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A STATISTICAL INFORMATION SYSTEM SUPPORTING ENVIRONMENTAL POLICIES

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A Statistical Information System supporting Environmental Policies

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Abstract

Environment and sustainability are key issues for the policy maker. A policy should be first designed and realistically inserted in his proper context (regional, national, european) in order to be correctly assessed. After that, suitable models need to be choose consistently with the policy context and with the evaluation purpose, to make easier the policy maker task. The aim of this paper is twofold. Firstly to propose a Statistical Information System (SIS) approach in order to correctly write the policy and verify its internal and external consistency, secondly to conceive model building with an evaluation purpose and not only with an analytical one. It means that the model could be able to produce indicators useful to monitoring the policy other then macro indicators whose function is to verify its long term sustainability. We apply these concepts to a specific regional environmental policy: the premium/penalty system conceived to implement the separate collection in waste management. The SIS approach allows us to verify the quality of disposable information, to complete and eventually integrate them with ad hoc surveys, in order to build the environmental extended Social Accounting Matrix, the ESAM. Our modeling, evaluation oriented, aims at verify the policy effects in the long term, i.e. looking at structural change concerning all institutional sectors (households, firms and government).

Keywords: Statistical Information System, environmentally extended SAM, CGE models, environmental policies.
Jel classification: D58, Q56, Q58.

INTRODUCTION

The policy evaluation process faces different problems: i) paucity of data to monitor the implementation of the policy, ii) the attaining of the target indicators and iii), the lack of models useful to provide an explanation on "how the policy has achieved its results". Thus, the use of the Logical Framework (European Commission, 2004) fails for the reasons above and reveals his strong inadequacy (Martini, 2009 and Jaeck 2009).

Moreover, standard modelling of policy interventions has some drawbacks concerning the necessity of considering general equilibrium effects of policies in order to control their social final results (Heckman et al. 1998 and Dwyer et al. 2004). Even if such perspective is considered, a further step often neglected is the capability of general equilibrium models to provide policy indicators, i.e. indicators conceived to monitoring the efficacy of interventions other than macro indicators whose function is to verify their long term sustainability.

These problems are extremely relevant if specific policies are considered. In the case of environmental policy under concern, where the number of agents and the complexity of relations involving them (as stressed in paragraph 3 where conceptual modelling is introduced) are relevant, a Statistical Information System (SIS), aiming both to a correct evaluation of information needs and to an optimal databases reconstruction is required.

The aim of this paper is twofold. Firstly, to enhance the purpose of a SIS approach both in order to correctly write a policy and to verify its internal and external consistence; secondly, to conceive the model building process with an evaluation purpose and not only for an analytical one. The paper is organized as follows: in section one the logic and the current praxis are compared referring to a specific policy, in section two a deep analysis of what a SIS is and some practical insights relatively to the environmental policy are provided, in section three the link among policy, information and modelling, by referring to the Computable General Equilibrium (CGE) models, are shown. Finally, in the last section some conclusions are drawn.

1 Ex ante and ex post evaluation

The ex-ante evaluation is performed at the same time of the policy writing process and, by using the conceptual modelling described in the next section, the internal and external coherence of the policy could be assessed. A description of this essential role of ex-ante evaluation is contained in European Commission working document n.1 (E. C., 2006). Furthermore, using CGE models or other kind of formal representations of policy effects, the attainability of policy targets can be verified.

When ex-post evaluation is considered, we imagine that policies are already written and implemented and their results observed. Conceptual modelling is useful also in this kind of exercise as it allows us to understand which data have been created and which have to be created consistently with policy modelling.

In order to evaluate the policy, the formal representation we choose strictly depends on disposable information, the only effectively useful for evaluation purposes. In other words, since model building depends on disposable information, the use of a CGE model approach with scarcity of data or making strong hypotheses about the reconstruction of necessaries information, could produce a weak representative model of the policy context and therefore useless for policy evaluation.

Moreover, by using Cost Benefit Analysis (CBA) is possible to verify if the cost of building a complex model as CGE (versus minor complexity of partial equilibrium models) justifies or not a better evaluation of policy intervention as in some cases the general equilibrium effects of policies are negligible or not detectable. Finally, counterfactual experiments could be sufficient to assess policy effects if the causal link is evident or not complex and/or when general equilibrium effects are not to be considered.

1.1 The Sardinian environmental policy

In this paragraph the specific policy under concern is considered. In 2004 the Autonomous Region of Sardinia started a program aiming both at the developing of the separated waste collection and at the increasing of the wet-waste collection percentage. (Address Act of Regional Government n. 15/32 of 30/03/2004). By means of this Act, in absence of a Regional Plan for Urban Waste Management

(formally approved in 2008) and considering that Sardinia shows the lowest percentage of separated collection among the Italian regions (in 2002 it was only 2,8%), a premium/penalty mechanism was introduced. In this respect, an analytical framework to understand if and how such mechanism has modified institutional sectors behaviour is suggested. Furthermore, since we observe that this Act was followed by other similar Acts, we need to understand if such modifications substantially altered the mechanism or they may be considered as simple target modification. In other words, we should verify if the observed separated collection percentage in 2008 could be entirely attributed to the 2004 Address Act or, alternatively, if it has to be considered as the final effect of a collection of Acts.

We need both to fix the boundaries to the SIS and to emphasize possible threats to our evaluation such as effects of contemporary policies as well as modifications of the same policy. In other words this step allows us to consider if the effects we observe could be entirely attributed to the policy under observation or if they are the consequences of other interventions.

In Table 1, consistently with the previous description, the last four years progress in separate waste collection is shown. Thus, by using an appropriate tool, our purpose is to understand what is happened and which could be the future progress of such policy as the maintaining of this trend could be more difficult.

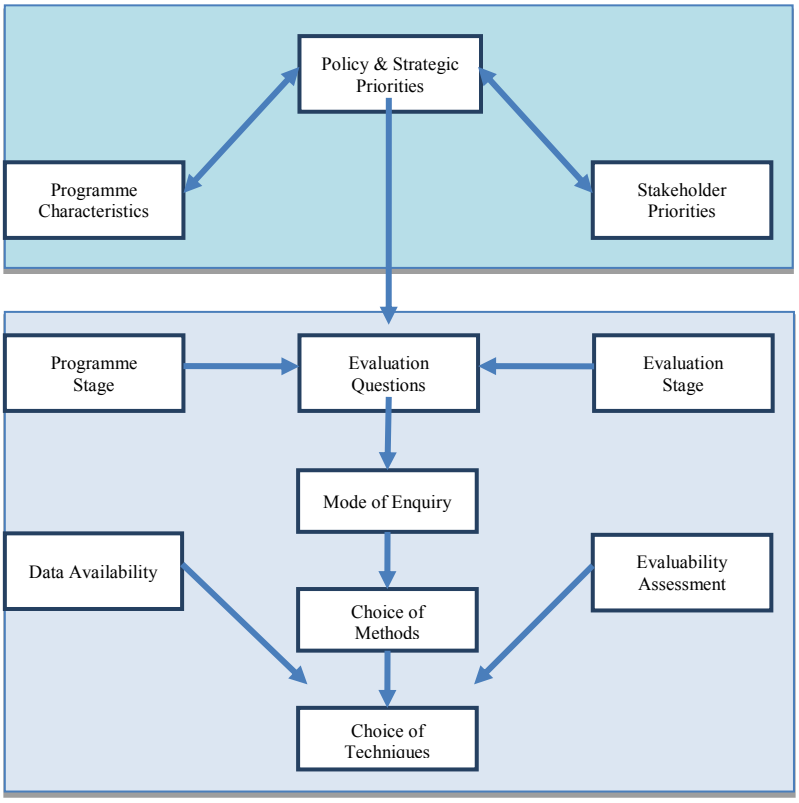
Table.1 Data of waste and separate collection in Sardinia (2004-2008)

Years	*Waste Separate Collection (%)*	*Municipal waste per-capita production (yearly Kg/inhab.)*
2004	5,30	532
2005	9,9	529
2006	19,8	519
2007	27,8	519
2008	34,7	507

Before going within the SIS building process, the objective of the next section, we make some further reflections about the policy order timing.

1.2 First policy and then instruments

Bezzi (2004) stressed that techniques are essential as they make possible the evaluation but their choice is only the last steps in the evaluation process. Similarly Rossi et al. (in Stame, 2007) observed that the evaluation design is a mix among the context and the evaluation tools possessed by the evaluator. The Evalsed Guide (European Commission 2004) summarises this multifaceted concept of the evaluation research path in the following scheme:



Here we find all the elements of our logic. Starting from the close relation among data availability, evaluability assessment and putting in evidence an explicit time perspective; the choice of techniques is the

end of the logical chain, consistently with the above theoretical corpus. Nevertheless this temporal lag pertains to the ancient evaluation process where the first step was the policy design and after its evaluation.

Instead, we propose that policy writing and evaluation process need to work simultaneously, according to the interpretation of ex-ante evaluation proposed in the E. C. working document n. 1(2006): "the ex-ante evaluation should be an iterative and interactive process with evaluators undertaking the different components of the evaluation at different times as the programme is prepared".

2 A Statistical Information System for impact evaluation

"Italian official statistics is promoting the statistical usage of administrative data sets for economic and labour market analysis. In Italy, the first integration's experiences between economic administrative archives and statistical surveys began at the end of the eighties, following the Scandinavian countries experiences (Martini, 1995). Starting from these original experiences the actual approach is oriented to promote the coordinated treatment of administrative sources: by this point of view, moreover, italian legislation, following european regulation (CEE Directive n. 322/97; CEE Directive n. 2186/93 and CEE Directive n.58/97) obliges Public Administrations (PA) (d.lgs. 322/89; d.lgs. 39/93) to fulfil the link between their informative systems with the national statistical system in the perspective of a more diffused usage of statistical archives (D.P.R. 445/2000)" (Martelli, 2007).

Nowadays institutions are called to a role in which knowledge and statistical information become indispensable resources (tools for the complex system governance) of government. In fact the SIS are expressly provided in "Testo unico degli Enti Locali" to support the decision of the PA (cfr.art.12 of the TUEL, c.1, 2), in the belief that an adequate information system is essential to properly address the size and the complexity of the institutional tasks.

2.1 Statistical Information System: design and construction

Under this approach, the SIS ensures: i), a sufficiently broad knowledge base ii), a consistent and flexible framework to support different typologies of decision making and public interventions. Before considering its role in decision-making and government, we define what a SIS is.

According to Istat (Italian National Statistical Institute), a SIS is defined as an information system characterized by the use of aggregated data where, by using information, statistical knowledge is produced. It devotes a special attention to metadata and meta-information. For UNECE (2000), a SIS is oriented to the collection, storage, processing and distribution of statistical data.

It is important to stress that a SIS implies an observer, a variables selector and an institutional purpose that justifies its existence. Furthermore, in a SIS, the user's presence, recipients and a memory system are implied.

"SIS, in its different components, has origin from responsibilities and informative needs of entities and institutions acting as observers and from agents who in the reality want to be informed about. Usually a SIS has a clear and well defined institutional identity. It will be formed by different elements interacting and sharing data and information between themselves. Indeed, SIS building process must be designed in order to facilitate this cooperative aspect" (Martelli, 2007).

The SIS is a global system in which a statistical meta-information system and a data warehouse exist. The data warehouse is metadata driven. It means that stored data are managed by metadata and every change of the data structure must be driven by previous metadata changes. So far, we have described the general features of a SIS.

In the next paragraph, by focusing on the case of environmental policies, in order to clarify the SIS utility in the policy evaluation conducted by using CGE models, a description of the SIS building process is provided. Furthermore, in this particular case the logic under the SIS is fundamental since the source of the data is administrative and integration with economic data is required.

2.2 Statistical information system: ex ante evaluation

Once a new policy is to be written, one has to ensure both its coherency with other policies already implemented and if its objectives are clear and attainable. Thus, we need to write the policy and build the conceptual modelling of the policy simultaneously.

Conceptual modelling allows to highlighting all the agents involved and the relationships between them. The agents (public and private institutions) are at the same time both responsible for the policy

objectives achievement and recipients of the policy itself. If the policy is correctly written, the interaction among agents produces relations and creates databases which are used in policy analysis. On the other hand, if the policy is unclearly written it is possible that these relationships produce incomplete or redundant archives so that the same information will be contained in multiple stores and/or maintained by different agents. The task of conceptual modelling is precisely to help the policy maker by identifying agents and relations among them.

Other benefit of the conceptual modelling consists in putting the policy within the wider set of similar policies (those having the same goal), in order to ensure that objectives are in accordance with those contained in other laws and, finally, that they are reachable. Only with by this modelling we can understand if their achievements depend on the policy adopted or they are the result of other policies that operate at the same time.

However, it is not always possible to perform conceptual modelling simultaneously with the policy writing process due to the fact that policies already written need to be evaluated. In this case it is useful to adopt the SIS as well, even if it offers a minor support.

2.3 Statistical information system: the case of environmental policy

If the decision to assess the policy is taken when the policy has already produced their effects, it is more complicated to evaluate it correctly due to the fact that we do not know if we have stored the adequate information. Modelling the policy is needed both to "find" all databases expected in the policy's text and to verify if they were built.

The instrument's choice to perform the analysis depends on which data were stored and can be used. Thus, only when the policy's evaluation process starts before its implementation the right tool for the evaluation depends on the object of the policy and not on the available data. However, it is important to bearing in mind that not all necessary usable data for a given instrument are disposable and therefore a less suitable tool, adequate to the data collected, has to be used.

In our case we choose to evaluate a policy able to change agents' behaviour by using a CGE model, which seems to be the best way to do it. However, before conducting the assessment we must verify the possibility to elaborate a CGE model by checking all created files and by

integrating them with ad hoc additional information. Finally, that the number of hypothesis/constraints assumed does not affect the proposed model.

From now we call ESAM-SIS the SIS we want to build to collect data to implement the ESAM that in turn will be used as data source for the CGE model.

The main features of this SIS are: i)an observer who defines the information requirements. In our ESAM-SIS the Observer is the Chief of the Regional Environmental Department, who decides the general strategy for the development of dry-wet collection in "Deliberazione della Giunta Regionale del 30.3.2004 (15/32)"; ii) an institutional purpose, the legislative source, which justify the construction of the SIS. In our ESAM-SIS the Institutional purpose is "Deliberazione della Giunta Regionale del 30.3.2004 (15/32)"; iii) the users, i.e. the recipients of information. In our case they are the 377 Sardinia's municipalities and all the other users involved in waste collection, including the Chief of the Regional Environmental Department; iv) a data warehouse. Every municipality has to store up its information and other users as well.

The SIS building process consists of 4 steps: i) Requirements analysis. We call requirements all information needed to describe fully and accurately the system we want to build: laws, standards, regulations and circular notes, etc.; ii) Conceptual modelling. Used to represent in a simple and effective way all relevant aspects of policy analysed; iii) Logical design. Its aim is to translate the conceptual schema, expressed in a semantic model, in a representation (logic model) that depends on the type of automatic data management system (data base management system - DBMS); iv) Physical design. At this stage we choose physical storage parameters, we define both the storage areas and the data warehouse design.

Below, we analysed only the first two phases. We omit logical and physical design because they relate to the construction of databases and therefore are well known procedures.

In the requirements analysis, we collect all information related to the policy to be assessed: laws, standards, regulations and circular notes. In this phase, we traduce all requirements into a graphical language. Conceptual modelling (represented by an Entity/Relations (E/R) diagram) helps us to identify agents involved. They are public and private institutions who, through their interaction, produce relevant information

for the evaluation process. The requirement analysis starts with the law's textual analysis. Below we consider some excerpts of the 2004 Address Act. The analysis of this text helps us to determine precisely the evaluation object, agents involved and the reason to use a CGE model as assessment tool.

Through the Address Act (AA) "Delibera della Giunta Regionale n. 15/32 del 30/03/2004" the regional government implemented the "Piano Regionale di Gestione dei Rifiuti Urbani del 1998". The aiming of these regulations, by means of specific actions, was to strength the principles of municipal waste integrated management: the development of recycling and the decrease of using dump as a method of final disposal.

At the time of the AA emanation, the Sardinian's level of separate collection locates the region at the last places between Italian regions (2.8%). Thus, the Regional Government with this Address Act decided both to modify the waste delivery tariff to the treatment/disposal consortium plants and to introduce a premium/penalty mechanism, according to these principles: a premium to the virtuous municipalities and a duly penalization for the municipalities not adopting systems of separated collection as they cause an excessive pressure on the treatment system.

In order to prepare the waste collection system to the moment of full efficiency of all plants and progressively to achieve higher levels of recycling, the same AA introduced a premium/penalty mechanism to users used to do standard separation required by the national and regional regulation.

By and large, the premium/penalty mechanism works in two ways: i) an instantaneous tariff reduction relating to the wet waste flow, separated before being transferred to plants. This reduction concerns municipalities that have an effective dry/wet separation system; ii) a tariff increase related to the not-separated waste flow. It applied to municipalities not making a significant dump separation and continuing to bring not-separated waste to disposal plants.

With this Act, different operating procedures for each kind of disposal plants existing in Sardinia are established as well but they are not listed here as they are very specific. The Act finally states that costs and benefits arising from this mechanism should be kept in a separate income statement. The surplus of this statement will be used to further

reduce the waste delivery tariff for virtuous municipalities and/or improve separate waste treatment plants. When this statement balance will become zero or negative, it means that the dry/wet waste collection system has attained expected results, so that the mechanism could be redefined.

Conceptual modelling allows us to identify all the agents involved such as: sub areas with fully operational treatment plants, sub areas with treatment plants designed but not really operationally, municipalities in the Sardinian central area, municipalities in the northern area and districts that have not yet build treatment plants.

Even if each municipality group respond to the same rewarding mechanism, they have different objectives to achieve and different premiums/penalties sum at disposal. Each relation among the agents produces an archive, usually containing administrative data. If archives are built following standard rules for data-warehouse and keeping track of metadata, they could be not only consulted but also integrated with archives produced by other agents of the SIS. The integration of all archives appearing in the E/R diagram (as part of conceptual modelling) is the core of the SIS. In our case study it constitutes the ESAM-SIS inspired by a specific goal: the evaluation of the 2004 AA of the regional government.

From above it is clear that when we decide to perform a policy analysis by using a CGE modelling, the SIS approach (both general and specific) is very useful to identify all archives created and consequently to check if they allow this kind of modelling. By this way, we check which archives are effectively built throughout agents involved by the E/R diagram and, subsequently, we decide if missing but necessary information could be produced by ad hoc surveys. Such survey will became part of the ESAM-SIS and could be realized to allow their integration with all other existing archives. The final output of our research will be a data-warehouse able to fill all the cells/blocks of the ESAM, specially conceived to respond to our evaluation purpose. In the next section, the importance of SIS approach will be clarified.

3. CGE models as evaluation tool for ex-ante and ex-post impact evaluation.

The range of CGE models' applications for policy evaluation includes issues such as international trade, public finance, and environmental policies. Devarajan et al. (2002) suggest that economic models, to be useful for policy impact analysis, should have three particular features: a) policy relevance, b) transparency, c) timeliness: models should be implemented with recent data.

The criteria (a) and (b) suggest the use of structural models, in fact the model must incorporate explicit links between policy variables and economic outcomes, in order to identify the structural relationship. Policy relevance requires analysis of interest for the policy evaluation. In other words, while the academic research might lead to a focus on aggregate indicators as aggregate welfare, the policy maker is more interested on identifying who gains or loses from the implementation of a specific policy. The issue of transparency argues that the model has to explain any empirical result and the causal chains involved by parameters, structural data, and behavioural specification. Timeliness is very important in the evaluation process since the impact analysis of past policies could be very useful in order to draw feedbacks for new policies designs.

Moreover "the commonly made assumption of an underlying optimizing behaviour of all agents explains why…general equilibrium theory has strongly increased their relevance for policy analysis" (Conrad, 2002). Thus, the outcome of the model is not generated from a black box but can be traced back to rational behaviour. Since the policy's mechanism discussed above tends to change economic agent behaviour, it is essential to analyse the agent's behaviour and, thus, CGE models can be considered as the best tool to evaluate this specific environmental policy according with the logic "before policy then instruments", stressed in section three.

There are essentially two kinds of parameters that need to be estimated in the CGE models; share parameters and elasticity parameter. Share parameters (as intermediate input costs, consumer expenditure etc.) can be estimated by using a social accounting matrix (SAM), assuming the base year represented by the SAM as the equilibrium solution of the model. The values of the "key parameters" such as the

elasticities are obtained by using econometric estimation of individual relationships both by modeller and by external literature.

3.1 Regional CGE model as a tool to evaluate the specific policy

The data set of the model will be the Regional Environmental Extended Social Accounting Matrix (RESAM), whose construction still accomplishes the first steps (Ferrari, Garau and Lecca, 2010). Based on it, the CGE model can be designed and estimated, leading at environmental-economic parameters estimation that might enable to evaluate the specific environmental policy which we have chosen. From now we call the specific CGE model a Regional CGE model, regional because it is based on RESAM.

Partridge and Rickman (2007) pointed out that the use of policy-oriented CGE models to regional economics is somewhat recent and they quote paucity of regional data as one possible reason. Other reasons regard theoretical complications such as the appropriate definition of factors mobility at a regional level and regional product differentiation. By and large the RCGE models structure is quite similar to the national CGE so that firms seek to maximize profits and, household objective is the utility maximization.

3.2 The RESAM building process

The RESAM will be based on the Regional SAM (Figure1); the accounting framework used is the Social Accounting Matrix for Sardinia, related to the year 2001 (Ferrari, Garau and Lecca, 2009). The RSAM includes thirty sectors and the value added is shared between capital and labour. The institutional sectors are represented by Household, Firms and Government, which consume commodities and save. Households are disaggregated into six income groups and government is a consolidated sector, merging central and local government levels.

Figure1. Stylized SAM

	PRODUCTION	FACTORS	INSTITUTI-ONS	ACCUMULA-TION (Capital Formation)	ROC/ ROW
PRODUCTION	INTERMEDIATE INPUTS		Consumption	Investments	Export to ROC/ROW
FACTORS	Factor Payments				Factor income from
INSTITUTION		Income from Institutional sectors	Transfers	Government net debt	Transfer from ROC/ ROW
ACCUMULA-TION (Capital Formation)	Depreciation		Institutional saving		Foreign and interna-tional saving
ROC/ROW	Import from ROC/ROW	Factor income	Transfers		

Source: Ferrari, 2001

The Regional ESAM will be a matrix where pollution abatement activities are extracted from production activities: pollution clean-ups and other environmental services are treated as special inputs in production process and, according to Xie (2000), environmental taxes, pollution control subsidies and environmental investments are separately accounted.

As shown in Figure 2, sub-matrices (or blocks) will be modified in order to incorporate the environmental-economic relations. In particular, the block of the intermediate consumptions will be split into two parts; the first one concerning the productive activities and the second one referring to the introduction of a new sector (waste sector), in order to remove pollutants. The consumption and transfers blocks will be decomposed as well. The first step consists of the environmental extension of the production sub-matrix, achieved by making endogenous the cleaning sector. In order to make that, the demand for cleaning service by sector will be related to the waste generation. In this way, the actual demand for cleaning is determined.

The waste sector will be split into waste urban disposal, special waste disposal and special dangerous waste disposal. Afterwards, the primary income distribution blocks are reconstructed (factors payments and income to institutional sectors), consistently with the RSAM.

Final demand will be decomposed and environmental investments are determined on a regional basis. It is very important, for our purposes, to have the Waste sector separated from others sectors; by this way in fact we have the information to model this sector in the RCGE and therefore to evaluate the separate collection of waste policy.

Figure2. Environmental SAM

Environmentally SAM		**Production**		**factors**	**Institutions**	**Capital Formation**		**Foreing Sector**
		Activity	Waste	*Capital Labour*	*Households Firms Gov*	*K*	**Environmental Investments**	*ROW*
Production	*Activity*	X			**C**		H	**E**
	Waste Sector							
Factors	*Capital Labour*	**F**						**FW**
Institutions	*Households Firms Gov*			**Y**	**T**			**TW**
Capital Formation	*K*	Dk			S			
	Environmental TAX	Dh						
Foreing Sector	*ROW*	**I**		**YW**	**C W**	**B**		

Source: Ferrari, Garau and Lecca, 2010

The next step, following Allan et al. (2004), will be to make endogenous the demand for cleaning by sectors, using data on waste generation. In this context, each sector faces a demand for cleaning relating to its waste net production (net of that part directly carried out in-house). In order to make endogenous the demand for cleaning, a useful administrative source will be used, the Waste Report containing data on waste production by sectors.

Environmental investments (the grey column in Capital Formation) will be obtained by using national data about environmental statistics produced by ISTAT. Investments included in RSAM are disaggregated, using composition of investment by different type of Machinery and equipment, derived by the national Input-Output table

(IOT). Consistently with ISTAT survey, in Regional ESAM (RESAM), company whose principal activity is waste cleaning doesn't have environmental investment.

Finally, if one considers final consumption activities, it is necessary to understand how urban waste tax (TARSU) operates. Nevertheless, it is desirable to build a SIS to check the municipalities' behaviours concerning separated waste disposal. This system could constitute a new instrument available for the fine tuning of the premium-penalty mechanism.

By using the RCGE, based on the specific RESAM, to assess the policy, we are able to detect direct and indirect effects of the policy and we provide to the policy maker a comprehensive feedback. For example, by the results of the model we can observe an increase in efficiency in waste disposal sector. This increase may generates, in the short run analysis (capital and labour are kept fixed), an increase of the unemployment. In the long run analysis we can understand the amplifiers effects: as capital and labour are no longer fixed, by the increase of the efficiency we can observe an increase in labour demand (in the recycle waste sector for example) and a consequent decrease in unemployment initially generated and, finally, a possible fall in prices leading to increased household consumption and therefore the Gross Regional Product (GRP).

Conclusions

The aim of our paper is to provide a comprehensive framework for the policy maker in order to understand and subsequently to assess the effects of the premium/penalty mechanism introduced with the 2004 Address Act. In section two we compare the logic and the praxis of the policy evaluation stressing the importance of a correct understanding of the timing perspective. In section three we show how the adoption of the SIS approach can help us in separating policy effects.

Between writing the policy and its assessment it is possible that other policies, new or already on-going, although with partially different objectives, may contribute to the achievement of the objectives of the policy under evaluation. In this case the Requirements analysis of the policy helps us to find such policies. Instead, Conceptual modelling allows us to keep separated the effects of this policy from other policies effects.

In our case study, we observe this kind of situation. After 2004 other Address Acts, which could be contributed to 2004 target achievement was emanate, but this eventuality is already taken into account in 2004 Address Act. In the annexe of 2008 Address Act (delibera di Giunta n.75/18 of 30.12.2008) a target modification that does not alter the premium/penalty mechanism is proposed. Finally when we are faced to the CGE building process, we can imagine that households and firms behaviours are solely affected by the first Address Act.

Concerning the SIS approach, in order to make effective the ESAM-SIS realization and a concrete policy evaluation, the logical and physical design of the SIS must be performed. Only these two phases allow to perceive the state of available data bases and to implement, as stressed along the paper, a version of CGE consistently with policy target but also with available information.

In fact, CGE models is the appropriate evaluation tool for our case study as it captures both direct and indirect, inter-sectoral, inter-regional and inter-temporal effects induced by policy implementation. The clear microeconomic structure with links between micro and macro aspect of the economy makes CGE models the optimal tool for quantitative analysis and, furthermore, this instrument is very useful to build a bridge between economists and policy makers.

The aim of the policy, as stressed above, is to modify households and firms behaviour in a sustainable way and CGE is an instrument able both to analyse and evaluate it. The questions driving the policy debate must drive the models.

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