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the Mezzogiorno:
a Principal-Agent Analysis**
Massimo Florio – Irene Valsecchi

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Dipartimento di Economia Politica e Aziendale
Università degli Studi di Milano

via Conservatorio, 7
20122 Milano
tel. 0039/02/76074501
fax 0039/02/76009695

E Mail: dipeco@imiucca.csi.unimi.it

PLANNING AGREEMENTS IN THE MEZZOGIORNO: A PRINCIPAL-AGENT ANALYSIS

Massimo Florio*

Irene Valsecchi**

Dipartimento di Economia
Università degli Studi di Milano
Via Conservatorio, 7
20122 Milano

Abstract

In this paper we analyse the so-called "planning contracts" which are adopted for the Italian Mezzogiorno from the point of view of the theory of incentives. The Italian Government is the principal who wants to promote economic development in Southern regions of the country. Large firms, both Italian or foreign, are the agents who are keen on locating new plants or restructuring existing ones, provided that expected profits are sufficiently high. Incentives are necessary in order to smooth out any extra-costs encountered when investing and operating in a less favourable environment.

We suggest that planning contracts can be interpreted as a case of procurement where Government is the sole buyer of a public good. We refer to a model by Laffont and Tirole (1993) in order to show that under conditions which may be relevant for the Italian experience, firms will enjoy rents that imply allocative inefficiency because of an excess of investment.

* Tel. +39 02 76074523, Fax +39 02 76009695, e-mail: florio@imiucca.csi.unimi.it

** Tel. +39 02 76074511, Fax +39 02 76009695, e-mail: valseire@imiucca.csi.unimi.it

Introduction

In this paper we analyse the so-called "planning contracts" which are adopted for the Italian Mezzogiorno from the point of view of the theory of incentives. The Italian Government is the principal who wants to promote economic development in Southern regions of the country. Large firms, both Italian or foreign, are the agents who are keen on locating new plants or restructuring existing ones, provided that expected profits are sufficiently high. Incentives are necessary in order to smooth out any extra-costs encountered when investing and operating in a less favourable environment.

We suggest that planning contracts can be interpreted as a case of procurement where Government is the sole buyer of a public good. We refer to a model by Laffont and Tirole (1993) in order to show that under conditions which may be relevant for the Italian experience, firms will enjoy rents that imply allocative inefficiency because of an excess of investment.

The paper is organised in four sections. First, some background information on planning contracts in the Italian Mezzogiorno is reported; second, we introduce the basic elements of a principal-agent framework; third the procurement model by Laffont and Tirole is analysed. Finally we discuss to what extent procurement models can be suitably adopted and their policy implications be relevant.

1. Background¹

Southern Italy and the two main islands, Sicily and Sardinia, comprise more than one third of the country population and since the unification of the nation in the mid of last century their development has been lagging behind the Centre and the North. By any standards (GNP per capita, basic welfare indicators including crime rate, availability of infrastructure, productivity of industry and services sector, efficiency of the public administration) there is a permanent gap with the rest of the country, and in the last fifty years an impressive, albeit scarcely effective, range of development policies have been tried to counteract this situation.

More recently (since 1988), the Mezzogiorno has been declared eligible to Objective 1 Structural Funds of the European Union, because its regional GNP per capita measured in PPP ECUs is below the target of 75% of the average EU.

A non negligible part of Government and EU development funds have been deployed to give incentives to large firms based in the North or even to foreign multinationals provided that they locate their investments in the South, following a trend that was tried by other countries (more recently e.g. by Ireland). A detailed account of this policy is given by Florio (1996).

Here we focus on planning contracts between Government and large firms.

¹ This section draws from a forthcoming paper by Florio and Giunta (1998)

This experience is now more than ten years old. According to law 64/1986 for the Mezzogiorno, the State could sign contracts with public and private bodies in order to speed up the development of its major projects, particularly in industrial zones. The idea was further enlarged by legislation passed the same year, where in principle any large national or international company could qualify for a planning agreement by the proposal of investment projects consistent with the Government's development plan for the Mezzogiorno. In the same year a first "vintage" of thirteen contracts was decided.

Following contracts have brought the total number to 27 (see tables).

Table 1 Planning contracts 1986 - 92 and 1992-97 Data for investments, State contributions and employment.*

| Group | Total Invest. (l. bn) (a) | State contrib. (l. bn) (b) | Total employment (no. workers) (c) | New jobs. (no. workers) (d) | Total invest./ total jobs (l. mn) (a/c) | Total invest./ new jobs (l. mn) (a/d) | State contrib./ new jobs (l. mn) (b/d) | State contrib./ total invest. (%) (b/a) | New Jobs./ total employment (%) (d/c) |
|---|---------------------------------|----------------------------------|--|-----------------------------------|--|--|---|--|--|
| BARILLA | 535 | 211 | 635 | 456 | 843 | 1,174 | 464 | 39.5 | 71.8 |
| BULL | 119 | 91 | 250 | 250 | 476 | 476 | 366 | 76.9 | 100.0 |
| ENI | 1,344 | 480 | 3,804 | 719 | 353 | 1,870 | 668 | 35.7 | 18.9 |
| FIAT1 | 3,536 | 1,932 | 28,994 | 1,200 | 122 | 2,947 | 1,610 | 54.6 | 4.1 |
| FIAT2 | 6,260 | 2,800 | 8,020 | 8,020 | 781 | 781 | 349 | 44.7 | 100.0 |
| GTC | 196 | 78 | 390 | 390 | 503 | 503 | 200 | 39.7 | 100.0 |
| IBM | 68 | 51 | 180 | 152 | 376 | 445 | 332 | 74.6 | 84.4 |
| IRI | 1,558 | 1,073 | 5,873 | 1,573 | 265 | 990 | 682 | 68.9 | 26.8 |
| Noell Penny Turbines | 55 | 43 | 70 | 70 | 786 | 786 | 614 | 78.2 | 100.0 |
| OLIVETTI | 667 | 471 | 1,882 | 514 | 354 | 1,297 | 917 | 70.7 | 27.3 |
| PIAGGIO1 | 273 | 88 | 484 | 484 | 563 | 563 | 181 | 32.2 | 100.0 |
| SNIABPD | 755 | 321 | 934 | 664 | 809 | 1,138 | 483 | 42.5 | 71.1 |
| TEXAS 1 | 1,485 | 819 | 1,150 | 1,150 | 1,292 | 1,292 | 712 | 55.1 | 100.0 |
| Total 1st vintage | 16,851 | 8,458 | 52,666 | 15,642 | 320 | 1,077 | 541 | 50.2 | 29.7 |
| ACM | 559 | 309 | 3,373 | 1,887 | 166 | 296 | 164 | 55.3 | 55.9 |
| COMPLASINT | 94 | 48 | 330 | 330 | 284 | 284 | 145 | 51.0 | 100.0 |
| GETRAG | 408 | 213 | 800 | 800 | 510 | 510 | 266 | 52.1 | 100.0 |
| IPM | 199 | 116 | 1,023 | 407 | 194 | 488 | 284 | 58.2 | 39.8 |
| NATUZZI | 581 | 312 | 4,598 | 2,814 | 126 | 207 | 111 | 53.6 | 61.2 |
| NUOVA CONCORDIA | 521 | 255 | 1,574 | 1,574 | 331 | 331 | 162 | 48.9 | |
| PIAGGIO 2 | 290 | 46 | 1,573 | 365 | 184 | 795 | 126 | 15.9 | 23.2 |
| SARAS1 | 501 | 187 | 380 | 380 | 1,318 | 1,318 | 492 | 37.3 | 100.0 |
| SARAS2 | 470 | | 246 | 246 | 1,912 | 1,912 | 0 | | |
| SGS | 638 | 352 | 2,246 | 315 | 284 | 2,025 | 1,117 | 55.2 | 14.0 |
| STOPPANI | 93 | 57 | 140 | 140 | 661 | 661 | 404 | 61.2 | 100.0 |
| TARI' | 105 | 67 | 383 | 289 | 275 | 364 | 230 | 63.3 | 75.5 |
| TEXAS 2 | 2,260 | 715 | 2,275 | 1,025 | 993 | 2,205 | 698 | 31.6 | 45.1 |
| UNICA | 88 | 58 | 688 | 410 | 128 | 214 | 142 | 66.4 | 59.6 |
| TOTAL 2nd vintage | 6,806 | 2,733 | 19,629 | 10,982 | 347 | 620 | 249 | 40.2 | 55.9 |
| TOTAL 1 st and 2 nd vintage | 23,657 | 11,191 | 72,295 | 26,624 | 327 | 889 | 420 | 47.3 | 36.8 |

Source: Florio-Giunta (1998)

Table 2 Planning contracts, period 1986-1992 and 1993-1997

| | |
|--|---|
| Barilla | Extension of the two plants in Foggia, the ones in Matera and Marcianise, the two plants in Melfi and Cagliari. In addition a research centre and three research projects in Foggia |
| Bull HN | Investments in Avellino and Cosenza |
| ENI | Investments in Milazzo, Crotona, Taranto, Porto Vesme, San Gavino, Marcianise, Sulmona |
| FIAT 1 | Reorganisation and extension of the majority of the group's plants in the South, e.g. Cassino, Termoli, Sulmona, Termini Imerese, Fiat Avio (Brindisi, Puglia), Sevel (Val di Sangro, Abruzzo) together with the realisation of nine research centres |
| FIAT 2 | Two plants: one in Melfi (Potenza, Basilicata) for the production of the Punto car and one in Pratola Serra (Avellino, Campania) for the production of engines |
| G.T.C. (Gruppo Tessile Castrovillari) | Company formed by GEPI and the Polli Group, realisation of a cotton textile pole in the area of Castrovillari (Cosenza) |
| I.B.M.: Semea S.r.l. | Investments in Bari, Naples and Catanzaro |
| IRI | Investments in a number of the group's factories in the South operating in the electronic components, telecommunications and transport sectors |
| Italgrani | Agricultural-industrial activities in a number of Southern provinces |
| Noel Penny Turbines | Gas turbine plant in Piano Lago (Cosenza) |
| Olivetti | Twelve high-tech factories: 2 in Pozzuoli (Naples, Campania), 9 in Marcianise (Caserta, Campania), 1 in Carsoli (L'Aquila, Abruzzo). Two research centres: one in Bari and one in Pozzuoli (Naples, Campania). Productive activities located in Marcianise (Caserta) and research activities in Pozzuoli (Naples) |
| Piaggio1 | Industrial investments in Nusco and Grottaminarda (Avellino); in Apicecalvi (Benevento) in Benevento; in Pontedera |
| SNIA BPD | Industrial investments, research and workers' training centres in factories in the provinces of Matera, Brindisi and Cagliari for organic chemicals, bioengineering, polymers and synthetic fibres |
| Texas Instruments1 | Plants in Avezzano (L'Aquila, Abruzzo). Part of the group's strategy for expanding its structures in Italy with the constitution of a pole of high technological content. A residual share is destined for investments in the factory in Aversa (Caserta) |
| ACM (Auto Componentistica Mezzogiorno) | A limited co-operative company comprising 32 firms who supply components to FIAT in Melfi, roughly 80% of them are from Piedmont and the rest from Lombardy; new plants and extensions in various Southern provinces; the most important in Melfi |
| COMPLA SINT (Southern Italian company) | Plant in San Nicola di Melfi (Potenza). About 10% of the investment is destined for research activities |
| GETRAG (German company) | Factory in Modugno (province of Bari) for the production of gears for automobiles |
| IPM | Industrial and research investments in the sector of production of advanced electronics applied to telecommunications and non conventional payment systems to be realised in the plants in Naples (Arzano and Frattamaggiore) and Caserta (Marcianise) |
| Natuzzi | Production of sofas and upholstered furniture in Iesce, province of Matera, Basilicata. It is a new factory realising the entire manufacturing process from supply of materials to the finished product. Other investments in the provinces of Bari and Pistoia |
| Nuova Concordia S.r.l. | Realisation of a tourist pole in Castellaneta Marina (Taranto) integrated with hotel and reception structures and services |
| PIAGGIO2 | Investments for the production of two-wheeled vehicles and variable ratio transmission units in Pontedera (Pisa) |
| SARAS1 | Refinery located in Sarroch (Cagliari). Investment in technological updating |
| SARAS2 | Investments for modernising the refinery located in Sarroch (Cagliari) and investments for a technological "citadel" |
| SGS-Thomson (Italo-French Joint-venture) | A factory in Catania for the development of microelectronics; industrial and research investments |
| TARI Consortium | Consortium of 180 Neapolitan jewellers (craftsmen, industrialists and distributors) located in Marcianise (Caserta) |
| Texas Instruments2 | Investments in the field of advanced electronics. The new structure will supplement the factory already operating in Avezzano; production of advanced electronics in the components sector |
| UniCA | Co-operative of small and medium-sized companies producing footwear in Carinaro (Caserta) |
| STOPPANI Crotona S.r.l. | Production of sodium bichromate in Crotona |

Source: Florio-Giunta (1998)

Basically, the planning contract mechanism, is based on the following provisions:

- a) the Government selects suitable major projects from among the applications submitted by large companies who are willing to invest in the Mezzogiorno (or, since 1992, in some target-areas in the Centre-North);
- b) the company must declare the total investment cost, a breakdown of it by main categories (machinery and other fixed assets; R&D facilities and expenditure; training costs, to be seen as investment in human capital), and increase of personnel: these data must be substantiated by suitable feasibility and technical studies;
- c) if the project wins Government approval, it qualifies for a capital grant, or for soft loans, or both;
- d) however in order to actually obtain the public money, the large firm must commit itself to investment and employment targets for a number of years (usually five), and it faces the risk of having to give back any subsidy cashed if it fails to reach the target (in fact renegotiation occurred in many cases, aimed at a proportional reduction of both targets and grants).

Data on planning contracts have been collected and elaborated by Anna Giunta (Università della Calabria) in the framework of a research project financed by the Italian National Research Council: what follows draws from her work (Florio-Giunta 1998).

The beneficiaries of planning contracts are more frequently large Italian companies, most of them private (like Barilla, Fiat, Olivetti, Piaggio and Natuzzi), in second place we find multinational companies (Bull, IBM, Snia, Getrag, Texas Instruments) or joint-ventures (this is the case of the Italian-French partnership SGS-Thomson). Three contracts involve consortia of small companies (ACM, UNICA, Tarì). In some cases, as with ACM, the localising option was boosted by a pre-existent supplier relationship with FIAT. In the other two cases - UNICA and Tarì - the consortia reflect the old productive vocations of small firms in the area. Some firms engaged in two subsequent planning contracts: these were FIAT, Texas Instruments, Piaggio and Saras.

The industrial sectors involved are: automobile and automobile components, two-wheeled vehicles, advanced microelectronics and chemicals (see Table 1). There are also, although to a much smaller extent, investments in light industry such as furniture, shoes, jewellery and tourism, which were included as beneficiaries by a recent deliberation.

In the first vintage (1986-92) the expansion of the productive base, i.e. initiatives linked to new investments, is achieved with two planning contracts, stipulated respectively with Fiat (Fiat2) and Texas Instruments (Texas1). These are two significant contracts which account for 46% of the total investments for the first cycle and 59% of the new jobs created. The remaining investments involved interventions to restructure existing factories. Given the scope of this instrument, the utilisation of the planning contract should have encouraged an upgrading of the factories, both in terms of extending the research activities (centres and projects) and of enriching the human capital (training and rehabilitation of the workforce). In the first vintage of

planning contracts reorganisation co-exists alongside the extension of the productive base. It can therefore be evaluated as a measure which provides incentives for the reorganisation processes undertaken by the large companies located in the Mezzogiorno . New investments prevail in the second vintage, both in number and in resources employed, and in fact the creation of new jobs accounts for 56% of total employment (in the first vintage this percentage was 29.7%).

One of the characteristics of the planning contracts is the realisation of integrated plans for industrial investments, research and training in the depressed areas. This compound of development objective is pursued mainly in the first vintage: investments in research and development account for an average of 35% of the total investment, and the programmes for enriching human capital, while only residual, absorb roughly 5% of resources.

The second vintage of contracts records a drop in investments in research and development, just 8% of the total investment, and a reduction in training programs for the workforce (from 5% to 2%). Since we have no indication of expenditure for six contracts, these figures should be treated with caution. However, if these results were confirmed, it would mean there had been a distancing from the objectives of closing the technological and human resources gap which inspired this legislation, perhaps focussing on a narrower objective of job creation.

Seven years after the approval of the planning contract only two are officially in the closing stages: FIAT1 and TEXAS1. From other sources it appears, however, that at 31 December 1996 out-payments of L. 4,437 billion had been made, that is almost half of the amount that had been reserved, whereas almost all the new jobs had already been realised. This last figure would lead us to believe that, after ten years, we have reached the end of the first vintage of investments.

For those contracts stipulated in 1994 (ACM, Compla.Sint, SARAS and TARI), at the end of December 1996 the out-payments amounted to 48% of the appropriation and the percentage of jobs created was high at around 89% and we infer they are near to conclusion.

The speed of the realisation of investments in this second phase - two years from deliberation of approval of the contract - signals greater certainty for companies regarding the transfer of resources.

The remaining contracts have been stipulated in the last two years and no data are yet available.

It is also interesting to consider cases of renegotiation of the approved project plans. These were only ever proposed by the beneficiaries. The government solely reserved the right to repeal, which it exercised on two occasions. The revisions can be broadly grouped into two types: updating and modifications. With updating the companies request a postponement of the terms agreed for the realisation of the investment plan.

The modification type includes requests made by companies to change - and that usually meant to reduce - the investment plans originally approved. The motivations advanced by companies

were technological developments and the change in market prospects. The revision was granted by the Ministry on the belief that this did not imply a change in the original definition of the general objectives of the contract in terms of industrial development and employment in the Mezzogiorno.

Let us sum up some key data: total investment costs were estimated at 23.6 thousand billion Liras (12 billion ECUs), of which around 47% covered by public finance; most of the investment was for fixed capital, but contracts covered also R&D and personnel training expenditures; gross direct job creation was forecasted in the range of 26,600 employees (out of a total 72,300 in the plants involved).

If we consider a very crude cost/effectiveness ratio, the existing contracts imply a subsidy of around 420 million Liras (more than 200 thousand constant ECUs) per job created. At a social discount rate between 3-5%, the perpetuity value of the subsidy per employee is somewhere in the region of 12-20 million Liras per year. When compared with actual labour costs in the Mezzogiorno, this implies that around one half of the total labour cost of these projects is paid by the Government for an infinite time horizon. From another angle, because something less than 50% of total investment costs were paid up by taxpayers, we could say the subsidy doubled the rate of return on equity for project financiers.

We do not want to say that this is "excessive" public expenditure: in order to do so one would in principle compare the benefits of additional (net, direct and indirect) employment and output with the social cost of public expenditure, and this cannot be said without a careful study of the single cases. We refer the reader to (Florio-Giunta, 1998) for more details on the planning contracts and for a discussion of their social costs and benefits. We feel that only extensive field-work may allow us to say whether this policy has been successful. However, we can speculate that the contract design we have described is affected by asymmetric information. This is the object of the next two sections.

2. Analytical framework

In the Italian experience the essential ingredients of planning contracts are the following ones:

- a) a capital grant which covers a share of fixed total investments and other eligible expenditures is transferred to a company;
- b) the publicly-financed company makes an explicit commitment typically concerning:
 - a minimum level of investment to be made in a plant located in a target region,
 - the creation of a minimum number of new jobs to be sustained for a minimum number of years,
 - new specific activities such as R&D or training;

c) a mechanism of control over the variables in b) is designed under the penalty of revocation of the capital grant.

Government "pays" firms for inducing development in backward areas. Hence firms that subscribe planning contracts are supposed to produce positive externalities, which arise jointly with their production for the output market. Firms partially internalise the social benefit of a developing Mezzogiorno by receiving grants.

This policy and its contractual design can be interpreted as a principal-agent problem with asymmetric information concerning a key variable which is managerial effort spent on reducing those costs specifically arising from the project being located in the Mezzogiorno (for example extra-cost for infrastructures, for personnel training, for supervision, for search of good local suppliers, etc). This is why we apply the theory of incentives by Laffont and Tirole (1993) to planning contracts. Some restrictive assumptions are necessary in order to simplify the complex and varied context of actual case studies, however retaining the essential aspects of the issue at stake.

First, a planning contract is assumed to concern an indivisible project (e.g. a new plant located in a backward area) that has value S for consumers and that can be realised by a single firm. The value of the project is fixed. In the Italian experience planning contracts do not report any analysis of the macro impact of the new plant. All that matters is investment and employment directly created by the regulated firm. Consequently, the assumption of a fixed value of the project can be less restrictive than any other ad hoc hypothesis on the value generating function. We interpret S in terms of social welfare: the company may produce cars at a profit, but if a plant is located in a target region, it will also provide social goods (e.g. employment and local development) which are valued by consumers.

Second, the project is assumed to require some initial contractible investment $I \geq 0$. Contractibility seems plausible since, as we have already noted, the core of a planning contract is a detailed description of both the investment and the monitoring mechanism, although accurate information on activities such as R&D and training may be either very difficult or costly to gather.

Third, any positive externality arising from production for the output market is costly (e.g. additional costs of recruiting and training labour in a backward area, transport and communication costs). Those relevant costs are named production costs, are represented by C , and are assumed to depend on two variables: a technological parameter, \mathbf{b} , and managers' effort, e . In particular, $C = (\mathbf{b} - e)$. The technological parameter is assumed to be unobservable to both the company and Government ex-ante, while it is observable to the

company ex-post (i.e. after the investment has been sunk). Ex-ante both the company and Government are assumed to know the distribution function of the technological parameter, which is improved by the initial investment. So the level of investment determines a common-knowledge distribution function $F(\mathbf{b}|I)$ for the technological parameter $\mathbf{b} \in [\underline{\mathbf{b}}, \bar{\mathbf{b}}] = B$. Since the lower is \mathbf{b} , the lower are production costs, it is assumed that investment improves upon the expected value of \mathbf{b} , i.e. $F_I = (F|I) > 0$ for $\mathbf{b} \in B$. Moreover, there are decreasing return to investment, i.e. $F_{II} < 0$. Finally, the distribution function shows monotone hazard rate, i.e. $d[F(\mathbf{b}|I)/f(\mathbf{b}|I)]/d\mathbf{b} \geq 0$ where $f(\mathbf{b}|I)$ is the corresponding p.d.f. of \mathbf{b} . In other words the conditional probability that there are no more improvements decreasing \mathbf{b} from \mathbf{b}' given that there are already been $\mathbf{b}' - \mathbf{b}$ improvements increases as the firm is more efficient.

Usually the government counterpart of planning contracts are established firms that intend to have new additional plants in the South of Italy. In this sense, quite realistically, firms are well experienced and aware of the relevant technology. Consequently, the technological parameter \mathbf{b} can be interpreted as a local efficiency variable, i.e. a proxy for all productive conditions to be met in the new location. The assumption that the higher is the level of investment, the lower is the expected value of \mathbf{b} can portray the idea that local infrastructures and accumulation of human capital are part of the financed project. Indeed, building new sites and training are often contemplated in planning contracts.

Alternatively, firms may wish to adopt innovated and capital-intensive production processes in the new location. The common requirements concerning research centres and up-to-date technology would support the above claim. If innovation could be proved to be unambiguously labour-saving, planning contracts would not be a powerful instrument against unemployment.

The managers' disutility of effort is expressed in monetary units and represented by $\mathbf{y}(e)$, with $\mathbf{y}' > 0, \mathbf{y}'' > 0, \mathbf{y}(0) = 0, \mathbf{y}(\mathbf{b}) = \infty$. The function $\mathbf{y}(e)$ is public information while effort is assumed to be unobservable to Government. Instead, production costs are verifiable ex-post. In this way, effort represents the moral hazard component of the planning agreements relationship and in our context it may be exemplified by all those actions that good managers can undertake: e.g. labour productivity can be enhanced by good organisation. Moreover, the assumption according to which performance depends upon an unobservable variable such as effort is a simple way of modelling the idea that a regulated firm provides a service to society in a non competitive setting. Indeed, there is no third party such as an output market that can police managers' behaviour apart from Government.

Let us give an example: having FIAT building cars in a very poor region of Mezzogiorno implies excess investment and additional costs with respect to a Northern Region. We consider

these excess expenditures as costs incurred not to produce cars, but to induce development, and we consider FIAT as a supplier of this social good to the Government. FIAT management can reduce those excess costs by exerting effort. However, since effort and the technological parameter are both unobservable, there is room for opportunistic behaviour. Indeed Government cannot disentangle the company endogenous effort component from the exogenous technological component.

Fourth, Government is assumed to pay the firm a gross transfer equal to $(C + I + t)$ where t is the net transfer and is equal to $(a - bC)$. Public funds have a shadow cost equal to $I > 0$. As reported in the previous section, in the Italian experience the average subsidy is as high as 47% of *total* investment. Total investment includes expenditures that correspond to both the marketable commodity and the social value generated through production. We suppose that location-specific investment plus any additional costs are a function of total investment. Thus, when Government actually pays a share of total investment, it wants to cover development-specific investment and variable costs plus an incentive and refers to total investment as a proxy. The Government objective is to maximise the total surplus of consumers, taxpayers and firm.

Fifth, the payoff of the firm in money terms is assumed to be the difference between the net transfer and the disutility of effort, i.e. $U = t - \mathbf{y}(e)$. Reservation utility is set equal to zero. In this way, the contracting firm is supposed to earn only the net transfer from Government. However, in planning contracts firms usually sell their product in the output market. We argue that only the extra-market impact of the new plant is the issue at stake as if the firm were providing some sort of service beyond the delivery of a commodity. Indeed, in planning contracts there is no specific reference to the amount or type of output that should be produced by the firm apart from a quite general mention of the relevant industrial sector. So the payoff of the firm is interpreted as net profit from engaging in a planning contract.

To sum up, the timing is as follows. At stage 0, the Government offers a contract. At stage 1, the firm sinks investment. At stage 2, the firm learns the efficiency parameter \mathbf{b} , which is not observable to Government. At stage 3, the firm chooses effort and production occurs. At stage 4, production costs C are commonly observed.

Social welfare is the sum of the consumers' net surplus and the firms' rent. It is equal to:

$$S - (1 + I)(I + C + t) + t - \mathbf{y}(e) = S - (1 + I)(I + \mathbf{b} - e + \mathbf{y}(e)) - IU$$

For a social optimum we want expected rents to be minimised, investment and effort to be selected in such a way to incur the minimum cost, given the exogenous technological parameter. The social optimum is characterised by:

- i) the socially optimal investment I^* which minimises total expected costs, i.e. $\left\{ I + \int_B b dF(b|I) \right\}$;
- ii) the socially optimal effort e^* which satisfy $y'(e^*) = 1 \forall b$;
- iii) the socially optimal firm's rent $U(b) = 0 \forall b$.

Whether procurement can or cannot achieve the social optimal welfare depends upon the commitment capacity of the firm. Indeed, the results are quite different under the following alternative assumptions:

- A1.) the firm can commit not to quit the project even for a bad realisation of β ,
- A1'.) the firm cannot commit not to quit the project.

In case A1.) holds, the firm will accept the project ex-ante only if:

$$\int_B U(b) dF(b|I) \geq 0$$

Laffont and Tirole prove that the social optimum can be achieved by a fixed-price contract (i.e. $b=1$) where the fixed price is equal to the disutility of optimal effort. If neither production costs or investment are reimbursed, the social optimum can be achieved by a fixed-price contract where the fixed price is equal to the firm's expected costs (i.e. $\alpha = \int_B \beta dF(\beta|I) - \epsilon^* - \psi(\epsilon^*) + I^*$) and all decisions, investment and effort, are left to the firm's discretion. Efficiency results from the contract being signed under symmetric information. At the time of contracting, the fixed price can well be chosen in such a way that the firm's expected rent is zero.

So the social optimum can be achieved by a fixed-price contract if the firm can commit not to quit the project after a poor realisation of the efficiency parameter. However, even assuming that planning contracts satisfy assumption A1), the transfer does not cover the expected total costs of the firm as it should. Indeed, Government reimburses just a share of the cost of the initial investment, unless that share takes into account marketable production.

Since the firm usually makes a commitment for a quite short time span (about five years on average), it might be argued that assumption A1') should hold instead. If A1'.) holds, the

contract will have to satisfy the ex-post individual rationality constraint $\bar{w} \geq w$. The purpose of the contract will be:

$$|$$

s.t.

$$-$$

where the first two constraints are incentive compatibility constraints.

Setting $\bar{w} = w$, the firm's expected rent is:

$$| \quad \frac{|}{|} \quad |$$

Given the monotonicity of the hazard rate, the maximisation can be rewritten as:

$$\frac{|}{|} \quad |$$

The first-order conditions are:

i) $\frac{|}{|}$

ii) $\frac{|}{|} \quad \frac{|}{|}$

Condition i) states that the net social benefit from raising effort of type θ is the difference between the increased productive efficiency of type θ and the extra-rents earned by types θ .

Condition ii) can be rewritten as:

ii') $\frac{|}{|} \quad \frac{|}{|}$

i.e. the marginal social cost of investment is equal to the marginal cost savings due to investment plus a correction of investment due to imperfect incentives at the production stage. If investment does not increase the hazard rate (i.e. $\frac{d\lambda}{d\theta} < 0$), then investment will be higher than the efficient level.

In conclusion, asymmetric information at the production stage allows the firm to enjoy a rent, reduces the power of the incentive mechanism (i.e. b) and may cause an inefficiently high investment. The intuition behind this result is the following. Government wants to achieve local development through planning contracts but cannot compel the firm to accept losses if the exogenous cost component is very high. In order to offer the company an incentive that may insure for bad realisations of the technological parameter, a positive rent is unavoidable. In this case, the firm enjoys an irreducible rent and investments tend to be inefficiently high.

Laffont and Tirole show that the procurement mechanism can be implemented by a menu of contracts such that:

where θ^* is the announced θ , θ^* is the solution of condition i), $\theta^* > \theta$, and $\theta^* < \theta$.

However, in planning contracts the procurement mechanism is free of any revelation device besides some chance of re-negotiation which is not automatically granted.

Moreover, Laffont and Tirole prove that the rent enjoyed by the firm depends on both the distribution function of the technological parameter θ and the value consumers attach to the project. If G is said more favourable than F when F first-order stochastically dominates G and the hazard rate of G is always not greater than the hazard rate of F , then a firm of type θ will enjoy a higher rent when the distribution function is less favourable, while it will exert less effort when the distribution function is more favourable. However, a type will gain more from the distribution function being less favourable than a less efficient type. So if there were asymmetric information concerning the precision of θ , then the firm would be induced to claim a less favourable distribution function of θ in order to get a higher rent and exert less effort.

Finally, an increase in the fixed value S of the project will raise the rent exploited by the firm. Then the greater is the political pressure on policies fostering economic development in the

Mezzogiorno, the higher is the expected rent that a firm can gain from entering into a planning contract.

In this concluding section we wish to make some additional remarks on interpretation, suitability and policy implication of the model.

In the previous section, we have already discussed the analytical framework, in particular, the assumptions concerning the fixed value of the project, the contractibility of investment, the participation constraint and the relationship between effort and exogenous efficiency in the cost function. Also we have briefly discussed the incentive structure of planning contracts.

Now we wish to expand the latter issue. The Laffont-Tirole (L-T) model has both positive and normative implications. The positive result is that it is very likely that a real world contract that has some analogy with the stylized model of section 2 can generate costly rents. The normative result is that there exist ways to reduce these rents.

We have already argued that the L-T framework of analysis, suitably reinterpreted, can capture some important features of the Italian experience with planning contracts. The key assumption is to consider development in the Mezzogiorno as a public good and the planning contract as a procurement mechanism where the Government is the sole buyer of this good.

Government is expected to offer an optimal incentive and the minimum rent compatible with the constraints. However, we suspect that in the Italian case contract design is such that firms earn an excessive subsidy.

The reasons are the following ones:

First, we did not find evidence about the Italian Government trying to estimate the gross welfare to society arising from localizing an investment project in the South. For standard cost-benefit analysis, the net social benefit of a project is the difference in consumers welfare, evaluated in money terms, between the opportunity costs of its outputs and inputs (including any externality). In the case of planning contracts meant to induce development in the Mezzogiorno, the increase in welfare is just the difference between the social value of a project in the North and in the South. But the companies are not usually required to provide these key-data by the Government.

In fact the Italian Government asked the proposers to declare the expected project employment impact, perhaps as a crude proxy for its local social benefits. While this indicator

is questionable per se², in most cases this impact may be largely offset by actual or potential employment losses elsewhere.

Thus a rather trivial, policy implication of the model is to suggest a careful study of the expected differential welfare impact of the project based on comparative information on local studies.

Second, if a guess estimate of the social value of the project were available, the contract should be designed in such a way as to minimize informative rents. In the Italian case the actual design of the contract, unfortunately, points to inappropriate cost variables because it reimburses a share of total investment costs, while the relevant costs here are differential costs (both fixed or variable costs) between North and South.

We have seen that under certain conditions the L-T optimal incentive can be implemented by a Government that offers a menu of linear contracts where one of the parameter is the marginal disutility of effort. This mechanism may sound too demanding for public administrators, but Government could ask firms to select themselves out of a small number of transfer schemes. Indeed, if Government has an ex-ante knowledge of the range and distribution of differential exogenous costs in the North and in the South, it can offer various transfer schemes and allow the company to choose the most appropriate one in order to keep location-specific costs down. This procedure would need some initial collection, analysis and elaboration of data by Government, but it may show relevant advantages in terms of rent extraction.

Third, if planning contracts are interpreted as a form of procurement, there may be further ways to diminish informative rents.

Government may arrange an auction among competing projects: it is a well known result of incentive theory that well designed auctions in procurement may limit costly rents. We would suggest to consider the whole Mezzogiorno as one development target zone and to invite to submit projects where proposers should declare:

- a) the expected gross welfare increase originated by the location of the project in the Mezzogiorno;
- b) the extra-costs the investor expects to incur in the Mezzogiorno as compared with suitable alternative locations in the North (or elsewhere outside the target region).

For both these estimations, the proposer should calculate the net present values over an appropriate time horizon. Then Government may propose its own estimate of the social value

² For a discussion, see Florio, Giunta (1998).

of the project (based on some region-specific indicator). Suppose there is mutual agreement between Government and the proposer on the value of the project³. Then following Laffont-Tirole (1998, Ch. 7) it can be shown that a Demsetz-type auction for procurement contracts leads to second-best efficiency. In the case of a continuous distribution of the efficiency parameter, the optimal procurement contract becomes the sum of a fixed payment function of announced costs and linear sharing of overruns.

Differently from Laffont-Tirole, we suggest that there can be more than one winner. Perhaps the simplest way to design a multiple-winner mechanism is to allocate a fixed total amount of funds for all the planning contracts, and to allow for a number of auction winners sufficient to consume the total allocation (provided that all their project pass the cost-benefit test mentioned above). The available funds should be allocated on the basis of the expected net benefit of each project.

Finally, there are a few more policy implications that we feel are quite robust:

- a) whatever the relation mechanism, *location-specific* investments and a fraction only of *location-specific* costs must be paid to the company, plus a lump-sum. Government should acquire information not on total investment but on just those investments and costs that are strictly dependent upon the location in the Mezzogiorno.
- b) Some attention should be paid to the factors determining the efficiency parameter. The last one can be seen as a proxy of all those variables that determine local production costs, and Government should be aware that the larger the variance is, the greater the firm's rent is. As a consequence, contracts in areas where local social and economic conditions are particularly unstable should be avoided because they imply large rents.
- c) Moreover, because the irreducible rent depends also upon the assured value of the project, it may be not be advisable to channel funds to those areas where the social value of local development is extremely high, because unemployment is most serious. While counterintuitive, it may be better to focus on not-so-less- developed areas in order not to sign contracts that offer too large rents to private firms.
- d) In any case, it is certainly mistaken to pay different firms a more or less constant share of their total investment costs. The sharing of costs should be endogenous and project-specific.

³ This is a delicate issue: the two parties may bias their expectations in opposite directions and some negotiation may be necessary in order to fix an agreed expected social value.

In conclusion, planning contracts may be an helpful tool for regional development policy. However, Government should learn how to improve the design of those mechanisms. Our suggestion to consider planning contracts as procurement, may allow Government to benefit from the related economic theory and substantial experience.

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