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Industrial Subsidies

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Summary and Conclusion

Though there is no clear-cut definition of a subsidy, in theory, for instance under welfare economics, they are suggested to achieve a Pareto-efficient allocation of resources in line with the Second -Best Theory, and in practice they are widely used by the governments to correct market failures and encourage new investments all over the world.

In this study, justifications for industrial subsidies are first mentioned, and then effects of them as budgetary and other effects widely seen especially in developed countries are examined. Finally, capital subsidies in the form of various capital incentives i.e. investment allowances, tax deductions and rebates, accelerated depreciation are discussed as macro and micro economic effects on the economy and firms, respectively.

It is suggested, however, that further elaborations are needed, perhaps through cost / benefit analysis, since the effectiveness of industrial subsidies is obscure, at best mixed.

I. Justifications for Subsidies

As Prest puts it "the definition of a subsidy is not free from difficulties" (Prest, 1974: 1). He then provides us with the least unsatisfactory definition of government subsidies as follows:

"Subsidies are out-payments by central governments which carry political responsibility in order to induce changes in relative prices in the private sector, including foreign trade by means of offering incentives (rewards) rather than imposing penalties so that private sector action will either reallocate resources to increase aggregate value of output or export in an already fully employed economy, or redistribute income or both" (Prest, 1975: 2).

Industrial subsidies can be justified on economic, social and political grounds as follows.

First, as led by market forces, industrial adjustment may generate certain disequilibria in economic and social structures that no government can overlook. The process of reallocation of production factors may bring about social costs which

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can largely exceed the the private costs incurred, notably with regard to sunk or depreciated capital and to displaced labour. Costs and benefits of industrial adjustment may be inequitably shared among sectors, regions and firms. In effect, becouse they suffer from objective disadvantages, such as a lack of infrastructure in the case of regions, or the higher cost of financing or gaining access to technology in the case of small and medium-sized enterprises, their growth potential may be jeopardised in the absence of government policies aimed at reduced or alleviating disparities.

Second, the arguments for industrial subsidies are usually based on the need to increase employment (or to reduce unemployment) and to correct balance-of-payments disequilibria, caused by decreases in export revenues due to strong competition coming from other countries,especially NICs (Newly Industrialised Countries like South Korea and Argentina).

Third, market imperfections such as externalities, particularly those flowing from R & D activities and innovation expenditures; increasing returns to scale and informational asymmetries have most often been invoked to justify the second-best use of subsidization. Moreover, the economics literature justifies public intervention when the social rate of discount is lower than the private one. Rational allocative investment decisions taken on the basis of short-term market signals may prove inefficient in a longer-term perspective. (Mayshor, 1977: 20-28).

Last but not least, it has been argued that governments should ensure that domestic ındustries operate under conditions or costs equivalent to those enjoyed by their foreign competitors. This is particularly important when domestic firms are competing with foreign government subsidies not directly with foreign firms themselves.

II. Effects of Industrial Subsidies

Having revised the rationale for industrial subsidies, we can then deal with the effect of industrial subsidies. But finding a useful and relative basis for differentiating among subsidies and other support measures, to highlight their economic effects, is very dificult becouse various criteria can be applied. Furthermore no classification is entirely satisfactory for assessing the economic effects of subsidies.To be more precise, general meaures which in principle do not discriminate amongst sectors can have de-facto differential consequences for sectors or even firms. On the other hand, sectoral measures can have macro economic effects. The economic effect of measures implemented in a given policy area strongly depends on the types of instruments (financial or otherwise) which are used. On the other hand, the same financial instrument may be efficient in one policy area and not in another.

In addition, the impact of subsidies can, and does, vary from industry to industry. For instance, what holds good for computers, automobiles, petrochemicals and food may not hold good for crude oil production, copper mining or banking. Therefore, generalizations about the effects of subsidies are always fraught with danger.

A. Budgetary Effects of Industrial Subsidies

Nevertheless, we are more or less certain about the budgetary effects of subsidies, the overall amount of money spent on subsidies is an indication of the gross amount of tax revenue that must be raised accordingly, or, alternatively, it is an indication of the scale of other government praogrammes that can not be funded at existing taxation levels.

In this sense, the cost of raising extra revenue is substantial. According to a survey (Hazemann, Jones, Montador, 1988: 185-286), the estimated marginal welfare cost of raising an extra Dollar of revenue in the US ranges from USD 1.15 to USD 1.50 That is to say, if this Dollar is used as a subsidy, the rate of return- the increment to net social welfare arising from the subsidy- must be at least 15 % and perhaps as high as 50 %, just to pay for the the excess cost of raising the funds. This figure is even higher in Europe,for example it is USD 7.20 for each Dollar raised in Europe (Hazemann, Jones, Montador, 1988). Other measures are the ratio of subsidy expenditure to total public expenditure or of subsidy expenditure to budget deficit as indicated in the Table .

It is illuminating to see the volume of the aid in relation to the budget deficit in EC Countries. In all member states, subsidies are a significant proportion of this deficit and in Germany they actually exceed it (139 %), in France and the UK, aid is equal to the deficit.

Taking into consideration the subsidy element of different forms of aid as a precentage of total subsidies in manufacturing, it can be stated that the burden of subsidies in the form of cash grants and foregone tax revenues- tax reductions and deferrals on the general budget is tremendous. For example in Belgium, this ratio is 72 %, Denmark 70 %, Germany 93 %, Greece 88 %, Spain 78 %,France 49 %,İreland 89 %, Italy 90 %, Luxembourg 77 %, Netherlands 94 %, Portugal 86 % and the UK 75 %. (Hazemann, Jones, Montador,1988).

B. Other Effects of Industrial Subsidies

One of the reasons for providing industry with subsidies is to support new industries. In fact, there is no shortage of recent examples of subsidies designed specifically for the development of new industries. For instance, the Airbus Industry is estimated to have absorbed some USD 12 Billion in unpaid loans and guarantees, although official figures are unavailable. The Joint European Submicron Silicon (JESSI) project is designed to promote to manufacture of semiconductor chips, and about half its funding is to come from the European Governments or, indirectly,

through the EC. The SEMATECH Consortium in the USA which is to promote research into semiconductors, is a joint private/public venture with an annual budget of USD 225 Million, of which USD 100 Million is to come from the Federal Government through defence funds(Ford,Suyker, 1990: 19).

Are the results of these supportive programmes all successful? Several systematic studies have been undertaken to assess the results of government intervention by means of subsidies based on the assumed existence of economic rents due to returns to scale. For example, Baldwin and Krugman (Baldwin, Krugman, 1987) studied first the costs and benefits of the subsidies provided by European governments to 16 K random-access memory chips and to the airbus Consortium.

More recently, Klepper (Klepper, 1987) carried out an analysis of the Boeing-Airbus competition and included small and longe-range commercial aircraft as well as the medium-range aircraft analysed by Baldwin and Krugman. The evidence from these three studies suggests that subsidization can indeed promote entry into markets characterised by large returns to scale, but that the costs tend to outweigh the benefits, even when these are calculated on narrowly nationalistic basis.

Table: BUDGETARY IMPACTS OF SUBSIDIES (Average 1986 - 1988)

	Subsidy as of % Of Budget Deficit	**Budget Deficit as % GDP**	**Subsidy as of % Public Expenditure**
Belgium	43	7	6
Denmark	Budget Surplus	--	2
Germany	139	2	5
Greece	23	13	6
Spain	54	4	6
France	98	2	4
Ireland	34	8	5
Italy	28	11	6
Luxembourg	Budget Surplus	--	8
The Netherlands	22	6	2
Portugal	33	7	5
United Kingdom	100	1	3

Source: EC, Second Survey on State Aids in The European Community in The Manufacturing and Certain Other Sectors, Luxembourg, 1990, p.24

With regard to the support for declining industries, it is difficult to assess the effectiveness of such support becouse of the absence of specific measures of the costs, and of stated goals in terms of their reduction. However, as an OECD survey points out (OECD, 1977) it has not been successful in preventing large employment

losses in industries facing long term adjustment problems nor in restoring their competitiveness. It seems more likely that subsidies have hampered necesarry structural adjustment by retaining resources in the declining industries through supporting uncompetitively high wage and profit rates.

A further main economic objective has been support R&D activities and innovations, since government R&D subsidies construct a substantial part of total R&D expenditures in private sector. For example, in OECD as a whole 23.7 % of total R&D expenditures is met by government -financed expenditure schemes,namely government subsidies.This figure is almost 34 % in the USA, 24 % in France and 23 % in the UK(OECD, 1977).

In theory, clearly, an increase in the application of potentially useful knowledge to production through innovation should lead to upward shifts in the frontier production function and enhance economic growth. In otherwards, R & D activities should be one of the crucial factors that govern the upward shift of the frontier production, the fundamental determinant of output at full efficiency (Arrow, 1986).

In practice, however, several studies conducted suggest that the terms of efficiency are,at best, mixed.

Many sudies, based mainly in the US, Canada and France have shown that R & D carried out in the private sector has significant private returns, that the social returns exceed the private returns, often by a factor or two or more, and that spillovers, or externalities,exist between firms in the same industry and across industries(Ford, Suyker, 1990: 23). In other words, the results of these studies imply that governmenr subsidization of R&D, either directly through public establishments or research institutions or through R & D grants and R & D contracts, and tax concessions has potentially large social returns.

However, as pointed out in the OECD Study on Structural Adjustment and Economic Performance: "The results have sometimes been dissapointing. Alongside France's undeniable successes which include the nuclear and telecommunication industries, there have been major set-backs. Moreover, these strategies have had and adverse impact on technological adjustment in other sectors of industry. Policy makers, given insufficient attention to the diffusion of technology and the channeling of financial and human resources into very large scale pragrammes has infact inhibited the spread of technology." (OECD, 1977)

Further complications may arise with R & D support in the form of tax concessions. Experience in recent years has highlighted some possible shortcomings. Various studies pointed out that the actual multiplier effect on R & D investment may not be as high as expected. For one public Dollar of lost fiscal revenue, there may be only one Dollar of increased R & D investment and, in some cases, the multiplier rate may even be less than one. Moreover, such schemes do not benefit start-up enterprises which have to incur high

R & D expenditures in their first developing years without substantial profits (Malkin, 1990: 32-64).

Regional development subsidies in this sense however are also very important. In fact, they are aimed at creating employment, redistributing income and creating equity across regions. In theory, subsidies can attract enterprises to underdeveloped or poor regions and so, it is hoped to encourage economic growth.

However, the success of a regional policy is difficult to judge, becouse on one hand poor regions tend to remain poor despite large development aids, whilst on the other hand there is also direct evidence to suggest that subsidy policy can improve regional economic welfare.

Evaluating the effectiveness of regional subsidies hinges on estimating what would have happened if government support had been absent. An example is the analysis of tariff protection using ORANI -General Equilibrium Model of Australian economy. (Dixon, Parmanter, Sutton, Vincent, 1982)ORANI has regional detail based on the regional distribution of sectoral activity and intra regional multliers. The study concludes that all the benefit went to one State (Victoria), while there are other states to bore the costs imposed by the tariff. As it is possible to replace the the tariff system with an equivalent tax subsidy scheme, these results suggest that income can be transferred between regions through subsidization of industries. However they provide no information about the costs and benefits of policies directed specifically at poor regions.

Concerning export subsidies, it has been estimated that, in recent years, for OECD Countries as a whole, about 40 % of the total amount of capital goods exports have benefited from export subsidies in the form of export credits or public guarantees.

Although export subsidies can serve several policy goals such as raising aggregate demand and thus reducing unemployment through output and income effect, mitigating the adverse effects of anti-inflationary policies on employment and trade, allowing domestic firms to capture rents from foreigners in the presence of economies of scale and functioning as retaliation against foreign export subsidies, in the hope of forcing a " level playing field", it can be argued that the costs of subsidization remain high. Furthermore, the macro-economic effects of export subsidies remain dubious and they entail resource allocation distortions

At this context, South Korean Model is a good example. In terms of the cost of capital effects, the export sector has enjoyed very large benefits from the export promotion scheme which consists mainly of fiscal incentives (tax concessions) and financial incentives. A study carried out by the Korean Development Institute (KDI) indicates (Kwach, 1988), however that the efficacy of this comprehensive export subsidy scheme is dubious. It was found out that, in spite of the seemingly generous tax incentives, they have played at most a minor role in export promotion. In fact, in

the 1960s, the early years of the export-led development strategy, tax incentives actually had a negative net effect on export subsidies, and among the the tax incentives the 50 % tax exemption rule was responsible for this phenomenon. On the other hand, financial incentives, such as export credits and guarantees assumed to be the major burden of export promotion but this contribution of financial incentives were eroded by fiscal incentives during the period of 1960 - 1986.

Similar results were obtained by a study carried out by the Under-Secretariat for Treasury and Foreign Trade of the Turkish Prime Ministry in 1988 (T.C.Başbakanlık, Hazine ve Dış Ticaret Müsteşarlığı, 1988). In this study, the relationship between exports and fiscal and financial incentives such as tax rebates, cash grants from the Support and Price Stability Fund (DFIF) and export credits and flexible foreign exchange rate policies applied during the period of 1984- 1987 was studied. Findings show that tax rebates and cash grants from DFIF were not effective in increasing exports during the period while export credits and exchange rate policies helped increase exports. Moreover, tax rebates and DFIF grants (premiums) had adverse effects on resource allocation and income distribution by giving rise to fictitious export activities accompanied by fraud, serious abuse and misuse rather than real export sales during the period (that explains the reason why the export rebate system introduced in Turkey first in 1975 to counter the adverse effects of indirect taxes and duties thet exporters of manufactured goods were to borne was abolished in 1990).

III. Capital Subsidies

Capital subsidies can take many different forms of investment allowances such as deductions and rebates, accelerated depreciation, cash grants, soft loans, guarantees, interest subsidies and so forth. They are all aimed at promoting investment through increasing the profibilitiy of investment. While much theoritical and empirical researches have been devoted to assessing their effectiveness, the debate continues as to what, if anything,they can really achieve.

Let us then see their macro-economic and allocative effects (rather adverse) and micro-economic effects (controvertial).

A. Macro Economic and Allocative Effects of Capital Subsidies:

Firstly, to the extent that investment support schemes are effective, they give rise to an increase in the demand for capital goods. Such an increase may have a significant effect on trade balance for countries with a high import elasticity with respect to demand for capital goods. In addition, productivity of capital at the margin decreases as investment (capital input) rises relative to labour input. Consequently on the budget side, the cost of subsidy must be financed by some means such as reducing expenditure elsewhere, thereby changing the prices of those factors and

therefore costs of production in other sectors of the economy, raising taxes, borrowing or monetary creation. Each of these surely imposes costs on the economy.

These costs, however could potentially be offset by expected improvements regarding investment, output and employment. But emprical studies tend to support the view that whilst capital subsidies may effect the investment behaviour of firms positively, but the multiplier effect does not always justify the costs. Moreover, if an investment incentive is temprorary (which it should be), it affects the timing of expenditures without a lasting effect on the level of capital stock (Brannon, 1972: 246).

Furthermore government financing of capital subsidies through increased borrowing may also lead to crowding out effects. Depending upon the indebtedness ratio of enterprises, potential benefits may therefore be reduced becouse of higher interest rates.

Of course, when subsidies are financed through expansion of the money supply, they feel inflationary pressures in the economy, leading eventually to restrictive monetary policies.

Secondly, capital subsidies can have other allocative effects.They implicitly discriminate between sectors and therefore introduce distortive biases in the intersectoral allocation of resources due to intersectoral differences in capital / output ratios. Furthermore, as intangible investment (usually excluded from the scope of investment subsidies) becomes increasingly important for improving firms' productivity and competitiveness, these biases are emphasised.

Nevertheless, capital subsidies may be justified when they help reduce allocative distortions that are rooted in the imperfections of capital markets. The level and distribution of funds available for investment may in effect be distorted by government regulation of capital markets or the practices of financial institutions. The credit gap suffered in many countries by small and medium-sized enterprises (SMEs) is typical of this situation. However, becouse the differences in the price of capital have an economic rationale, it is certainly not desirable to aim at eliminating them primarily through subsidization(OECD, 1989).

In their macro effects, capital subsidies are critised on the ground that they redistribute the national income in favour of the capital owners, that is, the rich, at the expense of the labour force and the poor. In fact it is not difficult to see that a capital subsidy is an action of transferring public money, funded mainly through public taxes etc, to specific interest groups, such as investors. This will of course, give rise to a redistribution of income in favour of the recipient. In other cases,such as support for declining industries and employment creation, the expilicit aim seems to be supporting the labour force encountering unemployment, income losses etc. However, the success of the subsidies as such really depends on the incidence of the subsidy. In some cases, the ultimate redistributive effect can be to follow the owners

of capital to reimburse some of their losses, although the subsidy may have been intended to case the adjustment for workers.

Capital subsidies also have effects on international trade and international capital movement through invoking retaliation and emulation, and changing the external position causing deterioation in the balance of payments.

B. Micro-Economic Effects of Capital Subsidies

These effects are quite controvertial. In theory, at the level of the firm, these subsidies may increase investment through income and substitution effects and affect the choice of location through additional profitibility possibilities offered by the incentives. By raising the rate of return to capital of those projects which would otherwise remain below the margin of profibility, the firm is pushed into a higher production function which usually embodies a more capital intensive technology. Depending on how much of the savings are passed on to consumers, the reduction of the avarage cost of production can lead to an expansion of output. A substitution effect may be added to this through capital deepening where the ratio of capital to labour and other inputs tends to increase, depending on the technical opportunities for substitution. That is to say, capital deepening or,more generally, a rapid renewal of capital equipment allowed by the reduction of capital costs can accelerate the modernisation of production processes, raise the technological level of firms and increase competitiveness.

In practice, however, results are at best mixed. There have been plentiful surveys and econometric studies, assessing the effectiveness of investment incentives on profitibility and choice of location. Some of them are quite dated though, there is no reason to believe that their results are not still valid today.

To begin with, among the studies favouring the use of investment incentives, an early example is by Hall and Jorgenson. They used a neo-classical framework to investigate the effects of series of changes in the US tax credit and depreciation rules made during 1954 to 1967. Their conclusion is " that tax policy has been highly effective in changing the level and the timing of investment expenditures. The adoption of accelerated methods for depreciation and the reduction in depreciation lifetimes for tax purposes increased investment expenditure substantially. They also resulted in a shift in the composition of investment away from equipment toward structures limited to equipment, the investment tax credit has been a potent stimulus to the level of investment....."(Hall, Jorgenson, 1974: 11)

Eleven econometric studies carried out in the UK between 1967 and 1974 also produced similar results, non of which supported allegations that incentives have been wholly in effective. But it is difficult to derive much further insight (Lurd, 1975: 245-263).

E. Bond, in his work concludes that tax holidays applied in Puerto Rico since 1949 resulted in a rapid turnover of firms with newly exempt firms driving out firms whose exemptions had expired. He also concluded that this has important policy implications for countries using tax holidays as a means of encouraging investment(Bond, 1981).

Later on, a survey covering 74 investment decisions made by multinational corporations was carried out by Guisinger(Guisinger, 1985: 38-42). Guisinger and his associates studied 74 investment decisions in four industries,namely automobiles, petrochemicals, food products and computers. 10 countries were studied, including 7 developing countries. While several variables were recognised as influencing or determining an investment decision, the approach taken was to hold all others constant and seek to study the influence of just one, investment incentives. Guisinger and his associates asked the relevant staff of the multinationals the following question: " If no incentives had been offered by the host country where you located your plant, would you have been more or less likely to have located your plant in this country?" The results of the study suggested that some two -thirds (50) of the total investment decisions were taken to located in a particular host country becouse of the presence of incentives. The overall conclusion is that incentives do affect the location of investments.

On the other hand, there have also been studies claiming that investnet incentives are not effective in the choice of location decisions, or at least the effects are negligible. For instance a survey (Galenson, 1984) was carried out in 1961, comprising 205 companies covering 305 investments made in 67 countries around the world and of 20 governments. The differences between governments and investors as to which factors are believed to be important is striking. The governments rated the five most important incentives offered to foreign investors as tax relief, equality of treatment with domestic enterprises, a progressive domestic climate, favourable terms for transfer of profit etc. By contrast, while aggreing that quality of treatment and transfer of profits and repatriation of capital were important, investors considered the other three important government policies to be establihment of and firm adherence to a national development program, non-discrimination against foreign ownership and control and freedom from detailed or burdensome regulations on organisation, ownership and management. They did not consider fiscal or financial investment incentives to be important factors for choice of location.

In another survey of 247 North American Corporations with foreign investment, 57 % listed currency inconvertibility as a factor discouraging investment, 39 % mentioned instability of the host country, 38 % national discrimination and 26 % a limited market of source of supply. Only 10 % expressed any interest in favourable foreign taxes as a condition of investment (Lent, 1967: 305-310).

In a small survey in Mexico, Ross and Christensen asked 24 firms wherher they would have started business without the availability of the tax exemption ; 14 answered Yes, 9 probably Yes, and only 1 probably No. Investors interviewed stressed the importance of the government's general attitute towards private investment. Tariff policy was universally mentioned as the most important government policy (Galenson, 1984: 38).

After reviewing the evidence, Lent concludes that: " in general, developing countries need to be concerned about matching the tax benefits of other countries in order to attract foreign capital for new industries. Tax considerations typically play a role subordinate to more basic economic factors in the location of industry. Competitive bidding among countries by the offer of more and more generous tax concessions tends to reduce revenues from foreign investment without increasing the total flow of capital, while tax incentives are relatively more important for export industries which do not benefit from protection, the primary factors determining industrial location are the opportunities for profits based on comparative costs (such as those for labour, transportation, and power), availability of raw materials and size of markets, as well as the political and economic risks. The costs could effect the location decision if all the other factors were comparable among the alternative countries "

(Lent, 1967).

Finally, after studying the practice of industrial subsidies in four European Countries (Hungary, The Netherlands, Sweden and Germany), Appels (Appels, 1986: 314 - 348) concludes that there are likely to be negative effects in terms of efficiency when the mechanism of the political process are introduced in the supply side of the free market through policy measures such as industrial subsidies. Problems associated with this kind of implementation can be summarised in three points.

- Governments can not be expected to be sufficiently informed about all the specific cases. They lack information since they are not familiar with the particular field.
- Governments are subject to strong political pressures to grant subsidies to weak firms. They are pushed in the wrong direction from an efficiency point of view.
- The system of subsidies as such entails harmful economic consequences. Governments do not face a budget constraint as hard as that of a firm in the free market. They are less forced to take the right decisions. In addition, the spirit of enterprises is weakened in the sense that factors related to business efficiency become less important.
- Uncertainty for firms increases.

As a final remark and one definite conclusion can be drawn that the effectiveness of industrial subsidies is obscure at best, mixed. Further elaborations on the subject are needed, perhaps through cost/benefit analysis, if applicable.

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