer surplus factor.

The author builds a model that includes two countries that have formed a common market and two Cournot firms with asymmetric costs located in each of them. The countries share the common market proportionately to their populations. One of the firms decides to restructure with an investment of $\frac{d}{2}e^2$ in order to decrease its marginal costs by e. Then the firms compete à la Cournot. Under perfect information government 1 sees when would its firm exit the market and subsidize further restructuring with a subsidy equal to $\frac{d}{2}k^2$ in order to reduce the marginal costs of the firm by an additional k. The other government cannot subsidize its firm because of the SA rules. Therefore under the subsidy the profit of first firm is given by

$$\pi_{1s} = [a - (x_1 + x_2)]x_1 - (c_1 - e_1 - k_1)x_1 - \frac{d}{2}e_1^2$$

while the government maximizes the following objective function

$$W_{1s} = \pi_{1s} - \frac{d}{2}k_1^2 + \alpha CS$$

where CS stands for consumer surplus and α shows the proportion of common market the government in question has.

Glowicka shows that if the initial cost differences are low the R&R subsidy rescues the inefficient firm and increases the welfare of the country. If the cost differences are high then the subsidy fails to rescue the firm, "but provides a threat of entry to the efficient firm, which forces it to restructure more than an unconstrained monopoly would. This strategic behavior improves both productive and allocative efficiencies and would not happen without consumer orientation of the government." (p. 3).

A second result is that the externalities associated with the subsidy depends on the size of the subsidizing country (the size being captured by the population as shown above). If the country is small the subsidy can increase the welfare of both countries; but if the country is big the welfare of the other country decreases. These conclusions provide a rationale and therefore support the current policy application.

4.2. The Basics for a More Realistic Model

In this section the basics for a more realistic model of the SA policy is presented in a number of steps. These are only the basics because the model is kept as simple as possible and the mathematical results are not covered completely[163]. Some non-technical elaborations are carried out in step five.

4.2.1. Step One: A Cournot Duopoly

There are two main models of oligopolistic markets: Cournot and Bertrand competition. In the former one firms compete by setting output while in the latter one prices are set. The model developed below is a Cournot competition model under perfect information.

In order to keep the analysis simple a duopolistic market is envisaged[164]: There are two firms (i, j). They produce a homogenous product. The production quantities or outputs are q_i and q_j.

The demand function is linear. The inverse demand function is:

$$p = a - bQ = a - b\,(q_i + q_j) \qquad (1)$$

Fixed costs do not exist; so the production costs consist of just marginal costs. There is symmetry between the firms. This means that they face equivalent marginal cost curves. There are constant returns to scale; so marginal cost curves are linear.

$$C(q_i) = cq_i \qquad (2)$$

Therefore profit of firm i is:

$$\pi_i = [a - b\,(q_i + q_j)]\,q_i - cq_i \qquad (3)$$

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[163] For the mathematical methods utilized in this section consult: Sydsaeter, Knut and Peter J. Hammond. 1995. *Mathematics for Economic Analysis*. USA: Prentice Hall.

[164] For Cournot competition in a duopolistic setting see: Brander, James A. *op. cit.*: pp. 9-15; Cabral, L. op. cit.: pp. 107-124.

The firms hold Cournot's conjunctions, i.e. they set their outputs to maximize their profits and believe that the other firm also does so. Therefore the profit functions of the firms are also called reaction functions or best-response functions (Firm i sets output q_i taking into consideration q_j.). The firms reach equilibrium at the intersection of their reaction functions. The output decisions are made simultaneously.

In order to find out the equilibrium one has to find the outputs of firms. Given formula (3), the profit maximizing output of firm i can be calculated by first taking the partial derivative of the equation with respect to q_i (since there are more than one variables) and then setting it equal to zero. This is called the first order condition (FOC). Using the sum and product rules for taking derivatives the solution is as follows:

$$\partial\pi_i/\partial q_i = -bq_i + a - b(q_i + q_j) - c = 0 \qquad (4)$$

Therefore output of firm i equals

$$q_i = \frac{a-c}{2b} - \frac{q_j}{2} \qquad (5)$$

while that of firm j equals $q_j = \frac{a-c}{2b} - \frac{q_i}{2}$.

By simple substitution the solution of the system of these two outputs yields the following:

$$q_i = q_j = \frac{a-c}{3b} \qquad (6)$$

Total output equals to $2\frac{a-c}{3b}$. This equilibrium is a Nash equilibrium. In other words there is no other equilibrium that is more beneficial for both of the parties[165]. It is called as the Cournot or the Cournot-Nash equilibrium.

[165] It is possible to have more than one Nash equilibrium in some games; but this is not the case in the present game.

In the Cournot duopoly the outputs of the firms are strategic substitutes. If the output of one firm increase that of the other would decrease. Since the profits are functions of outputs they are also affected. This can be demonstrated formally by using second partial derivatives. In the case of firm i: $\frac{\partial^2 \pi_i}{\partial_{q_i} \partial_{q_j}} \langle 0$. The profit of firm i decreases if the output of firm j increases.

4.2.2. Step Two: Cost Reduction Investment

In the first step there was cost symmetry between the firms. Under cost asymmetry the results are different[166]. If one of the firms can cut down its costs, it can raise its market share. It is assumed that the other firm cannot cut down its costs (Possible reasons include a budget constraint and rational ignorance.).

Firm i decides to cut down its costs, c, by a margin. In order to do so it needs to make investment. In the modeling of investment Collie's latest study is followed with a modification in the cost function. Cost reduction equals to $c - \theta x_i$ where x_i is investment of firm i and θ shows the magnitude of cost reduction created by the investment. The cost of investment is quadratic as frequently assumed in the literature: $\frac{\sigma}{2} x_i^2$. Following this cost-reducing investment the profit function of firm i becomes:

$$\pi_i = [a - b\,(q_i + q_j)]q_i - (c - \theta x_i)q_i - \frac{\sigma}{2} x_i^2 \qquad (7)$$

As stated above parties can undertake investment strategically or non-strategically depending on the timing of the investment and output decisions. The non-strategic case is simpler; but the strategic case is more realistic and more widely used in the literature. In this case firm i first makes the investment decision and then both firms make their output decisions (As stated above it is assumed that firm j cannot make investment.); so there is a multistage game instead of a single-shot game. Multistage games are solved by backwards

[166] For other types of asymmetries and a discussion on this specific issue see: Röller, Lars-Hendrik and Bernard Sinclair-Desgagné. 1996. "Asymmetry in Cournot Duopoly". Série Scientifique 96s-23. Montréal: Centre interuniversitaire de recherche en analyse des organisations.

induction in order to obtain a sub-game perfect Nash equilibrium[167]. The FOC for q_i is as follows:

$$\partial\pi_i/\partial q_i = -bq_i + a - b(q_i + q_j) - c + \theta x_i = 0 \quad (8)$$

So q_i is:

$$q_i = \frac{a - bq_j - c + \theta x_i}{2b} \quad (9)$$

The FOC for q_j does not change: $q_j = \frac{a-c}{2b} - \frac{q_i}{2}$. By substitution the system of these two outputs is solved to obtain the following:

$$q_i = \frac{a - c + 2\theta x_i}{3b} \quad (10)$$

$$q_j = \frac{a - c - \theta x_i}{3b} \quad (11)$$

It is clear that investment x_i increases the output of firm i and decreases that of firm j. Therefore cost-reducing investment and output in a firm are strategic complements.

In order to see the effect of the increase of x_i on p_i and p_j formally, the partial derivates of these production functions should be taken with respect to x_i. These operations give the following results:

$$\partial q_i/\partial x_i = \frac{2\theta}{3b} \rangle 0 \quad (12)$$

[167] The lack of strategic interaction in the first stage does not challenge the nature of the problem. For basic game theoretic methods see: Morrow, James D. 1994. *Game Theory for Political Scientists*. New Jersey: Princeton University Press (This book studies the application of game theory to political science themes; but the basics methods do not change among disciplines.).

$$\partial q_j/\partial x_i = \frac{-\theta}{3b} < 0 \qquad (13)$$

After solving the output stage (second stage) of the game it is turn for the investment stage (first stage). Since there is perfect information firm i anticipates its output decision while making the investment decision. Therefore rearranging (9) to obtain $2bq_i$ and substituting this to (7) one can get the following profit function for the first stage[168]:

$$\pi_i = bq_i^2 - \frac{\sigma}{2}x_i^2 \qquad (14)$$

Since q_i is obtained using x_i as shown in (10) the FOC of x_i includes a partial derivative of q_i with respect to x_i:

$$\partial\pi_i/\partial x_i = 2bq_i(\partial q_{i'}/\partial x_i) - \sigma x_i = 0 \qquad (15)$$

Substituting from (9) and (12) and arranging, x_i equals to:

$$x_i = \frac{4\theta(a-c)}{9b\sigma - 8\theta^2} \qquad (16)$$

If the assumption that only firm i can make cost-reducing investment were lifted then the two firms would make the same level of investment. Therefore investment would not have had an impact on market share.

4.2.3. Step Three: Strategic Trade Policy

In the first two steps the Cournot duopoly is examined in isolation. In the present sub-section this duopoly is transferred to an international context in order to demonstrate strategic trade policy.

[168] This substitution is taken from Collie. Explanations about the mathematical operations that Collie omitted are given.

As Brander explains there are two types of strategic trade policy models with respect to consumer surplus: third-market models and reciprocal market models[169]. In the former type competing countries export the goods whose production is supported to a third market. Therefore there is no need to take into consideration consumer surplus. In third-market models the domestic government cannot do anything to hinder the production of the competing country and only the strategic effects of the policies are observed. In reciprocal market models there is domestic consumption of the goods produced by the supported industry; so consumer surplus is taken into consideration. One of the main characteristics of these models is market segmentation. In applications to the EU, market segmentation does not exist (as in Glowicka) or has no impact (as in Collie). For simplicity a third-market model is used below; but consumer surplus is also discussed to show the underlying mechanism of exchange.

Assume the following story: Three identical countries (A, B, C) form a common market; so all barriers to trade are annulled between the parties. A symmetric Cournot duopoly (firms i, j) that produces a homogenous good operates in this setting. Firm i is located in A and firm j is located in B. Both firms export all of their production to C. There is no consumption of this homogenous good in A or B.

There is a single factor of production in all three countries: labor. The entire population works. In A and B labor can be used to produce either the homogenous good by the Cournot duopolists or a numeraire good[170]. Numeraire good is produced with constant returns to scale under perfect competition. One unit of labor produces one unit of either good. Labor is paid its marginal product. Therefore no profits arise from the production of the numeraire good and there is no income difference for labor between the sectors (Note that profits arise from the production of homogenous good because of imperfect competition.). Also labor can move freely between them. Consumers in A and B only consume the numeraire good. A and B import this good from C in exchange for the homogenous good in what Brander calls "'behind-the scenes' trade" (p. 13).

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[169] Brander, James A. *op. cit.*: pp. 9-15, 37-38.

[170] A numeraire good is a good whose world and domestic prices are equal and normalized to one. It absorbs all income effects and therefore is a standard feature of international trade models. For a mathematical overview of international trade theory see: Strulik, Hulger. 2005. "International Political Economy: Lecture Notes". Available from the World Wide Web: <http://www.econ.ku.dk/strulik/teaching/ipe>.

Country A has a labor endowment of P, that stands population, shared by the two sectors. Assuming that the profits of firm i are distributed among the laborers the domestic welfare (W) of A (that equals to the consumption of the numeraire good) is the following:

$$W = P + \pi_i \tag{19}$$

A has a government (G). Assuming that G is a benevolent government, i.e. a government whose objective function is identical to the domestic welfare function of the country, strategic trade policy literature argues that it can intervene in the oligopolistic market in order to increase the welfare of the country by shifting profits from rival firms to domestic firms (See page 21 above.). Giving a subsidy to the domestic firm is the most common way of doing it.

Since P is a fixed endowment that can be ignored in the mathematical analysis, under strategic trade policy domestic welfare of A becomes

$$W = \pi_i - S \tag{20}$$

where S is the subsidy given by G. It is assumed that the subsidy is financed by non-distortionary means. Otherwise s_i would be explicitly multiplied by a parameter (usually λ as in Collie's studies) in the above equation (Here it is implicitly set as one.). (20) implies that if S can raise π_i more than its own value then it is rational for G to give the subsidy.

In the previous sub-section it was shown that a cost-reducing investment by firm i increases its output and decreases that of its rival; but if both firms could invest then investment would not have an impact on market share. In this sub-section the aim is to show the effect of a strategic subsidy; so firm j is allowed to invest as well.

Firms invest strategically; therefore they play a two-stage game among themselves. Strategic trade policy adds a new stage to this game. In this new initial stage G makes a decision about subsidizing firm i. It is assumed that firm j receives no subsidy from its own government. Following that firms first make investment choices in stage two and

then output choices in stage three; so firms make their choices under government commitment[171].

The subsidy in question is given proportionately to the cost-reducing investment by firm i[172]:

$$S = s_i.x_i \tag{21}$$

Therefore the profit function of the firm i becomes:

$$\pi_i = [a - b\,(q_i + q_j)]q_i - (c - \theta x_i)q_i - \frac{\sigma}{2}x_i^2 + s_i.x_i \tag{22}$$

Since firm j can also make investment now the entire game should be resolved. The FOC for q_i and the profit maximizing value of q_i remains as in (8) and (9):

$$\partial\pi_i/\partial q_i = -bq_i + a - b\,(q_i + q_j) - c + \theta x_i = 0$$

$$q_i = \frac{a - bq_j - c + \theta x_i}{2b}$$

However since firm j can invest now the value of q_j is:

$$q_j = \frac{a - bq_i - c + \theta x_j}{2b} \tag{23}$$

As before by substitution the system of these two outputs is solved to obtain the following values:

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[171] The lack of government commitment complicates strategic trade policy and usually used to show that it is inefficient. For example see: Leahy, Dermot and J. Peter Neary. 1996. "International R&D rivalry and industrial strategy without government commitment". *Review of International Economics*, Volume 4: pp. 322-338.

[172] Glowicka uses a different model where the government first observes the market and then gives a subsidy which is not proportional to the investment already undertaken by the firm. See: Glowicka. *op. cit.*: p. 4.

$$q_i = \frac{a - c + 2\theta x_i - \theta x_j}{3b} \tag{24}$$

$$q_j = \frac{a - c + 2\theta x_j - \theta x_i}{3b} \tag{25}$$

It is again clear that investment by one firm has a negative effect on the output of the other. Results (12) and (13) are still valid; but now the partial derivates of the production functions taken with respect to x_j give the same results:

$$\partial q_i/\partial x_i = \partial q_j/\partial x_j = \frac{2\theta}{3b} \rangle 0 \tag{26}$$

$$\partial q_j/\partial x_i = \partial q_i/\partial x_j = \frac{-\theta}{3b} \langle 0 \tag{27}$$

After solving the output stage (which is now the third stage) investment stage (now second stage) can be solved as before. Rearranging (9) to obtain $2bq_i$ and substituting this now to (22) the following profit function is obtained for firm i:

$$\pi_i = bq_i^2 - \frac{\sigma}{2} x_i^2 + s_i x_i \tag{28}$$

The profit function for firm j is also modified by rearranging (23) and substituting. Since this firm is not given subsidies its profit function is similar to (14):

$$\pi_j = bq_j^2 - \frac{\sigma}{2} x_j^2 \tag{29}$$

The FOCs for x_i and x_j are respectively given in (30) and (31):

$$\partial \pi_i/\partial x_i = 2bq_i(\partial q_i/\partial x_i) - \sigma x_i + s_i = 0 \tag{30}$$

$$\partial \pi_j/\partial x_j = 2bq_j(\partial q_j/\partial x_j) - \sigma x_j = 0 \tag{31}$$

Substituting from (24) and (25) and arranging x_i equals:

$$x_i = \frac{4\theta a - 4\theta c - 4\theta x_j + 9bs_i}{9b\sigma - 8\theta^2} \tag{32}$$

Substituting from (25) and (26) and arranging x_j equals:

$$x_j = \frac{4\theta a - 4\theta c - 4\theta x_i}{9b\sigma - 8\theta^2} \tag{33}$$

By comparing (32) and (33) it can be seen that (1) investment by one firm has a negative impact on the investment of the other and (2) subsidies given by G to firm i has a negative impact of firm j.

The solution of the above system of investments which is obtained by substitution is messy[173]; so the results are provided with the assistance of an additional symbol (Δ) below:

$$x_i = \frac{(4\theta a - 4\theta c)(\Delta - 4\theta) + 9bs_i\Delta}{\Delta^2 - 16\theta^2} \tag{34}$$

$$x_j = \frac{(4\theta a - 4\theta c)(\Delta - 4\theta) + 36bs_i}{\Delta^2 - 16\theta^2} \tag{35}$$

Δ is ($9b\sigma - 8\theta^2$). (34) and (35) respectively give the optimal values of investment for firm i and j when they are anticipating the output decisions.

In order to determine the effect of the subsidy provided by G on the investment level the partial derivatives of investment function should be taken with respect s_i. These are as follows:

[173] There seems to be a trade-off between the specification of market structure and corresponding functions and the complexity of algebraic work; so using a Cournot duopoly enables one to show results that are both clear and messy.

$$\partial x_i/\partial s_i = \frac{9b\Delta}{\Delta^2 - 16\theta^2} \rangle 0 \quad (36)$$

$$\partial x_j/\partial s_i = \frac{36b\Delta}{\Delta^2 - 16\theta^2} \langle 0 \quad (37)$$

As the investment stage (second stage) of the game is solved the first stage can be examined now. Like other conventional strategic trade policy models the first stage involves a different player, G. G decides on the optimal level of the subsidy in order to maximize its objective function. Of course this level can be zero. In some cases it can also be negative, i.e. a tax (Hence comes the definition of a subsidy as a negative tax.).

The objective function of G is currently identical to the domestic welfare function W. Substituting (21) to (20) domestic welfare is:

$$W = \pi_i - s_i.x_i \quad (38)$$

This function is more complicated than it seems; because it is a function consisting of composite functions. Using a notation given by Brander it can be rewritten in the following way[174]:

$$W = \pi_i (q_j, q_i, x_i, x_j, s_i) - s_i x_i(q_j, q_i, x_j, s_i)$$

Since the values for outputs and investment are obtained these can be substituted to the domestic welfare function in order calculate the FOC for s_i[175]:

$$\partial W/\partial s_i = 0 \quad (39)$$

The outcome is too complicated to be reported; but there is a value for s_i that increases the profits of firm i and hence domestic welfare more than its cost ($s_i x_i$).

[174] Brander, James A. op. cit.: p. 13.

[175] Of course it is possible to use a more sophisticated optimization technique by taking the total differentials of previous FOCs, the total derivative of profit function and that of domestic welfare, and then making the necessary substitutions. Operations can be demonstrated in an easier way using this technique; but it is more difficult to follow.

However if the assumption that the government of B does not give subsidies to firm j were lifted (29), (31), (33), (35) and (37) would have to be modified. The resulting symmetry would lead the government of B to subsidization. Therefore the governments would engage in a subsidy war. Then at the equilibrium subsidies would not shift profits and be collectively wasteful (The cost-reducing effect of investments is preserved.). The governments would find themselves in a Prisoners' Dilemma. This finding is one of the central results of strategic trade policy. It holds for all or most values in all models. Since there is symmetry in the above model the welfare loss would be equal in A and B; so total welfare loss for the common market would be 2S.

4.2.4. Step Four: State Aids Policy

In the first three steps a strategic trade policy model with a Cournot duopoly operating in an integrated market was developed. This exercise is carried out in order to provide a model that can explain the SA policy of the EU that was described and analyzed in the third chapter.

As explained there the SA policy is a supranational one that has two institutional Community processes: legislative and executive. The legislative process lays down the main rules of the policy. The executive process produces decisions on specific cases.

The rationale of the SA policy was already explained at the beginning of the third chapter. Therefore it is not necessary to re-examine this issue here. However it should be noted that since in the above model a subsidy war leads to symmetric domestic welfare losses A and B have incentive to co-operate in order to pre-commit themselves not to giving subsidies[176]. Given the Prisoners' Dilemma in order to enforce co-operation among themselves they need a device. The executive process or in other words the executive competence of the European Commission serves as the device in the case of SA policy.

European Commission can be conceived as an agency in the context of SA policy (and in general competition policy). This term captures both the underlying principal-agent

[176] How about C? Assuming that the numeraire and duopoly good are perfect substitutes for the consumers in C this country would be indifferent.

relationship and the wide and diverse literature on regulation by specialized executive branches of the government[177].

There are different assumptions about agency behavior. The usual assumption is that agencies maximize social welfare[178]. However this assumption is not satisfactory for explaining the behavior of the Commission in SA policy; because the Commission is not trying to weight the costs and benefits of subsidy decisions or schemes. Instead it evaluates their compliance with the provisions of the Treaty using a margin of discretion. Quantative cost-benefit analysis is seldomly used (and only for large scale SAs). In general economic analyses are carried out to see whether planned or unnotified SAs are legal or not[179].

Therefore it can be stated that the Commission is maximizing compliance instead of social welfare. However it is not simply maximizing compliance itself, it is maximizing the benefits of compliance[180]. The benefits of compliance arise from free competition in the SEM; so the Commission does not spend time on small cases such as individual agricultural SAs and concentrates on major cases such as R&R projects.

Moreover it would not be fair to criticize the Commission for not maximizing social welfare; because (1) in the context of principal-agent relationship it is asked to enforce rules and (2) it has limited human and financial resources[181]. Therefore it is constrained in two different ways.

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[177] Naturally the term should not be evaluated within the constitutitonal-institutional setting of the EU. EU has more than two dozen "agencies" specialized on different fields.

[178] For a review see: Cohen, Mark A. 1998. "Monitoring and Enforcement of Environmental Policy". Available from the World Wide Web: <http://www.vanderbilt.edu/VCEMS> (Also available from the World Bank, but in a less user-friendly format.). This review is not restricted to environmental policy literature and its results can be generalized. Also agencies might be given different social welfare criteria such as consumer surplus and total welfare standards. See: Neven, Damien J. and Lars-Hendrik Röller. 2000. "Consumer Surplus vs. Welfare Standard in a Political Economy Model of Merger Control". Discussion Papers FS IV 00-15. Berlin: Wissenschaftszentrum Berlin. Available from the World Wide Web: <http//:www.wz-berlin.de/mp>.

[179] Remember that Besley and Seabright criticize this fact and propose a new algorithm of rules (see page 55).

[180] For the difference and economic implications see: Cohen, Mark A. *op. cit.*: pp. 10-11.

[181] Even if the Commission had all the necessary resources it is doubtful whether the practical application of social welfare maximization which requires cost-benefit analyses would be efficient or not. An interesting case study is forest management under United States National Environmental Policy Act of 1969 that required federal agencies to assess the impact of their policies on people and the environment:

Omit initially for simplicity that the Commission is maximizing the benefits of compliance and concentrate on the rules. SA rules can be simplified as probiting trade-distorting production subsidies unless they bring commonly accepted benefits of an equivalent scale. It can further be reduced to a cost-benefit analysis. Therefore the decisions of the Commission can be characterized by

$$D = \left\{ \begin{array}{l} 0 \text{ if } | B \pm \varepsilon | \leq | C \pm \varepsilon | \\ 1 \text{ if } | B \pm \varepsilon | > | C \pm \varepsilon | \end{array} \right\} \quad (40)$$

where D stands for decision (0, 1), B for benefit and C for cost[182]. The decision of the Commission is either prohibiting (D = 0) or permissing (D = 1) the SA. Since the Commission actually conducts cost-benefit analyses seldomly it does not know the exact costs and benefits of a SA. Instead it makes enlightened guesses about the relative scales of costs and benefits. These guesses might not be true; therefore "$\pm \varepsilon$"[183].

It should be noted that the behavior of maximization of the benefits of compliance could be captured by assuming that ε is a decreasing function of the SA. Therefore total errors would be reduced as the size of the subsidy increases. This is an efficient property since those SA decisions or schemes that create the least benefits are more likely to be erroneously prohibited. As a result MSs would have more incentive to take/design clearly

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"The planning process has been difficult and contentious. Congress mandated that all plans should be finished in 1985. (...) By 1985, fewer than half of the 123 plans had been published in final form and more than 20 had not been issues in draft form. Until recently, ant person or group, for the price of postage, could appeal a local plan to the agency (or ultimately to the courts). (...) The entire planning process was consuming over $200 million annually, 16 percent of the entire Forest Service budget and nearlt twice the budget for wildlife, fish, range, soil and water management."

See: MacNair, Douglas and Thomas P. Holmes. 1998. "An Empirical Evaluation of Reference Points, Loss Aversion and Economic Efficiency in Bureaucratic Decision-Making". TER Technical Working Paper No. T-9803. Available from the World Wide Web: <http://www.ter.com>: pp. 4-5. It is clear that the marginal social cost of planning exceeds its marginal social benefit in this case study as the planning activities have a crowding-out effect on the financial resources for the actual tasks of the agencies.

[182] For a similar characterization see: Neven, Damien J. and Lars-Hendrik Röller. *op. cit.*: p. 7. Neven and Röller assume social welfare maximizing (but captured) agency behavior; so they can directly link the decision to the utility of the agency. The behavioral assumption here makes the present sub section partially phase out of the rest of the model; but it is a very realistic approach to the actual policy.

[183] It is possible to state that the administrative and quantitative limits imposed by the secondary law and soft law produced by the Commission aim to decrease the uncertainity surrounding SA decisions in the light of the experience gained through these guesses.

beneficial decisions/schemes. Moreover there is no trade-off between type I (prohibiting beneficial SAs) and type II (permissing harmful SAs) errors.

The Commission is assumed to prohibit the SA when the benefits and costs are (approximately) equal since the agency desires to decrease the total level of SA given in the Community. This is also consistent with the behavior of maximization of the benefits of compliance.

Referring to the model above the cost is given by the effect of s_i on π_j, which is too complicated to be reported, but obviously negative given (37). s_i benefits firm i and therefore G; but these benefits are not among those commonly accepted (and so listed in Article 87 of the Treaty). Therefore B is zero and so is the value of D.

As it can be seen the strategic trade policy model developed in the first three steps leads to the prohibition of subsidies because of the behavior of the Commission. Moreover this behavior seems to be pretty efficient. However it is observed that most of SA notifications give positive results, that is SA decisions and especially schemes are given permission. In order to explain this empirical phenomenon the above model has to be extended to include externalities.

4.2.5. Step Five: Externalities

Non-reciprocal externalities, i.e. externalities other than those on rival firms and countries caused by strategic interaction, have not been discussed much in the strategic trade policy literature (The relationship between strategic environmental and trade policy is an exception[184].). Therefore an original formulation based on the model developed in the first three steps is presented below.

Assume that the production of the duopoly good by firm i creates a non-pecuniary production externality in A without any cross-border spill-overs. Since it is non-pecuniary the externality enters the domestic welfare function of the country A that becomes:

[184] The discussion of this issue has started with the following study: Conrad, Klaus. 1993. "Taxes and subsidies for pollution-intensive industries as trade policy." *Journal of Environmental Economics and Management,* Volume 25: pp. 121-135.

$$W = P + \pi_i + E \quad (41)$$

where E stands for externality. The welfare effect of externality is equally distributed among the consumers. There is no externality generation in B.

Further assume that the externality is linearly associated with the output of firm i. One unit of externality is created by one unit of the duopoly good produced. The externality function is as follows:

$$E = e_i q_i \quad (42)$$

In practice it is difficult to calculate precisely the welfare impact of an externality and therefore design optimal policies for internalization. However the simplicity of the model allows us to do so with two more assumptions, namely (1) the assumption that the value of the externality is equal to that of the numeraire good and (2) the assumption that the externality can be internalized by another production process that has the same characteristics with those of the numeraire good[185].

First take into consideration a negative externality. Firm i produces q_i of the duopoly good and therefore $e_i q_i$ of the negative externality that can, for example, be emission. There are two methods of internalizing this externality: internalization through another production process (in the case of emission an abatement sector) and internalization through government intervention.

Take into consideration the latter option first. Governments can intervene in a number of ways. The most efficient one is to use a Pigovian tax (subsidy) internalizing the negative (positive) externality[186]. G can alter the profit function of firm i by imposing a tax t on q_i[187]:

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[185] In fact the last assumption can be omitted from the analysis; but it faciliates the conceptional dimension of the modelling exercise.

[186] This is of course a simplification. In certain cases other instruments such as two-part instruments should be used. For example see: Fullerton, Don and Robert D. Muhr. 2002. "Suggested Subsidies are Sub-Optimal Unless Combined with an Output Tax". National Bureau of Economic Research Working Paper No. 8723. Available from the World Wide Web: <http://www.nber.org/papers/wp8723>.

[187] This equation is not part of the model; so it is not numerated.

$\pi_i = [a - b\ (q_i + q_j)]\ q_i - cq_i - t\ e_i q_i$

This would reduce output and therefore the negative externality. However it would also reduce total domestic welfare. The reason is that labor has the same productivity in the production of numeraire good, that of the duopoly good and the internalization of the negative externality. However the duopoly good is not produced under perfect competition that characterized the other sectors and therefore q_i is charged more than its marginal cost (so firm i has profits that are then distributed to the laborers). Therefore one unit of the production of the duopoly good has a value greater than one unit of internalization of the negative externality; so G, being a benevolent government, does not tax the production of the duopoly good.

As a result the society in A has to live with $e_i q_i$ or internalize it through the "abatement sector" (or any point on the continuum between these two extremes). In all cases the welfare loss is the same; but what is it? How can the welfare loss created by $e_i q_i$ be quantified? The answer is by reference to P, the labor endowment of A. If the proportion of P working for firm i is λ–given that one unit of externality is created per one unit of the good produced, one unit of labor produces one unit of the duopoly good (Note that the model is static.) and labor has same productivity in the production of the duopoly good and the internalization of the externality–then the welfare loss associated with the externality is given by λP. Therefore the domestic welfare function becomes:

$$W = P + \pi_i - \lambda P = (1 - \lambda)P + \pi_i \qquad (42)$$

Since one unit of labor produces one unit of the duopoly good, the numerical value of λ is straightforward[188]:

$$\lambda = \frac{q_i}{P} \qquad (43)$$

[188] So why is λ used at all? The reason is that otherwise the numerical value of q_i might be mixed with the market price of the q_i amount of the duopoly good as the domestic welfare founction would be reduced to $P + \pi_i\ q_i$.

Next consider a positive externality. The story is very similar to that of negative externality: Firm i produces q_i of the duopoly good and therefore $e_i q_i$ of the positive externality that can, for example, be a locational externality. As assumed the unit value of this externality and that of the numeraire good are equal to each other and the same externality can be obtained through another production process that has the same characteristics with those of the numeraire good. Therefore the social welfare gain associated with the externality is given by λP. The domestic welfare function is[189]:

$$W = P + \pi_i + \lambda P = (1 + \lambda)P + \pi_i \qquad (44)$$

The optimal policy for internalizing this externality is increasing q_i. Assuming that q_i can be increased without any costs the maximizing numerical value of q_i would be P, i.e. everybody in A would work form firm i[190]. Then domestic welfare would become $2P + \pi_i$ instead of $P + \pi_i$, the case without a positive production externality.

What are the implications of externalities for strategic trade policy? In the case of the negative externality increasing the output of firm i would also increase proportionately the amount of the negative externality generated. Therefore the profit obtained by an additional unit of output should not only be greater than the subsidy given for this purpose, but the sum of the corresponding subsidy and the negative externality generated; so if the profit margin is not wide enough the optimal subsidy would be zero (but not negative). In general:

$$\partial W/\partial s_i > \partial W_N/\partial s_i \qquad (45)$$

where subscript N stands for negative externality.

In the context of the EU's SA policy the Commission would prohibit any subsidies under these conditions. Note that from the Commission's viewpoint the existence of the negative

[189] A weakness of the current conceptionalization of externalities is that negative and positive exterenalities cannot be captured with the same equation.

[190] Assume on the sideline that entry to the numeraire good market is free; therefore firm i cannot benefit from being a monopsonist in the labor market through bidding wages down.

externality has not changed the analysis. Therefore the case of a positive externality is more interesting here.

The existence of a positive externality makes the subsidy more beneficial. In general:

$$\partial W/\partial s_i < \partial W_P/\partial s_i \qquad (46)$$

where subscript P stands for negative externality.

Indeed the subsidy would be beneficial even if there were no profit-shifting effects as long as the value of the positive externality generated by one additional unit of output is greater than the subsidy given for this purpose. Therefore from a domestic welfare perspective the existence of positive externalities legitimizes subsidization under perfect competition or under symmetric strategic trade policy, that is even when there is a subsidy war.

What are the values for B and C that enter the decision-making algorithm of the Commission? The cost is the impact of s_i on π_j and the benefit is the impact of s_i on E. Commission omits from its analysis the impact of the subsidy on π_i.

First take into consideration C. As stated in the previous sub-section the impact of s_i on π_j is too complicated to be reported. However in the present step the aim is to show the impact of externalities on the model; so it is appropriate to simplify by assuming that firm j refuses to make investment (and therefore the government of B cannot subsidize even at $s_i = 1$.).

Re-solving step three with this assumption yields manageable figures. Since firm j does not invest, the solution of the system of output functions remains as in (10) and (11):

$$q_i = \frac{a - c + 2\theta x_i}{3b}$$

$$q_j = \frac{a - c - \theta x_i}{3b}$$

Therefore the effect of the increase of x_i on p_i and p_j, which were given by (12) and (13) in step two, does not change either:

$$\partial q_i/\partial x_i = \frac{2\theta}{3b} > 0$$

$$\partial q_j/\partial x_i = \frac{-\theta}{3b} < 0$$

The profit function of firm i stays as in (28) in the third step (while that of firm j changes):

$$\pi_i = bq_i^2 - \frac{\sigma}{2}x_i^2 + s_i x_i$$

The FOC for x_i is given by:

$$\partial \pi_i/\partial x_i = 2bq_i(\partial q_i/\partial x_i) - \sigma x_i + s_i = 0$$

Substituting from (10) and (12) and rearranging:

$$x_i = \frac{4\theta a - 4\theta c + 9bs_i}{9b\sigma - 8\theta^2} \qquad (47)$$

Since there is no investment by firm j there is no system of investment functions to solve. The effect of s_i on x_i becomes:

$$\partial x_i/\partial s_i = \frac{9b}{\Delta} > 0 \qquad (48)$$

Remember that Δ is $(9b\sigma \ \ 8\theta^2)$.

Since the profit of firm j, which equals domestic welfare of B, is

$$\pi_j = [a - b\,(q_i + q_j)]\,q_j - cq_j$$

after substituting, arranging and taking the partial derivative with respect to s_i it is possible to see the effect of s_i on the profits of firm j (which is still complicated):

$$\partial x_j/\partial s_i = \frac{-6a\theta\Delta + 24\theta^2 a - 24\theta^2 c + 54 s_i}{\Delta^2} \langle 0 \qquad (49)$$

After finding out C it is turn for B, which is the impact of s_i on E. E equals $e_i q_i$. Since e_i is numeraire the value for E is simply q_i. The same result can be reached through (42). Since λ is equal to $\frac{q_i}{P}$ λP is in fact q_i.

Therefore in order to find the impact of s_i on E one should determine the impact of s_i on q_i. This can be done by substituting the value of x_i (47) in the equation for q_i (10), solving and taking the partial derivative with respect to s_i:

$$\partial q_i/\partial s_i = \frac{27}{3\Delta} \rangle 0 \qquad (50)$$

Given (49) and (50), that is C and B, Commission would make its decision after doing the below calculation

$$\left| \frac{27}{3\Delta} \right| \left| \frac{-6a\theta\Delta + 24\theta^2 a - 24\theta^2 c + 54 s_i}{\Delta^2} \right|$$

with an error margin of 2ε. If the outcome is positive D = 0, if the outcome is negative D = 1.

The above calculation enables the Commission to see the net benefit or the net cost of the SA decision or scheme from the perspective of Community politico-legal order (If the Commission were a social maximizing agency rather than a compliance maximizing one, its objective function would consist of the sum of the welfare of the MSs and so it would also take into consideration the impact of the subsidy on π_i.).

Therefore the above model shows that EU's SA policy is designed to prevent MSs from giving subsidies that have distortive effects in the context of European economic integration unless they are otherwise acceptable, i.e. the hypothesis of the present study is supported.

* * *

Several elaborations can be made to the model as it is presented above. First of all, the assumption that the externalities do not have any cross-border spill-overs can be lifted. In this case their impact on total welfare of the common market would be greater than their domestic values. More formally if the degree of the spill-over is measured by ϕ, with $0 < \phi < 1$, than the impact of the externality on total welfare would be given by $(1 + \phi)E$. This would not change the (D = 0) decision in the case of a negative externality; but it would decrease the possibility of a type II error. In the case of a positive externality the optimal domestic subsidy might be less than the optimal common market subsidy[191].

However it should be stated that even though it is very important from a welfare economics perspective this elaboration might not have any meaning on the modeling of the actual decision-making; because to the best-knowledge of this study the Commission has not taken into consideration cross-border spill-overs in its decisions. Of course this elaboration can still be used to criticize the application of the policy.

Another possible elaboration would be to model investment x_i not only as cost reducing (by θx_i), but also as externality reducing (enhancing) in the case of negative (positive) externalities. If so the negative externality can be at least partially internalized by means of the investment subsidy. This might lead to a (D = 1) decision by the Commission.

It should be reminded that Collie has modeled the difference between investment and R&D aids in his latest study by using a spill-over co-efficient. This study takes into consideration investment subsidies only; but the R&D subsidies can also be evaluated using the two elaborations explained above.

[191] Note that interesting welfare and policy implications would arise if ϕ is allowed to be with $1 < \phi < 1$.

These two of the possible elaborations are related to the externalities themselves. The rest are related to the decision-making mechanism of the Commission. The agency is given two options in the model: to prohibit or to permiss. In fact it can and does give a third type of decision: partial prohibition[192]. Therefore D can be constructed as a continuum ($0 \leq D \leq 1$) rather than a dichotomous variable. Then the Commission would limit the SA with a level that maximizes the net benefit. However this elaboration has limited application to actual cases since some SAs are not incremental or might not be useful under a certain level. This is especially true for investment subsidies. That is why this possibility was not taken into consideration above.

The Commission is critical about the total level of SA given in the EU. Therefore (40) assumes that when the benefits and costs of a SA decision/scheme are (approximately) equal the Commission would prohibit it. However this can be modeled in a more sophisticated way. The B (C) can be multiplied by a co-efficient $\alpha\sum_i s_i$ that measures the permission (prohibition) tendency of the Commission as a function of the total level of SA. This co-efficient can be modified to measure, for example, the subsidies given in a specific sector.

Finally one should admit that the drafters of Article 87 of the Treaty did not have in mind externalities. They were making a list of common political objectives that legitimized distortion of competition in their integrated market. Moreover, as stated in the third chapter, SA decisions reflect to a degree the policies pursued by the Commission or the EU as a whole. These phenomena can be captured by weighting B and/or C with a co-efficient reflecting the political importance attached to the issues or sectors that specific SA decisions/schemes affect. Such a co-efficient can also be utilized to build linkages between the SA decisions and the general political processes running in the context of the EU[193].

[192] The last such decision is Commission Decision of 22 September 2004 on restructuring aid implemented by France for Compagnie Marseille Réparation (CMR) — State aid C34/03 (ex N 728/02), (*OJ L* 100, 20.04.2005, p. 26) that asked France to recover 3 311 863 EUR out of a total amount of 3 490 000 EUR.

[193] Given the autonomy of the Commission in the execution of the SA policy especially the positions adopted by the members of the College of Commissioners would be important in such a model.

After reviewing some possible elaborations it is appropriate to take a look at the policy implications of the model. There are one direct and two indirect policy implications.

The direct policy implication is that the model shows that under positive externalities the Commission might prohibit some SA decisions/schemes that increase the total welfare of the EU; because it is not taking into consideration the impact of s_i on π_i. Instead of giving this inefficient decision the Commission can first ask A to compensate firm j. If the policy objective pursued by G is internalization of externalities instead of profit-shifting it would be ready to order firm i to compensate firm j fully (Remember that the firms are symmetric.). Firm i can also voluntarily limit its output; but this would have other competition policy implications. The practical value of this proposal is not necessarily correlated in a negative way with the number of enterprises in the relevant market since compensation schemes can be designed by the public authorities in order to overcome coordination failures.

The first indirect implication is related to the criticism made to Collie's first three articles, the criticism that production subsidies are operating aids that are usually prohibited and therefore investment and R&D subsidies are more relevant. The model shows that under positive externalities output subsidies can also be beneficial. Therefore the Commission should not prohibit output subsidies *per se* and see if there are any externalities internalized.

Indeed the Community itself (still) gives huge amounts of output subsidies under the CAP. However CAP is not really a good example because of the second indirect implication of the model, that is when there are large cross-border spill-overs or when externalities are generated symmetrically MSs would be more likely to design other Community policies or programmes that aim to cope with them. Otherwise (1) subsidies that are legitimate from the perspective of the MSs can be prohibited by the Commission under SA rules and (2) coordination failures between subsidization schemes might create undesired distortions. MSs would be less likely to design Community-wide measures when externalities are local or asymmetric. This policy implication demonstrates the relationship between the SA po-

licy and the other Community policies[194].

Lastly it should be stated that CAP might not even be considered as a good example for the second indirect policy implication; because agricultural production externalities faced by different MSs are certainly asymmetric. However for some MSs like France they are so important that the governments of these countries would just not give subsidies up; but these subsidies would hurt the producers in other MSs. Therefore they had to be compensated and so a general subsidization policy was designed instead of an asymmetric one like the regional policy. If the Community is able to run such a large compensation scheme it can surely design them for some of the SA cases. In other words the example of CAP best suits the direct policy implication.

4.2.6. Step Six: Political Economy

The thesis of the present study has been supported by the model developed in the first five steps. Further elaborations have also been articulated. In this final step an extension is made in order to discuss the implications of political economic considerations; but the entire model is not re-solved since the main point has already been made.

In the second section of chapter two, political economy was examined as a possible reason of government intervention in the markets and it was stated that the political economy of trade literature has been dominated by the Grossman-Helpman model ever since its publication (See pages 30 to 32.). Therefore the strategic trade policy model developed above is extended by a simplified Grossman-Helpman framework below[195].

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[194] A statement very similar to this policy implication is presented as a normative prescription in the context of international economics by a policy discussion paper:

> "when there are multiple countries, independent policy choices will be optimal only when the distortions being corrected are local and when the effects of the individual national policies on world prices are negligible. (...) However, when either the distortions themselves or the price effects of market intervention extend across borders, then independent policy choices will not be optimal."

See: Deardorff, Alan V. 2000. "The Economics of Government Market Intervention and Its International Dimension". Research Seminar in International Economics Discussion Paper No. 455. Ann Arbor, Michigan: University of Michigan. Available from the World Wide Web: <http://www.spp.umich.edu/rsie/workingpapers/wp.html>.

* * *

When governments have political economic considerations they are unlikely to be purely benevolent. In other words their objective functions are not likely to be identical to the domestic welfare functions of the countries they govern[196]. So what form do they take? According to the Grossman-Helpman framework governments are semi-benevolent. Therefore they maximize a weighted sum of domestic welfare and contributions given to them by special interest groups.

In the above model it was assumed that the profits of firm i are distributed among the laborers. Assume instead that χ of the P owns the firm. Further assume that they have overcome the collective action problem and organized without any costs[197]. This fraction of the population forms a special interest group.

In this setting any subsidy given to firm i is a transfer from the rest of the P to this group. If there are positive externalities associated with the production of firm i, these subsidies might still benefit the rest of the population. Otherwise they are faced with a loss.

If the decision on subsidization were made as in the model of Mayer, i.e. by majority voting among the population (See page 28.), then no subsidy would be given as long as $\chi < 0.5$.

Instead it is assumed that the decision is made by the government, G, that does not have any electoral concerns. G maximizes the following objective function

$$G = \beta W + (1 \ \beta)L \qquad (51)$$

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[195] Daron Acemoglu's application of the model to redistributive taxation in his lecture notes has been helpful in the simplification. See: Acemoglu, Daron. 2003. "Lecture Notes for Political Economy of Institutions and Development, 14.773". Available from the World Wide Web: <http://www.mit.edu>: pp. 47-54.

[196] These functions can still overlap if (1) the political regime is democratic, (2) the government only seeks re-election and (3) there is economic voting. However these conditions, especially (2) and (3), do not normally hold.

[197] For collective action probles see the classical treatment: Olson, Mancur C. 1965. *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge: Harvard University Press.

where L stands for lobbying contributions received by G and β, with $0 < \beta < 1$, is a parameter measuring the relative importance of domestic welfare and contributions for G. If β is zero G acts as a pure rent-seeker. If β is 1 it is a purely benevolent government as assumed in the previous sub-sections; but β is not defined for these values.

Special interest group χ offers the following binding contribution schedule L to G:

$$L = l_i s_i \tag{52}$$

where $0 < l_i < 1$.

Therefore the amount of the contribution G will get is linearly associated with the amount of subsidy χ will receive. In fact χ pays back some of the money it receives (A sideline assumption is that G cannot take direct transfers, i.e. steal from the society).

Since firm i receives subsidy per unit of investment this contribution function enters the profit function as $l_i s_i x_i$ and so the function becomes:

$$\pi_i = [a - b(q_i + q_j)]q_i - (c - \theta x_i)q_i - \frac{\sigma}{2}x_i^2 + s_i.x_i \;\; l_i s_i x_i$$

$$= [a - b(q_i + q_j)]q_i - (c - \theta x_i)q_i - \frac{\sigma}{2}x_i^2 + (1 \;\; l_i)s_i x_i \tag{53}$$

What is the impact of this political economic setting on subsidization and the SA policy? For simplicity assume throughout the analysis that firm j refuses to make investment (and therefore the government of B cannot subsidize even at $s_i = 1$.) as in step five.

Skipping the output stage of the game where nothing changes the optimal investment by firm i can be calculated by the following operations explained in the previous steps of the model:

$$\pi_i = bq_i^2 - \frac{\sigma}{2}x_i^2 + (1 - l_i)s_i x_i \tag{54}$$

$$\partial\pi_i/\partial x_i = 2bq_i(\partial q_{i/}\partial x_i) - \sigma x_i + (1\ \ l_i)s_i = 0 \tag{55}$$

$$x_i = \frac{4\theta a - 4\theta c + 9b(1-l_i)s_i}{9b\sigma - 8\theta^2} \tag{56}$$

Since there is no investment by firm j there is no system of investment functions to solve. The effect of s_i on x_i becomes:

$$\partial x_{i/}\partial s_i = \frac{9b(1-l_i)}{\Delta} \rangle 0 \tag{57}$$

Since $0 < l_i < 1$ the impact of one additional unit of subsidy on investment decreases. Profit and domestic welfare are given by composite functions including the investment function. Therefore the impacts of subsidy on profit and domestic welfare also decrease.

How about positive externalities? (50) above becomes:

$$\partial x_{i/}\partial s_i = \frac{27(1-l_i)}{3\Delta} \rangle 0 \tag{58}$$

The same amount of subsidy now internalizes a smaller amount of externality. Generalizing it can be stated that political economic considerations decrease the effectiveness of policy instruments.

In order to maximize domestic welfare the effectiveness of the total amount of subsidies should equal that of the subsidies given by (39); so the amount of subsidies distributed increases because of political economic considerations. This decreases the social benefit of profit-shifting.

Note that since q_i and q_j are strategic substitutes the externality of s_i on firm j has decreased as well. Since both of the elements entering the decision algorithm of the Commission decrease, political economic considerations do not have an impact on the content of the SA decision.

However the analysis is not complete yet; because the above equations only take into account the effect of the binding contribution schedule on the marginal impact of subsidies. They say nothing about the optimality of the total amount of subsidies distributed by G.

Let s^o be the optimal subsidy level for the benevolent government, without taking into consideration the actual amount of subsidies. What is the optimal amount of subsidy for the rent-seeking government?

The amount of contribution G gets (52) is a function of subsidies with the FOC:

$$L'(s_i) = l_i$$

Of course this does not give meaningful information; because the constraints of the maximization problem has not been taken into account.

G does not have unlimited financial resources that can be utilized to generate subsidies. The taxable income of the country equals its domestic welfare less any externalities, that is $P + \pi_i$. Since G wants to make a transfer from the rest of the society to the interest group it should limit the taxable income with $(1 \quad \chi)$. However in real life such a limitation is only observed when transfers are made from the rich to the poor and not vice versa. It is more realistic to assume that the taxable income is limited with P[198]. The maximization problem is:

$$\max_{s_i} \; l_i s_i, \; 0 \leq s_i \leq P$$

Since by definition $s_i > 0$, the value of s_i that solves the problem (s_i^*) should satisfy the following conditions: (1) $L'(s_i^*) \geq 0$ and (2) $(b \quad s_i^*) \; L'(s_i^*) = 0$. Therefore s_i^* is P, the entire taxable income of the society.

[198] Why so? Governments avoid serving certain special interests explicitly and have recourse to indirect and therefore inefficient (non-first-best) means. This phenomenon can be explained by the fact that information is costly to obtain and so tax payers cannot understand that indirect means are transfer from their pockets to those of the interest holders. Since the model presented here does not take into consideration elections it is not necessary to deal with this analytically.

Given the weighted objective function G, the level of subsidy set by the government is:

$G(s_i) = \beta s^o + (1 \ \beta)P$

Unless s^o is already P the amount of the subsidy distributed by the government in a political economic setting will be greater than the optimal strategic subsidy for any value of β.

Note that this result holds when there are positive externalities. The internalization of positive externalities beyond the optimal level is efficient. Therefore the value of the internalization (the benefit) relative to the losses of firm j (the cost) decreases. As a result the SA decision is more likely to be prohibited by the Commission.

This outcome is interesting; because it shows that even though the SA policy is designed to prohibit trade-distorting measures and thus the welfare losses of non-subsidizing MSs if there are political economic considerations it is also beneficial for the domestic welfare of the subsidizing MS.

* * *

Thus the modeling exercise comes to an end. In the first section of the second chapter three possible explanations were presented for government intervention in the markets: conventional reasons, intergovernmental competition and political economy. Strategic trade policy is a type of intergovernmental competition and externalities are among the conventional reasons. Therefore during the modeling exercise above, all of the possible reasons of government intervention were taken into consideration. It is shown that the SA policy certainly prohibits pure strategic trade policy, but it might allow subsidy measures when there are externalities. This possibility decreases when political economic considerations are at work.

5. CONCLUSIONS

The aim of the present study was explaining the function of the SA policy of the EU. This required a good deal of background information that was provided in the second chapter. The multidisciplinary third chapter examined the policy itself. Economic rationale, basic legal provisions and administrative issues were all covered briefly. Finally a policy analysis taking into consideration of the historical development of the policy was undertaken to present the hypothesis: The SA policy of the EU is designed to prevent Member States from giving subsidies that have distortive effects in the context of European economic integration unless they are otherwise acceptable.

The fourth chapter was the center of gravity of the present study. First the economic literature on SA policy was reviewed. Then a theoretical modeling exercise was undertaken to provide a contribution to the literature. The model built was a strategic trade policy model based on a Cournot duopoly operating in an integrated market. It was enriched with a simple decision algorithm representing the executive dimension of the SA policy and an original conception of negative and positive externalities. Therefore it was possible to show which SA decisions/schemes are prohibited by the Commission and which are permissed. Therefore the hypothesis was supported. Several elaborations were made and policy implications were discussed. An extension covering political economic considerations followed. A further interesting result was obtained: SA policy can be beneficial from a domestic welfare perspective when there are political economic dynamics.

The model developed in the fourth chapter is based on the most recent contributions to the literature on SA policy as well as the general strategic trade policy literature: Glowicka's study of February 2005 and Collie's working paper of July 2005. However these studies do not discuss non-reciprocal externalities and Commission's behavior. Therefore the present study's contribution to the literature is original. Moreover the dominant model of political economy of trade literature, namely Grossman-Helpman model, was used in the political economic extension.

Of course the model is not flawless or all encompassing. There are many issues left for further research. First of all, some of the more unrealistic simplifying assumptions should be lifted. The model should not be limited to a duopoly, third-market assumption and Cournot competition. Second, the interaction between MSs and the Commission should be modeled using game theory. Uncertainty, bargaining and non-notification are important characteristics of the decision-making process. Third, capture of the Commission by the opposing parties should be considered. Finally, and most interestingly, the question of the relationship between SAs and Community subsidies, that was mentioned in the fourth chapter as an indirect policy implication, should be analyzed formally. When do the MSs agree to give Community subsidies, when do they prefer SAs, legal and illegal, and when do they provide exemptions for SAs? CAP and regional policy would of course be the ideal case studies.

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