
4.3 Perverse Subsidies

by Norman Myers

Overview. *The question asked in this paper is: which subsidies are detrimental to society's overall and long-term interests? Subsidies represent 3.8% of a global economy of \$26 trillion and therefore play a prime role in the functioning of the global economy. They can be detrimental, i.e. 'perverse,' to society in the sense that they contribute to the destruction of the environment and the over-exploitation of natural resources. For example, agricultural subsidies can lead to over-loading of croplands and pollution from synthetic fertilisers and pesticides. The main problems associated with subsidies are that they are very expensive for governments and that they cause inefficiencies in production or the mis-use and over-use of resources. The case of subsidies for marine fisheries is studied in detail. All major marine fisheries are considered to be over-exploited and while world-wide harvest has increased almost fivefold since 1950, the catch has been declining since 1989. Subsidies, aimed at preserving the fishermen's jobs, aggravate the situation by allowing the fishing industry to continue over-exploiting the fisheries in spite of the declining annual catch. As a result, there is now an excessive extractive capacity in the fishing industry. Several policy responses are proposed, such as using the subsidies to retrain fishermen who are put out of work through reduced catches—whether reduced through declining stocks or through policy shifts. Another proposal is for governments to charge foreign fishermen for the right to catch off their shores. Finally, the solution proposed is that of a limited number of tradeable fishing rights to individual fishermen.*

4.3.1 Introduction

Perverse subsidies are those subsidies that exert adverse effects of both environmental and economic sorts over the long run. The principal subsidy sectors in question (only some of their subsidies can be viewed as "perverse") are agriculture, fossil fuels and nuclear energy, water, fisheries and forestry. It has been proposed (Panayotou, 1993¹) that total subsidies in these sectors amount to roughly \$1 trillion per year world-wide, or 3.8 percent of a global economy of \$26 trillion. This means that subsidies play a prime role in the functioning of the global economy. By the same token, if perverse subsidies amount to several hundred billion dollars per year, they exert a significantly distortive impact on the global economy.

At the same time, perverse subsidies are detrimental to environmental values. Subsidies for agriculture can foster over-loading of croplands, leading to erosion and compaction of topsoil, pollution from synthetic fertilisers and pesticides, denitrification of soils, and release of greenhouse gases, among other adverse effects. Subsidies for fossil fuels aggravate pollution effects such as acid rain, urban smog and global warming, while subsidies for nuclear energy serve to generate exceptionally toxic waste with

¹Dr. Panayotou was the first to identify perverse subsidies and to alert us to their importance.

an exceptionally long half-life. Subsidies for water encourage mis-use and over-use of water supplies that are increasingly scarce in many lands. Subsidies for fisheries foster over-harvesting of already depleted fish stocks. Subsidies for forestry encourage over-logging at a time when many forests have already been reduced whether through over-logging, acid rain or agricultural encroachment. Hence the environmental consequences of perverse subsidies can be pervasive and profound.

This is not to say that subsidies cannot serve many useful purposes. The key question here is: which subsidies, of what sorts, of what scope and with what impacts, can be viewed as "perverse", i.e. inimical to society's overall and long-term interests? Clearly this is a question of major import, yet it has scarcely been identified as a salient issue of our times, let alone documented and analysed.

This paper presents some preliminary findings of a short-term project undertaken by the writer, with the principal aim of establishing whether there is a significant problem of perverse subsidies, and if so, determining the nature and scale of the problem. A further aim is to develop a framework of analysis and evaluation for the generic issue of perverse subsidies. The project is no more than an exploratory exercise, with no claim to be definitive. To the extent that it demonstrates there is indeed a problem with significance for public policy, the writer hopes it will prompt further investigation of the issue.

Key question: "What are subsidies?" There are many sorts and conditions of subsidies, and they come in all shapes and sizes. Indeed they are a pervasive phenomenon of modern economies and hence a deep-seated factor of life both public and private. Not surprisingly, they have become a prime instrument of public policy. How do they arise? In what sectors? What do they cost? Whom do they principally benefit? Does anybody 'dis-benefit'? What is their impact on the economy at both macro and micro levels? Are there better ways to achieve the purposes intended by subsidies?²

Subsidies are regularly deployed to assist sectors of strategic importance, notably agriculture and defence, plus sectors which provide public or goods, notably education and health. The mode of operation generally aims to

²A subsidy can be defined as a form of government support, usually in the form of monetary payment, to a particular economic sector (institution, business, individual) with the aim of promoting an activity or set of activities that the government deems beneficial to the economy overall and to society at large. Indeed, this is one of the main roles that governments are created to perform: to encourage activities which, if left solely to markets, would occur in unfavourable quantities (Keppler, 1995; Koplrow, 1993; Michaelis, 1995; Pearce and Warford, 1993). A more formal and textbook definition (Putnam and Bartlett, 1993) states that "A subsidy is a transfer of economic resources by the government to the buyer or seller of a good or service that has the effect of reducing the price paid, increasing the price received, or reducing the cost of production of the good and service".

cover part or all of the costs of activities under-taken. Thus governments expend huge amounts to encourage e.g. universal education and to stabilise farmers' incomes (the reader will readily recognise lots of other examples). A long established and prominent example lies with governments' support for farmers, worth \$340 billion world-wide in 1992.

A subsidy amounts to any government expenditure that makes a resource such as energy or water appear cheaper to final consumers than its full economic cost. All such expenditures represent hidden costs of producing, converting and using a resource. They make energy, for instance, look cheaper than it really is by paying some of its real cost through taxes.

There is a structural drawback as well. Support for one activity causes countervailing effects for other activities as a built-in constraint. A subsidy is like a cake of limited size. If one person enjoys a larger slice, another person or persons have to make do with a smaller slice or slices. If everybody receives a subsidy, nobody does. This decrease in others' slices of the cake can be substantial – indeed, it is often greater than the increase in the slice of the party receiving the subsidy.

There is nothing new about subsidies. Their benefits were recognised by the Ancient Egyptians, followed by the Romans and Greeks. In virtually all societies, powerful groups have managed to obtain subsidies or "subsidies", i.e. whether overt or covert, whether agreed or imposed, as a result of having weaker groups shoulder some of the costs of their activities.³ Subsidies occur whenever anyone – an economic sector, a business or an individual – is able to do something for which someone else, willingly or unwillingly, picks up part of the cost. For example, whenever someone finds their local environment is polluted by smoke from a neighbour's bonfire (or undue noise from a barbecue party), they are effectively supplying a subsidy next door unless they receive compensation from next door for the stress caused.

4.3.2 Subsidies Broad and Narrow

³In addition to direct subsidies and taxes, government interventions can include price controls, import tariffs and quotas, support for research and development, infrastructure financing, and tax exemptions, among many other modes of supporting individual sectors. Some of these interventions, notably direct subsidies, tax exemptions and infrastructure financing, can be viewed as conventional subsidies whereby governments provide direct financial support for a given activity. Others, such as price controls, are effectively "cross-subsidies", whereby the customer is paying either more or less than the uncontrolled market price for a good, so that the transfer is between consumers and producers (for example, electricity market regulation). Then there are "covert" subsidies, which can include the failure of governments to internalize social and environmental costs, notably pollution costs, in the prices faced by suppliers and users of energy and transport services (Michaelis, 1995).

Subsidies can also be viewed in a broader and looser sense. For instance, the cost of an activity that is not entirely borne by the source of the activity, but by some other agent who may not directly benefit from the activity. Scandinavia may be said to be subsidising Britain's electricity generation by bearing the cost of acid rain which falls on Scandinavia as a result of British sulphur dioxide emissions.

So subsidies can be considered as broad or narrow in their operation and impact. Narrow subsidies include only monetary transfers by governments to institutions, businesses and individuals, while broad subsidies include transfers both monetary and non-monetary. The narrow form excludes many non-monetary transfers which to all intents and purposes are subsidies, whereas the broad form embraces transactions of whatever sort. The broad definition, referring simply to instances where the cost of an activity is not entirely borne by the source of the activity, may be confused with what is usually understood as an "externality"--a somewhat different matter. Broad subsidies are often difficult if not impossible to quantify. Nor is it always clear who or what is the cause of a broad subsidy. A narrow subsidy, e.g. a payment to farmers, is easily attributable to governments, and its intent is clear. Conversely a broad subsidy, e.g. the cost of vehicle emissions borne by the environment, is less easily attributable to a particular agent since many are involved. In any case, motorists do not intend that the environment should subsidize their driving. The subsidy is simply a function of how vehicles are manufactured and operated.

4.3.3 Pros and Cons

There has been a great expansion in subsidies this century, stemming in part from the two world wars and the Great Depression. These events have served to generate subsidies of new sorts and sometimes with multi-billion dollar budgets. Many of them serve beneficial purposes. Food subsidies in developing countries improve nutrition among the poor, they ensure markets for farmers, and they help foster socio-economic equality across income groups. Trouble arises when subsidies are retained long after they have exceeded their shelf life – by which time too they may have expanded way beyond what was originally envisaged. Regrettably, institutional inertia often prevents them from being reduced, let alone eliminated – and ditching them is often perceived to be a vote loser for governments, a good example being U.S. agriculture.

Note too that many subsidies generate knock-on or ripple effects. The energy sub-sector of oil generates annual sales of more than \$1 trillion,

and it forms the main component of the economies of several Middle East nations, plus large segments of the economies of Russia, Great Britain, Norway, Mexico, Venezuela, Indonesia and Nigeria. Subsidies for oil exploitation reverberate through associated sectors such as transportation and agriculture, also major banking interests.

Subsidies are so diverse that they can include the following: financing or below-market pricing of natural resources such as agricultural lands, water, timberlands and fossil fuels, plus the infrastructures thereof; commodity price programs; below-market supply of exploration rights for oil and minerals, together with tax preferences for extraction of these resources; and tax preferences for private-vehicle travel relative to other modes of transportation. Subsidies can also cover unpaid costs, notably environmental costs, that have not been internalised through government policies. Government costs of environmental protection can be regarded as a subsidy since these are costs that in a perfect market would be internal to market choices. There are further incentives in support of the environment. In the United States, these include: deductibility or direct tax credits for enhanced energy measures (non-polluting and renewable energy sources, energy efficiency and conservation); agricultural set-aside programs; funding of forest replanting; tax incentives for preserving open spaces; and government sharing of costs for biodiversity protection.

Many subsidies benefit more people than those directly involved. If these side benefits or externalities are not paid for, the subsidised activities may not take place at all, or only on a scale smaller than is socially desirable. For example, people who travel by bus or train benefit those who travel by car, because they leave the roads less congested and create less pollution than would be the case if everyone used cars. Unless the car users subsidise bus and train riders in order to pay for the clearer roads, fewer people will use buses and trains than is socially desirable. To this extent, subsidies make the free market work better. They should be anathema to neither politicians nor voters. But other subsidies make the market work less well, especially in the long run. Because the amount of whatever activity is being subsidised will likely increase, the result tends to be inefficiencies, waste, pollution and other ills whether economic and environmental, often both.

Despite their many positive features, subsidies often receive a bad press. For one thing, they have grown to be enormously expensive to governments. To repeat, they total \$1 trillion a year, or almost 4 percent of the global economy. Energy subsidies in China in 1989 were equivalent to fully seven percent of GNP. If governments were to reduce

their spending on subsidies, they would take a solid step toward better balancing of their budgets.

A second and still more significant problem with subsidies is that they encourage numerous inefficiencies in production. As concerns environmental resources in particular (farmlands, forests, fisheries, etc.), they often foster misuse and over-use of the resources, taking into account both their market and non-market values. They perpetuate the status quo in production processes by making it cheaper to continue with existing methods than to adopt costly new technologies. For instance, irrigation subsidies encourage farmers in developed and developing countries alike to keep on using inefficient but cheap flooding methods rather than adopting more expensive but more efficient trickle-drip techniques.

In sum, subsidies can promote greater economic efficiency and productivity, plus social equity, as is demonstrated by food subsidies in developing countries. At the same time, subsidies can become over-abundant, unnecessary and distortive. For an extreme instance, note that water subsidies in Saudi Arabia, of all countries, are so high that farmers can even afford to shower their cows to keep them cool!

Let us now take a lengthy look at an illustrative sector, marine fisheries.

4.3.4 Marine Fisheries in Decline

Marine fisheries world-wide produced a harvest in 1993 of 84 million tonnes, down from the peak of 86 million tonnes in 1989. The decline, which has continued through 1995, is regrettable not only from the conventional economic and environmental standpoints. Some 20 million fishermen and their families, as many as 100 million people, depend on ocean fishing for their livelihoods. Still more to the point, fish provides greater amounts of animal protein for human consumption than does meat; altogether it is the source of half the total protein consumed by humans. Of the 1993 catch of 84.3 million tonnes, 56 percent was taken by just eight nations. China accounted for 10.1 million (12.0 percent), Peru 8.2 million (9.7 percent), Japan 8.1 million (9.6 percent), Chile 6.1 million (7.2 percent), the United States 6.0 million (7.1 percent), Russia 4.5 million (5.3 percent), Spain 1.8 million (2.1 percent), and Canada 1.5 million (1.8 percent) (Food and Agriculture Organisation, 1995; see also Weber, 1994).

Since 1950 the world's fish catch has increased almost fivefold. But a steady forty-year growth appears to have topped out. If the catch were

measured by value instead of by weight, the decline would be even more marked: as the most valuable stocks are fished out, fishermen tend to hunt other, less valuable species. Almost all 200 marine fisheries are fully exploited if not heavily over-exploited, and some 80 of them are depleted to varying degrees [almost all in developed countries] (Food and Agriculture Organisation, 1994). All 27 major marine fisheries are considered to be over-exploited, and at least 20 of them are in serious decline or commercially extinct. In proportionate terms, 70 percent of fish stocks are "almost depleted" or "outright depleted", while the present catch is estimated to be 20 percent above what would be sustainable (Food and Agriculture Organisation, 1995; see also Van Dyke *et al.*, 1994; Weber, 1993). Indeed, nine of the world's 17 major fishing grounds are in precipitous decline, and four are commercially "fished out".

By way of illustration, the Northwest Atlantic catch has fallen by almost one third during the past twenty years. Such is the decline of cod stocks in the once-bountiful fishery of Newfoundland's Grand Bank that in 1992 the fishing grounds were closed indefinitely. In Europe's North Sea, stocks of cod and haddock fell by 83 percent during 1971-1990 and the stock of mackerel crashed 50-fold during 1960-1991, while the herring fishery, closed altogether in 1977-82, has not recovered to anywhere near its former levels. Catches in the Gulf of Thailand have been maintained only because an expanding trawler fleet has been fishing the stocks ever-more intensively, a situation that plainly cannot persist indefinitely (Food and Agriculture Organisation, 1994).

4.3.5 Reasons for the Decline

The critical issue here is the "tragedy of the commons", plus the related problem of debarbs to collective action. These problems probably do not have a more graphic, widespread or intractable manifestation than through fishing (Cairncross, 1995). For much of fishing's history there have been enough fish in the world's oceans and there have been sufficiently few fishing enterprises for each nation to take its catch without depleting the total stock. The built-in inducement to take slightly more than one's share has proven too potent, however, since the benefit has accrued exclusively to the over-fishing nation while the cost has been borne by all fishing nations. Once a single nation has begun over-fishing, others have followed suit. The upshot is today's deeply depleted stocks. In addition to the problem of a common property resource vulnerable to "open access" or free-for-all exploitation, there is a problem with the market rate of discount, which has generally been high

enough to further encourage fishermen to view the fisheries within a foreshortened time horizon and to over-exploit the resource.

4.3.6 The Role of Subsidies

One might suppose that the fisheries decline would send a clear message to governments that they should reduce their excessive fishing. But on the contrary, they tend to put off the day of reckoning by stepping up their subsidies to the fishing industry. Once fishermen's livelihoods are in danger, governments provide plentiful incentives for them to catch more rather than fewer fish – thus exacerbating the problem from top to bottom. The solution is a severe reduction if not eventual phasing out of subsidies, paralleled by a collective decision to protect remaining fish stocks through collective action, properly enforced.

Meantime, governments have been inclined to engage in ever-heavier subsidies. State supports help to pay for more and larger boats, longer nets and more sophisticated equipment all round, even extending to radar and remote-sensing devices. Given the advanced technology of the 1990s fishing industry, just one fifth of the world's fishing fleet could catch the maximum sustainable yield of fish.

The 1993 catch was worth \$56 billion in the marketplace. Yet the fishing effort to land the catch – boats with their crews, equipment, etc. – cost \$110 billion. The difference between that figure and the marketplace price of the catch, viz. \$54 billion, was almost entirely made up of government subsidies including price controls, fuel-tax exemptions, low-interest loans, and outright grants for gear and other infrastructure. These subsidies arise from the efforts of governments to preserve their fishermen's jobs. Regrettably these incentives have long induced investors to finance more industrial fishing ships than the fish stocks could possibly sustain. During 1970-1990, the world's fishing fleet grew at twice the rate of the global catch, doubling in both ships' numbers and their tonnage. This armada finally achieved twice the capitalised capacity needed to extract what the oceans could sustainably produce, being an amount at least 20 percent less than today's harvest.

Because this excessive capacity has rapidly depleted the amount of fish available, profitability has generally plunged, reducing the value of ships on the market. Unable to sell their chief assets without major financial loss, owners of the vessels have found themselves forced to keep on fishing, or rather over-fishing, in order to repay their loans. They are caught in an economic trap. In response, they have mobilized political

pressure on governments to refrain from cutting fishing quotas (Food and Agriculture Organization, 1994; Safina, 1995).

The costs to fisheries are substantial. If, in the case of the United States, the principal fish species in question were allowed to rebuild to their long-term potential, sustainable harvesting would add \$8 billion to U.S. GDP and provide some 300,000 jobs. Within U.S. federal waters, today's catch is only half as valuable as it could be if fish stocks were allowed to recover. The worldwide loss through fisheries decline is reckoned to be \$15-30 billion per year. If fish populations were restored and properly managed, at least 20 million tonnes, or roughly one quarter of the 1994 catch, could be added to the annual harvest (Food and Agriculture Organization, 1994).

Additionally, subsidies encourage gross wastage within the fishing industry. Fishermen make enough profit on their subsidised operations, albeit at the cost of progressively depleted fisheries, that they throw away many fish that could be marketed but do not command best prices. World-wide discards total at least 27 million tonnes per year, equivalent to one third of all fish harvests. Discards of king crab in the Bering Sea in 1990 amounted to 16 million individuals, more than five times the number landed, and weighing 340,000 tonnes. Off the northern coast of Norway in the 1986-87 season, as many as 80 million cod, weighing almost 100,000 tonnes, were discarded because they were too small. Also in 1986-87, two million tonnes of fin fish were dumped overboard in the Gulf of Mexico. In Europe's North Sea, about half of the haddock and whiting caught for human consumption each year is discarded, usually because the fish are too small or of inferior quality. In some shrimp fisheries, up to 15 tonnes of fish are dumped for every one tonne of shrimp landed. Most of the by-catch is thrown back either dying, dead, or in such a weakened state that it forms easy prey for predators (Alverson *et al.*, 1994).

4.3.7 Policy Responses

While the \$54 billion figure is small as compared with perverse subsidies for agriculture and fossil fuels, the fisheries sector is nonetheless the most politically volatile of all sectors reviewed. This is evident from the numerous fishing disputes over the past several years and especially the last eighteen months. Fortunately there are signs of some improvement in the situation. Iceland has recently cut back its domestic fishing by 50 percent. The European Union is planning to decommission 40 percent of its fishing vessel capacity, whereupon its fisheries could, if allowed to rebuild, eventually yield a further \$2.5

billion worth of fish a year. At present the E.U. spends nearly \$600 million a year on fishing subsidies, almost all of it to expand the already bloated fishing fleets. Why not use the \$600 million to retrain fishermen who are put out of work through reduced catches – whether reduced through declining stocks or through policy shifts?

Similarly the Canadian government is spending more than C\$1 billion to supply other employment for its 35,000 fish workers laid off through a government effort to restore depleted fish stocks. If governments feel politically obliged to make payments to their fishermen, they would do far better to create incentives such as retraining for alternative employment, rather than fostering ever-greater capacity to chase ever-fewer fish (Cairncross, 1995; Weber, 1994).

There are still further policy initiatives open to governments. Only ten percent or so of the world's catch is found in international waters, the rest being within 200 nautical miles of some nation's shoreline. Yet governments hardly ever charge fishermen for the right to catch off their shores. The few governments that impose such charges set the price way too low, typically no more than five percent of the catch's value. If governments were to charge fishermen an appropriate price for access to their fisheries (and if they were also to manage their fisheries as communal rather than commons resources), the results would be formidable. For instance, the Falkland Islands' fisheries are exploited mostly by foreign fleets. When the Islands introduced charges of up to 28 percent of the catch's value, the result was vigorous protest from the foreign fishermen. But the increased fees yielded revenues enough to quadruple the Islands' GDP – and they supplied a stream of revenues that could be used to pay for still better management and policing of the fisheries.

A final policy response could lie with the issue of a limited number of tradable fishing rights to individual fishermen. Not only would this help to curb over-fishing and boost fishermen's incomes. It would mean that those persons obliged to leave the industry would receive implicit compensation by being able to sell their rights to those who remain. This approach has been tried with some success in Australia and New Zealand.

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