QUANTITATIVE MODELLING OF CULTURAL HERITAGE ECONOMIC BEHAVIOUR

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Economic efficiency: system approach

System approach offers a tool of enterprise efficiency analysis in a context of a surrounding economy. Depending on a level of generalisation it is possible to distinguish between local-efficiency and macro-efficiency.

Local-efficiency takes into account relations of the enterprise with local or regional economy. Macro-efficiency is regarded as analysis of influence of enterprise activity on the state or global economy. Despite the technical problems of analysis on the global level there are no changes in adopted methodology and the same method of analysis, similar flow charts and graphs are used.

Modelling of a system including a cultural heritage institutions (let us call them "CH enterprise"), local community and economic environment of a country has several advantages. Properly designed system model allows to:
- graphically represent the system for education purposes,
- clearly visualise consequences of lack of some data,
- ask better formulated questions about existing relations,
- include or even discover new relations existing between economic actors,
- introduce realistic simplifications necessary to:
- design databases,
- do numerical modelling for quantitative analysis.

Isolated Cultural Heritage enterprise

Economy analysis based on book-keeping data and calculated indexes like benefit/cost ratio or enterprise profit shows that CH enterprise does not generate any profit and is financed by the society through a system of subsidies and donations. Local-efficiency analysis of CH enterprise isolated from local community and country economy gives negative result as its income (sales, financial operations, property renting) is (usually) lower than costs incurred. So at the enterprise level there is:
(Income – Costs) = Profit < 0
At this local level of analysis no other economy conclusion can be drawn as there is no analytical mechanism which can help to collect and use other important information.

This is due to the lack in analysis of feedback loops between the enterprise and its social and economic surrounding. The first step in efficiency analysis is a graphical representation of costs outflow due to the enterprise activity. Enterprise income is represented by sales (admission cards, tickets). Costs include supply and service liabilities paid other local and state companies as well as foreign enterprises, salaries, taxes, similar duties and possible capital cost. The costs outflow can be found in [Bojarski 2001] where more detailed cost categories are discussed. In the next section the cost chart is embedded into graphical model of a local community.

Macro-model with feedback loops

System efficiency modelling at macro-level is presented for state economy [Bojarski 2001] which can be regarded as a single country rather than federation of countries as fiscal revenues are due in the country where the enterprise is based. This is consistent with nowadays regulations in Europe and in this sense presented modelling is related to European/global economy.

To model economic relations of CH enterprise with surrounding economy it is necessary to embed its cost outflow model into a model of local (regional) community economic environment and then this new model into the model of state (country) economy. Simplified financial flow chart resulting from CH enterprise activity is shown in Figure 1 and represents graphical model of our economy system. Primary financial flows are the enterprise costs already known from the local analysis. They are specified as real costs and "costs returned to budget". Real costs are only salaries paid local and state population, capital costs (credits) and supply and service liabilities paid another local and state enterprises.

At the local level additional market actors are community budget and funds, local population and local enterprises. Banks and financial institutions are situated outside the local community as in fact they operate on national or trans-national level. State budget and public funds, remaining state population and remaining state enterprises appear at the state level. To complete the primary financial flows in the model it is necessary to introduce a state border

and foreign countries to consider custom duty and excise flow into the state budget generated by import of goods and services.

Environmental charges, profit and company tax have a marginal economic effect in case of CH enterprise if any at all and are included in the model for a generalisation only.

It follows from the model that a great amount of costs is related to fiscal and other duties. These are "costs returned to budget" and include wealth taxes, transport facilities and revenue duties, personal income taxes of local and state population, social insurance, VAT, excise imposed on home and imported products and custom duties. There are also flows which can be classified as "avoided budgetary costs" and include decrease in pensions and compensations paid unemployed by community and state budgets. This decrease of unemployment is of a direct nature (people working in CH enterprise) and indirect one – in other local and country enterprises.

Costs returned to budget and avoided budgetary costs can be reinvested in state economy increasing its macro-efficiency so their graphical representation in the model is the same. Including in the model the costs returned to the budget and avoided budgetary costs changes the economic situation of CH enterprise. It is not any more an amount of sale which is important but there exist also the other countable economic effect of a great social importance.

It must be pointed out that graphical blocks of "local and state enterprises" represent all the existing enterprises while financial flows of "supply and services" only the amount of liabilities paid by the CH enterprise. This understanding is important because our model includes also flows denoted Pl and PS which represent changes in production and supply of goods and products [Bojarski 2001] generated thanks to existence of cultural heritage but not necessarily bought by CH enterprise.

To understand a role of Pl and PS flows let us discuss two examples.

First example – business company

Introducing computers on the market decreased sale, production, employment and costs returned to budget in the typewriter industry. So even in the case of overwhelming positive impact of some enterprises there usually exist some negative changes in economy of other enterprises.

Second example – CH enterprise

Instead of evaluating results of introducing another cultural heritage on the market let us assume that one of them disappears (e.g. because of lack of subsidies). The amount of resulting negative consequences is exactly equal to positive flows Pl and PS generated by existence and activity of our CH enterprise. And this negative consequences are really large. To mention only a few relevant let us imagine how many hotels and restaurants would disappear if there is no more world recognised cultural heritage in Paris. How many flights would be cancelled? Do the same number of students come to study in Paris if Montmartre doesn't exist? How great would be unemployment increase?

Methodology of answering these questions is not yet satisfactorily developed. But these two examples show two very important features of **P**l and **P**S flows in the case of CH enterprise.

First – unlike the other companies, CH enterprise generates only positive changes to system efficiency. Second – positive flows **P**l and **P**S might be much greater than any other flows in the model. Thus from the point of view of macro-efficiency modelling it is very probable that cultural heritage should be regarded as a very efficient enterprise although existing thanks to society donations and subsidies.

Figure 1. Financial flow chart resulting from Cultural Heritage enterprise activity [Skłodowski 2003].
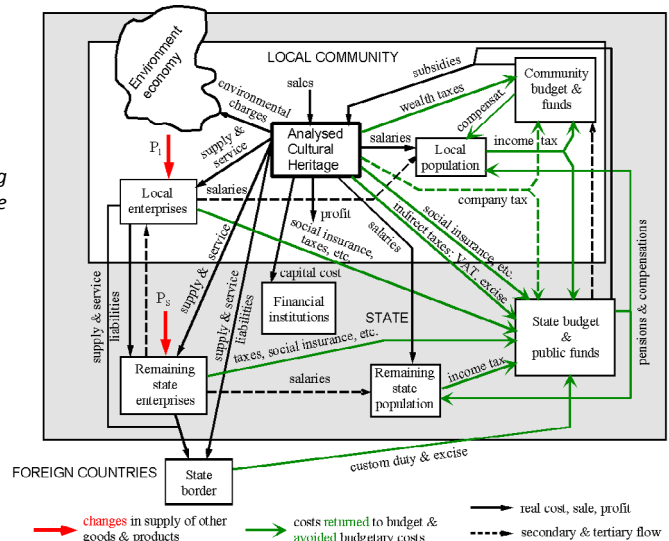
Conclusions

Book-keeping level of analysis and its efficiency indexes (e.g. cost/benefit) are not adequate to analysis of cultural heritage market efficiency.

System approach to modelling of cultural heritage efficiency shows that Cultural Heritage is the sector without negative economic feedback – it generates ONLY increase of production in other sectors.

References

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