Building Investments for the Revitalization of the Territory: A Multisectoral Model of Economic Analysis*

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Abstract. Following the crisis generated by the financialization of private real-estate, construction prices have gradually decreased depriving the housing market of the necessary growth stimuli. Many countries have set up measures to revive this highly strategic area for the national economy. With reference to the Campania Region Law n. 19 dated 28 December 2009, known Housing Plan, this work has two objectives: to recognize the fundamental estimation problems that need to be solved in the implementation of the Campania Housing Plan; in addition, predict the effects of the regulations on the regional economy, both in overall terms as well as for each production sector, with particular attention being given to the construction industry. Regarding the first objective, the contents of the law are analysed on the basis of the principles that govern the appraisal. The consequences of the Campania Housing Plan on the economic system are then evaluated using *input-output* matrices, which are able to capture the structural relationships that exist among the various productive sectors. The numerical calculations require a preliminary investigation aimed at collecting a list of interventions approved by local governments in accordance to the Housing Plan. The cost of the works, as proposed in the applications submitted to the local administrations, is the *input* data for the implementation of the *Social Accounting Matrix* 2010 of the Campania Region.

Keywords: housing market, regional economy, inter-sectorial matrices.

1 Introduction

With the Order dated April 1, 2009[1], the Italian government has encouraged the promulgation of regional regulations with the aim of revitalizing the construction industry. The initiatives promoted in this field have a twofold objective. On the one hand, to revitalize the national economic structure, by acting on a sector that is capable of a strong recovery[2]. While on the other, to respond to pressing housing needs of

* This paper is to be attributed in equal parts to the three authors.

[1] An agreement between the State, Regional and local authorities, under article 8, comma 6, of the Law dated 5 June 2003, n. 131, on the Act relating to the measures to revive the economy through construction (Acts archive n. 21/CU of April 1, 2009).

[2] «The building industry in Italy accounts for 10% of the GDP, with about 2 million workers, of which 65% are employees» (www.fenealuil.it).

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the growing number of disadvantaged families through *social housing*[3] projects. The main initiatives allowed by the national regulations aim to a) improve the architectural quality and energy efficiency of buildings, and b) simplify the bureaucratic procedures in granting concessions.

Under Presidential Decree 616/1977[4], each Region has transposed the content of the Order into its own Regional Law (R.L.) (known as Housing Plan) for the governing of the territory. With Law n. 19 dated 28 December 2009[5], as amended by Law n. 1 of 5 January 2011, the Campania Region has four main categories of private intervention: 1) increase in the volume of existing assets[6], 2) demolition and reconstruction of buildings, not necessarily in ruins, with an increase in volume, 3) rehabilitation of degraded urban areas, and 4) change of use for residential purposes of existing buildings. The redevelopment of depressed urban areas aims to, in addition to exploiting the existing building and urban patrimony, solve the housing problems of young couples and disadvantaged families, by providing that a part of the changes made are dedicated to building social housing. The eligibility of the works included in the categories listed is subject to the submission of applications within a set time period and in accordance to the constraints and construction methods specified by the Regional Law for each type of intervention.

This paper proposes the estimation of the economic impact created by the Housing Plan Law in the Campania Region. Firstly, the study analyzes the evaluation issues arising from the Regulation. This is followed by a survey of the applications submitted and of those actually granted by the local authorities, measuring the effects that the realisation of the proposed works may have in different production sectors. Quantitative procedures based on the use of *inter-sectorial matrices* are adopted. The model, based on inferential mechanisms, is applied to a sample taken from a vast area in the province of Salerno. The results obtained characterize the effectiveness level of the provisions of the Law in the revitalization of the regional economy. The calculations carried out define an analysis process that can be easily exported to other regional contexts.

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[3] According to the European Coordinating Committee for Social Housing (CECODHAS), *social housing* is to offer «accommodation and service with a strong social connotation, to those who fail to meet their housing needs in the market (due to either economic reasons or lack of an appropriate offer) in an attempt to improve their condition».

[4] This Decree has given exclusive power over urban planning to the Regional administrations, with the State having a role of guidance and coordination of the asset as well as protecting the territory, and specific tasks assigned by the legislation of the sector.

[5] "Urgent measures for the economy, the re-qualification of existing assets, the prevention of seismic risk and administrative simplification".

[6] It should be noted that, according to the amendments made by Law 1/2011, «existing volume means the gross volume already built or under construction or completed but not yet with a habitability certificate, or with the possibility to build under the current regulations». Therefore, any increase in volume is not allowed for both existing buildings as well as any building areas that have not yet expressed, in whole or in part, their intent to build.

2 Evaluation Issues Relating to the Housing Plan in Campania

Most of the initiatives allowed by the Regional Law cannot be carried out without ex ante evaluations on the cost effectiveness of the projects[7]. In fact, if the ordinary reasons that induce an owner to increase the volume of his home may relate to the direct use of the constructed volumes (for example, an extra room or an extension of the spaces available), any demolition, reconstruction and rehabilitation initiatives of degraded areas are mainly dictated by speculative aims. In these cases, it is necessary to evaluate the *highest and best use*[8] of the property in question, considering the valorisation of the different solutions, and identify the most profitable alternative. Thus, for example, for a building in ruins, the transformation value of the recuperated building[9] must be compared with the market value of the building obtained from the demolition and reconstruction with an 35% increase of the initial volume[10]. The rent value of a property with a production destination must be compared to the value obtained from the same market as a result of the conversion of the existing building[11]. The profitability value of the company in activity

[7] On the centrality of evaluation issues for the practical feasibility of the investment, see [13], [25], [27].

[8] «The *highest and best use* (HBU), which is the most convenient and best use, is the use that has the maximum transformation or market value of the planned uses for a property. The HBU therefore indicates a more profitable target. This can be the current one of the property if the market value (MVEU) is greater than the transformation values of the alternative uses. [...] The choice of the HBU refers to uses: physically and technically feasible (technical constraints); legally allowed (legally binding); financially viable (budget constraint); cost-effective (economic criterion)» [33]. «The most convenient and best use is defined as follows: The most likely, physically possible, appropriately justified, legally permissible and financially viable, use to induce the provision of a higher value of the object of evaluation» [2]. It is also worth referring to [5], [24].

[9] With any increase in volume, if permitted.

[10] «Notwithstanding the planning instruments in force, an increase, of up to a maximum of thirty five percent, of the volume of the existing residential building is allowed for the demolition and reconstruction, to be achieved within the existing building in which it is located, owned by the applicant», Law 1/2011, art. 5, co. 1. It is therefore worth noting that a series of measures aimed at cutting bureaucratic procedures in approving projects are currently being discussed, regardless of the Housing Plan. «The latest [...] is the transition from the field of building renovation of the interventions that need a permit to build [...] to the simplified, with the Scia (certified report of start of the work) being enough to start work without prior permission, and the local authority being able to intervene within 60 days. [...] Amendment to Article 10 of the Construction guidelines (Decree 380/2001) and will extend to the Scia tacit assent to the work that will lead "to a building organism in whole or in part different from the previous year and involving an increase in housing units, changes of volume, shape, or surface". This project is part of the so called "freedom of shape", which should extend to the demolition and reconstruction that can be rebuilt without necessarily having to meet the shape of the old demolished building» [15].

[11] «For abandoned buildings, notwithstanding the general town planning and building parameters, [...] reconstruction interventions with the same existing volume are allowed, even with a change of use, providing for the construction of no less than thirty per cent for social housing [...]. The volume resulting from the replacement housing may have the following destinations: housing, offices for no more than ten per cent, neighborhood stores, craftsmen's workshops. [...]», R.L. 1/2011, art. 7, co. 5.

must be compared to the sum of the income of the company outsourced to a suitable *landing area* and the transformation value of the *take-off area* destined for new functions[12].

The economic convenience of housing transformations allowed by the Housing Plan is significantly influenced by the volumetric consistencies bound to the social functions, especially those for *social housing*[13], as well as by their management methods[14]. In most cases, the Regional Law sets the rate to be reserved for social housing. In one case, however, states that the percentage is determined «in relation to the transformation value» of the area[15].

A further disciplinary note relates to article 11^{-a} of the new Regional Law 1/2011, concerning the relocation of residential units located in areas with a very high landslide risk as well as in the red zone at risk of eruption of Mt. Vesuvius. This article evidently refers to equalization issues[16]. In fact, it seems to be apodictic that the

[12] «For polluting industries or those that are not compatible with the surrounding residential activities, the replacement housing is allowed, subject to the prior relocation of the activity in the region, ensuring, with a suitable relocation plan, the increase of ten per cent in the following five years of current employment levels. [...]», R.L. 1/2011, art. 7, co. 5-a. For further details on the estimative aspects that the examples raise, see [6], [7], [8], [9], [11], [12], [14], [20], [34].

[13] Disciplinary references can be found in [32].

[14] Art. 1, co. 2 of Ministerial Decree 22.04.2008 states that «a social housing unit is defined as property used for residential use in a permanent location that acts as a general interest [...] to reduce the housing problems of individuals and families [...] who are not able to rent accommodation in the free market. […]». Co. 3 also provides that «the definition in paragraph 2 also includes the housing built or retrieved from public and private parties [...] for the temporary renting of at least eight years and also to the property». Art. 2 states that «the regions, in consultation with the regional Anci, define the requirements for admission and permanence in the social accommodation [...] the regions, in consultation with the regional Anci, set out the requirements to benefit from easier access to the property and establish procedures, criteria for the determination of the selling price specified in the agreement with the local authority [...]».

[15] «[…] the local authorities have to conclude the proceedings, even on a proposal from the owners, individuals or grouped in a consortium, with a measure to be taken [...] notwithstanding its planning instruments applicable to the areas where urban renewal and construction is subject to the disposal by the owners, individual or grouped in a consortium, and in relation to the transformation value of areas or properties to be allocated to social housing, in addition to the mandatory minimum provision of public spaces, or reserved for collective activities in public parks or carparks with reference to Ministerial Decree No. 1444/1968. [...]», R.L. 1/2011, art. 7, co. 2.

[16] Article 11-a: «1. In order to prevent the landslide risk or that of the eruption of Mt. Vesuvius and protect the safety of persons and the security of inhabited settlements, relocation should be encouraged within the same municipality, or other surrounding municipalities through an agreement between them, of buildings containing residential housing units in the areas classified by the Basin Authority as in danger or under very high landslide risk [...]. 2. The owners of buildings under the condition of danger or very high risk [...] can ask to carry out, outside of the same areas and in areas used for residential urban planning, an additional increase in volume, as well as those permitted on the basis of the current planning instrument, [...] equal to the volume of the housing unit assigned as the first house increased up to a maximum of thirty five percent [...]. 3. The applicant, however, shall, after concluding a special agreement, demolish the building and restore the environmental areas pertaining thereto as well as transfer the same to the unavailable patrimony of the town, prior to the conclusion of the construction the new building».

increase in the volume of the housing units built in an "safe" area («up to a maximum of thirty five percent») is devoid of any economic considerations on the different positional value of the *areas of landing* and *takeoff*[17].

Finally, it should be also pointed out that the application of the Regional Law on the property market could lead in the short run to a reduction in the selling prices, resulting in an increased supply of homes in response to the demand. This is a matter of no small importance in the current economic contingency.

3 Effects of the Housing Plan in Campania: The Field Survey

In order to quantify the effects that the Law 19/2009 of Campania is able to generate on the regional economy[18], a survey was carried out to verify the implementation of the aforementioned regulation at a local level. The geographical area covered by the study includes the fourteen municipalities that make up the vast area of the Agro-Nocerino-Sarnese (SA)[19].

The following data were collected from the Technical Offices of all the Local Councils:

1. Local Council Ordinance, with definition of the urban context subject to the Housing Plan[20] (article 4 co. 6 of R.L. 19/2009);
2. number of applications received pursuant to R.L.19/2009;
3. number of applications approved in accordance to R.L. 19/2009;

followed by:

4. classification of applications according to the article and paragraph of the Law which each type of intervention refers to.

Table 1 summarizes the results of the survey. Of the fourteen municipalities of the wide area, seven have issued a Council Ordinance. 367 applications were submitted in total.

Most of the applications (97) regard the change of use from rural to residential (art. 4 co. 7). This type of intervention is followed by that of a 20% volumetric increase (art. 4 co. 1), the demolition and reconstruction with an increase in volume (art. 5), recovery of attics (art. 8 co. 2) and, ultimately, the redevelopment of urban areas (article 7 form. 5). Figures 1 and 2 report the applications received in each municipality

[17] On the issue of urban equalization, see [3], [23], [24], [30].

[18] The study described was carried out between November and December 2010, about a year after the promulgation of the R.L. 19/2009 and before the enactment of the amendments made by R.L. 1/2011.

[19] The area known as Agro-Nocerino-Sarnese is located in the valley of the Sarno River, halfway between Naples and Salerno. The municipalities that are part of it (San Valentino Torio, San Marzano sul Sarno, Sarno, Pagani, Nocera Inferiore, Nocera Superiore, Castel San Giorgio, Siano, Bracigliano, Corbara, Angri, Sant'Egidio del Monte Albino, Roccapiemonte, Scafati) are all in the Province of Salerno, covering a total area of 158 km^2 and over 285,000 inhabitants, with a population density equal to 1,807 inhabitants/km^2.

[20] R.L. 19/2009 provides that within sixty days from the date of entry into force of the same, the local Councils could identify, by means of specific Council Ordinances, the areas to be excluded from the application of the law.

in relation respectively to the total number of applications in the Agro-Nocerino-Sarnese territory and the number of homes in the same municipality.

Upon data collection, none of the applications had been approved.

The study was supplemented by surveys, carried out in the five main cities of the province of Campania, which have made it possible to confirm the number of approved applications equal to 37% of those presented.

Table 1. Data collected from the Local Councils of the Agro-Nocerino-Sarnese

	Local Council Ordinance	change of use (art.4 co.7)	20% extension (art.4 co.1)	demolition and reconstruction (art.5)	requalification of degraded urban areas (art.7 co.5)	recovery of attics (art.8 co.2)	total applications
Angri	YES	15	27	33	1	77	**153**
Bracigliano	NO	0	1	1	0	0	**2**
Castel S. Giorgio	YES	2	5	6	0	0	**13**
Corbara	YES	0	1	2	3	0	**6**
Nocera Inf.	YES	45	26	9	1	0	**81**
Nocera Sup.	NO	0	0	0	0	0	**0**
Pagani	YES	2	1	2	1	0	**6**
Roccapiemonte	NO	0	0	0	0	0	**0**
S. Marzano S.	NO	3	1	0	0	0	**4**
S. Egidio M.A.	YES	1	7	8	6	4	**26**
S. Valentino T.	NO	3	2	0	0	0	**5**
Sarno	NO	13	12	16	0	0	**41**
Scafati	YES	13	11	6	0	0	**30**
Siano	NO	0	0	0	0	0	**0**
total		**97**	**94**	**83**	**12**	**81**	**367**

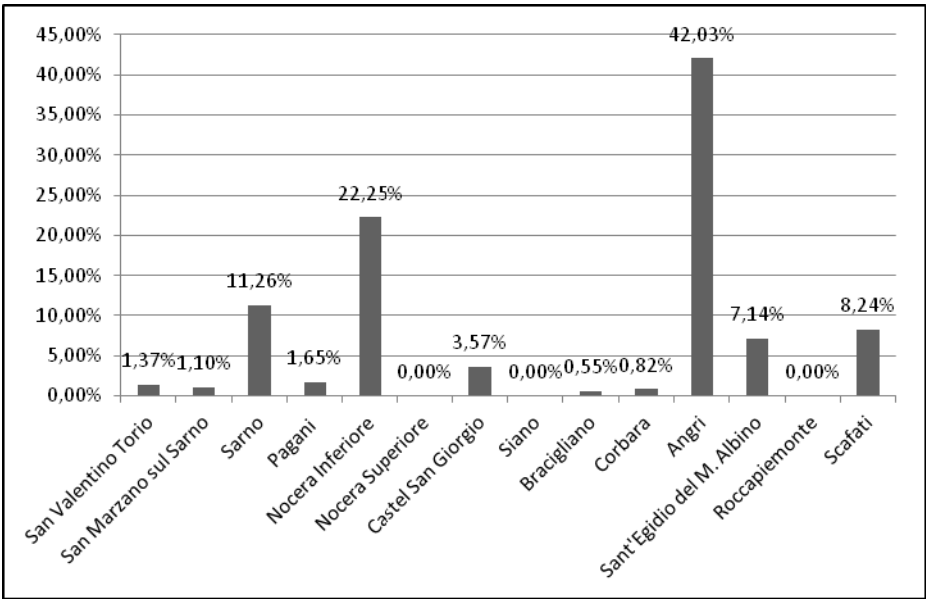

Fig. 1. Percentage of the applications presented, in relation to the total, per Council in the Agro-Nocerino-Sarnese

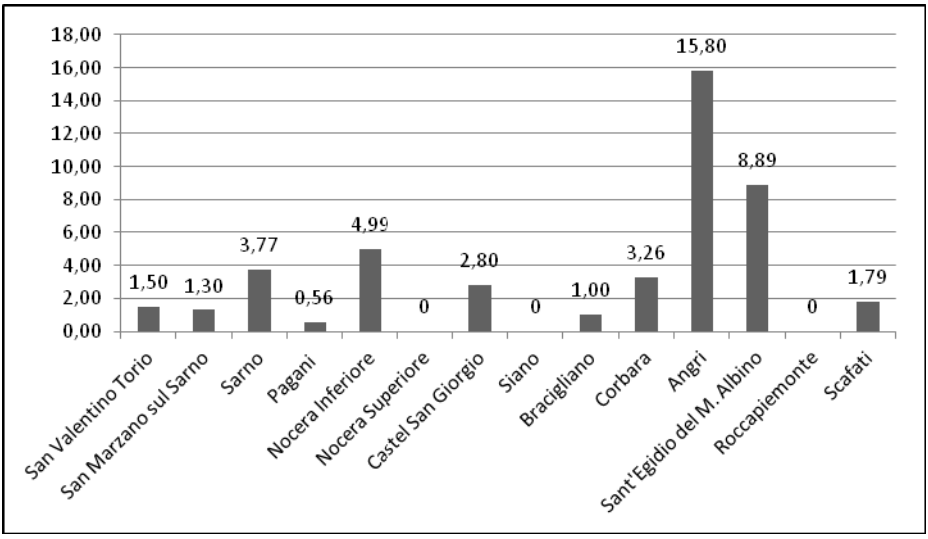

Fig. 2. Number of applications presented, in relation to the number of homes, per Council in the Agro-Nocerino-Sarnese (data multiplied by 10^3)

4 Estimation of the Effects of the Housing Plan on the Regional Economy of Campania

The sample is the starting point for predicting the economic effects of the Housing Plan Law in Campania. The computational tool is the inter-sectorial matrix. This makes it possible to determine the impacts (output) generated by a change in the aggregate demand (inputs, such as investment in the productive sector) on the economy of the territory where the matrix is associated[21].

The logic of the estimation is based on the assumption that every application has an associated implementation cost, i.e. the cost of the approved project. This spending generates an increase in investment in some sectors of aggregate demand (e.g., construction and professional activities), which in turn produces indirect effects on all the branches of the economy of a territory. Therefore, if it is possible to estimate the number of applications presented in Campania, based on the data found in the Agro-Nocerino-Sarnese, the sum of the costs of the interventions relating to the total number of applications is the *input* to identify the drag effect on the regional economy.

In this paper, the inter-sectorial matrix is the *Social Accounting Matrix* (SAM) of the Campania region, updated to 2010[22].

[21] The logic of the *input-output* system is structured in the inter-sectorial matrix, an accounting framework that synthesizes the flows arising from exchanges of goods and services that take place between the various productive sectors and between producers and end-use sectors. For further details, see [1], [17], [18], [19], [21].

[22] The preparation of the SAM Campania is a collaboration between the University of Rome Tor Vergata, Institute for Industrial Promotion (IPI) and the Ministry of Economic Development.

The implementation of the SAM Campania requires two preliminary steps:

1) estimation of the number of applications presented in the Region in accordance with R.L. 19/2009;

2) estimation of the costs of carrying out the works set out in the applications.

4.1 The Number of Applications in Campania

Since the Housing Plan Law has the main objective of increasing the number of homes, it is reasonable to assume that the number of applications in a defined geographical area depends largely on the number of houses in that area. Obviously omitting a number of other factors (population, income of the resident population, the prevailing building type, level of urbanization, social quality, educational level, presence of degraded areas, etc..) which are potentially influential on the number of appli cations presented in Campania, but in respect of which, to some extent, building density can be taken as a *proxy*. The estimate, therefore, is developed by weighting

TOTAL NUMBER OF APPLICATIONS IN CAMPANIA	9,018		
26.4%	2,381	art. 4 co. 7	change of use
25.6%	2,309	art. 4 co. 1	20% extension
22.6%	2,038	art. 5 co. 1	demolition and reconstruction of 35%
3.3%	298	art. 7 co. 5	requalification of abandoned areas
22.1%	1,993	art. 8 co. 2	recovery of attics

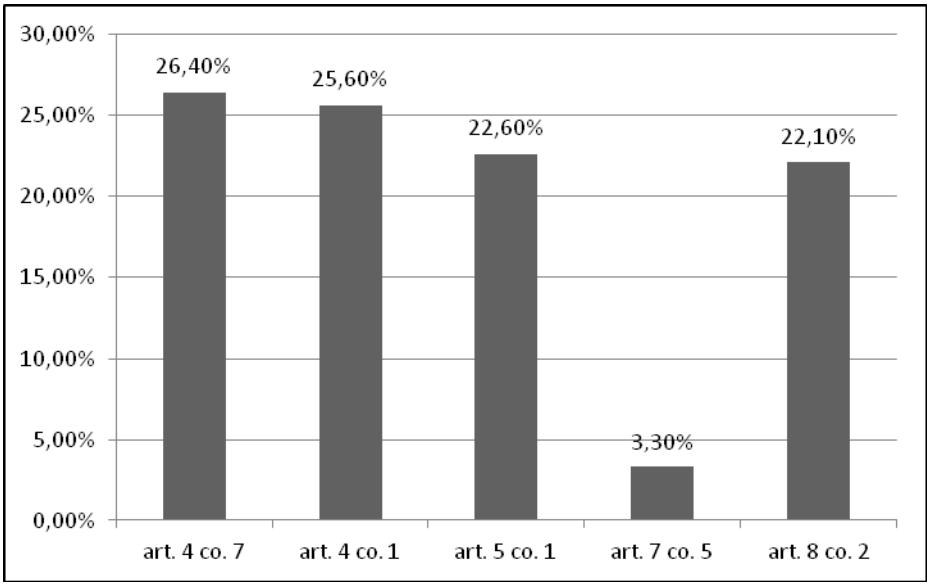

Fig. 3. Estimation of the number of applications presented in Campania and classification according to the Law

the number of applications presented in the Agro-Nocerino-Sarnese with the number of homes in the same territory. The assumed ratio is then extended to the entire region, with the patrimonial consistency being known. Since the year of assessment is 2011, from the calculations based on data from ISTAT relating to previous periods, there are, respectively, 105,725 housing units in the Agro-Nocerino-Sarnese and 2,598,039 in Campania. Taking into account that the number of applications in the Agro-Nocerino-Sarnes is 367, the probable number of applications presented in the region is equal to 9,018. In Figure 3, the estimated number is distributed among the intervention categories allowed by R.L. 19/2009, assuming that the percentage distribution coincides with that found in the study area.

4.2 Cost Analysis

The estimation of the costs for the implementation of the interventions described in the applications is developed by identifying an archetype for each of the project categories set out by R.L. 19/2009[23].

The total costs of these cases in relation to the most widespread building types and contexts in the Agro-Nocerino-Sarnese are quantified below[24].

20% volumetric Increase (art. 4 co. 1)

The typical case of a detached building with a volume of 700 m^3 is assumed. The application of article 4 comma 1 makes it possible to increase the volume by 20%, resulting in an overall cubic capacity of 840 m^3.

The total cost of the intervention is the sum of the construction costs, urbanisation costs and professional fees.

The construction costs are estimated by using a synthetic procedure, with reference to the prices indicated in [30]. Given that the unit cost of construction is 298 €/m^3, this results in:

$$\text{Construction costs} = €/m^3\ 298 \times m^3\ 140 = €\ 41{,}720\ .$$

The urbanization costs and professional fees are assessed as a percentage of construction cost, respectively 10% and 7%. Therefore:

$$\text{Urbanisation costs} = 10\% \times €\ 41{,}720 = €\ 4{,}172\ ;$$

$$\text{Professional fees} = 7\% \times €\ 41{,}720 = €\ 2{,}920\ .$$

[23] On the procedures for estimating the construction costs, see among others: [4], [10], [16], [22], [28].

[24] It is worth noting that the cases in relation to the categories "change of use" (art. 4 co. 7) and "recovery of attics" (art. 8 co. 2) are not associated. In fact, these categories do not usually involve significant changes in volume or work, so that the corresponding *total cost* is given only by the technical expenses for the protocol procedures and the approval of the practices. Expenditure for the purposes of this study, are negligible in terms of contribution to the *overall cost*, the latter understood as the product of the total cost and number of applications presented.

The total cost for the 20% volumetric increase is therefore equal to:

$$\text{Total cost} = € 41{,}720 + € 4{,}172 + € 2{,}920 = € 48{,}812 .$$

Demolition and Reconstruction (art. 5)

For this category, the typical case of a masonry building with a volume of 500 m^3 is considered. Under art. 5, it is possible to demolish the ruins and build a building in place with a volume increase of 35% compared to the existing building, so that the final volume is 675 m^3.

The total cost of the work includes the demolition costs, the fees for the disposal of the material, the construction costs of the new asset, the urbanization costs and professional fees.

The demolition costs and fees for the disposal of the material are based on [29]. The respective unit costs amount to € 15.24/m^3 (full vacuum) and 4.20 €/m^3 (actual volume of the material ≈ 130 m^3). Thus:

$$\text{Demolition costs} = €/m^3\ 15.24 \times m^3\ 500 = € 7{,}620 ;$$

$$\text{Waste material disposal fees} = €/m^3\ 4.20 \times m^3\ 130 = € 536 .$$

The construction costs are estimated by using a synthetic procedure, with reference to the prices indicated in [30]. Given that the unit cost of construction is 298 €/m^3, this results in:

$$\text{Construction costs} = €/m^3\ 298 \times m^3\ 675 = € 201{,}150 .$$

The urbanization costs and professional fees are assessed as a percentage of the sum of the demolition costs, the waste material disposal fees and the construction costs, which are respectively 10% and 7%:

$$\text{Urbanisation costs} = 10\% \times (€ 7{,}620 + € 536 + € 201{,}150) = € 20{,}931 ;$$

$$\text{Professional fees} = 7\% \times (€ 7{,}620 + € 536 + € 201{,}150) = € 14{,}651 .$$

Ultimately, the total cost for the demolition and reconstruction is:

$$\text{Total cost} = € 7{,}620 + € 536 + € 201{,}150 + € 20{,}931 + € 14{,}651 = € 244{,}888 .$$

Requalification of Degraded Urban Areas (art. 7, co. 5)

For owners of abandoned buildings, R.L. 19/2009 makes it possible to convert the entire volume of the area for residential, commercial or tertiary use. The conversion is permitted in compliance with the minimum planning standards set out by DM 1444/1968. The typical case is given by an area of 8,000 m^2 which includes industrial

factories with a volume of 24,000 m^3 (4,000 m^2 × 6 m in height)[25]. Within the constraints of Ministerial Decree 1444/1968, through the change of use, the result is a building complex of 15,000 m^3 (four tower buildings of 3,750 m^3 each) with 2,700 m^2 designed to urban standards[26] and 1,500 m^2 for parking[27]. Figure 4 shows how the space is distributed.

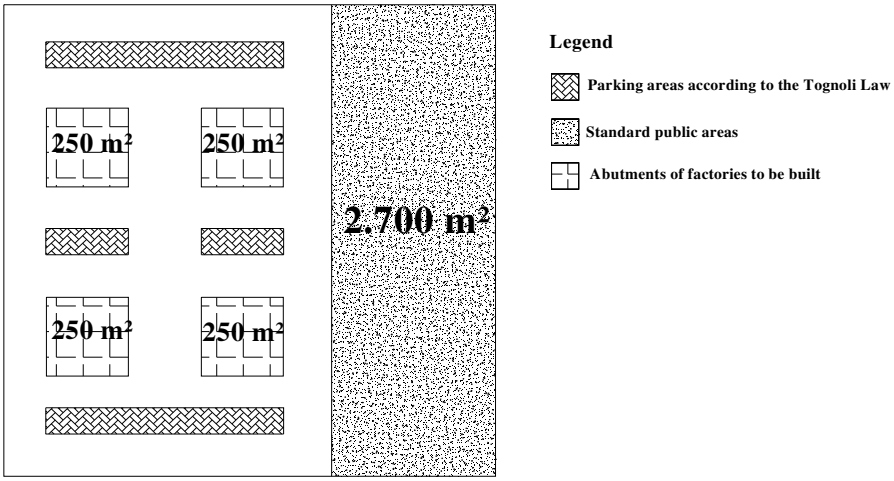

Fig. 4. Distribution of the areas in a typical case

[25] R.L. n. 14/1982 and s.m.i. (R.L. n. 7/1998 and R.L. 15/2005) provides that for new production facilities, "the coverage ratio, unless otherwise regulated by the Industrial Development Area Plans should be contained within the 1:2 ratio of the surface used for the production plant". It is worth noting that most of the currently disused factories in the Agro-Nocerino-Sarnese are characterized by a higher coverage ratio of 1:2, due to them being realized prior to the above mentioned law. In order to take into account the current state, in the typical case described, a 1:2 ratio between the area of the abutments of the assets and the land area (not land) of the lot is considered.

[26] Art. 3 of Ministerial Decree 1444/1968 states that the maximum ratio between the spaces allocated to residential and public spaces, or reserved for collective activities in public parks or parking lots "are set to such an extent as to ensure for each inhabitant, established or to be set up, the minimum imperative equipment, of 18 m^2 for public or reserved for collective activities in public parks or parking, with the exception of road space available for offices. [...] For the purposes of compliance with the aforementioned relationships in the training of planning instruments, it is assumed that, unless otherwise shown, for each inhabitant installed or set up there is an average of 25 m^2 of gross floor area (approximately 80 m^3 empty for full), plus possibly a share not exceeding 5 m^2 (approximately 20 m^3 for full vacuum) to destinations not specifically residential but closely associated with the residences (shops for basic needs, community services for homes, professional offices, etc.)".

[27] Art. 2 of Law 122/1989 (Law Tognoli) states that "in new buildings and also in areas belonging to the construction no less than one square metre for every ten cubic metres of the construction must be reserved for parking spaces".

The total cost is the sum of the demolition costs of the existing assets, the costs of disposing of the waste material, the construction costs of the new buildings, the cost to create outdoor areas of the new building complex, the urbanization costs and professional fees.

The demolition costs of the existing buildings and the disposal costs of the waste material are estimated according to [29]. From the respective unit costs, equivalent to € 13.08/m^3 (full vacuum) and € 15.76/m^3 (the actual volume of 3,500 m^3 of debris), thus resulting:

$$\text{Demolition costs} = €/m^3\ 13.08 \times m^3\ 24{,}000 = € 313{,}920;$$

$$\text{Waste material disposal fees} = €/m^3\ 15.76 \times m^3\ 3{,}500 = € 55{,}160.$$

The construction costs and the cost of creating external spaces are estimated with reference to the prices indicated in [30]. The unit construction cost of a tower building is 283 €/m^3, which gives:

$$\text{Construction costs} = €/m^3\ 283 \times m^3\ 15{,}000 = € 4{,}245{,}000.$$

The unit cost of creating external spaces is 43 €/m^2, thus:

$$\text{External spaces cost} = €/m^2\ 43 \times m^2\ [8{,}000 - 2{,}700 - (4 \times 250)] = € 184{,}900.$$

The urbanization costs and professional fees are respectively 10% and 6% of the sum of the demolition costs, the disposal costs, construction costs and the costs to create external spaces:

Urbanisation costs = 10% × (€ 313,920 + € 55,160 + € 4,245,000 + € 184,900) = € 479,898;

Professional fees = 6% × (€ 313,920 + € 55,160 + € 4,245,000 + € 184,900) = € 287,939.

For the typical case of the requalification of urban areas, the total cost is:

Total cost = € 313,920 + € 55,160 + € 4,245,000 + € 184,900 + € 479,898 + € 287,939 = € 5,566,817.

4.3 Implementation of the SAM Campania

Table 2 shows, for each intervention category, both the *total cost* given in paragraph. 3.2, as well as the *overall cost* as the product of the total cost and number of applications presented.

Table 2. Total cost and overall cost per intervention category

intervention category	total cost [€]	overall cost [€]
20% volumetric increase	48,812	112,694,872
demolition and reconstruction	244,888	499,125,791.10
requalification of degraded urban area	5,566,817	1,656,742,074

The *input* data required to activate the Social Accounting Matrix of Campania relate to the Construction and Professional Activity sectors. They are obtained from the overall cost by subtracting the expenditure items for professional fees. These data are reported in Table 3.

Table 3. Input data of the SAM Campania

intervention category	Construction [€]	Professional activity [€]
20% volumetric extension	105,952,444	6,742,428
demolition and reconstruction	469,263,564	29,862,227
requalification of degraded urban area	1,571,048,518	85,693,556
total	**2,146,264,526**	**122,298,211**

The implementation of the SAM Campania gives the effects on the regional economy generated by investments in the construction and professional activities sectors. The result is expressed synthetically using three indicators: change in regional GDP (ΔGDP = 2.889%), increase in employment (48,021 units of work) and monetized environmental damage (€ 214,904,024).

The *output* expresses the potential impact, over a period estimated to be between three and five years, that the Housing Plan would have on the regional economy if all the applications submitted were approved (optimistic scenario). It is reasonable to assume that this last condition can hardly be satisfied. From the data obtained from the provincial capitals, only 37% of the applications presented are approved. Thus, in addition to the optimistic scenario, it is also worth considering the realistic scenario that the percentage of approved applications in the Campania region coincides with the averages in the cities of Naples, Avellino, Benevento, Caserta and Salerno. In such a case, the *input* for the SAM Campania is the 37% of the optimistic scenario. The *outputs* indicate a 1.069% rise in the GDP, 17,768 new jobs and an environmental impact of € 79,514,788.

Table 4 summarizes the results.

Table 4. Output of the realistic and optimistic scenarios

	ΔGDP [%]	economic impact [M€]	employment [units of work]	environmental impact [€]
realistic scenario	1.069	5,269.08	17,768	79,514,606
optimistic scenario	2.889	14,240.76	48,021	214,904,340

5 Conclusions

This study, the results of which were submitted to the judgment of experts in thematic conferences, estimates the effects of the Housing Plan in Campania (R.L. 19/2009) on the regional economic system. It first discusses the objectives of the Law and the contents of the various articles. The evaluation issues are therefore analyzed, indicating the constant support function carried out by estimations in relation to public and private investment decisions.

The regulatory framework is the starting point for the field survey, which was carried out in numerous technical offices of local councils. The information obtained relates to the administrative and technical aspects of the process initiated by Law 19 and the subsequently approved applications.

Appreciation of the private financial resources that the regulation is able to mobilize is carried out with a synthetic procedure, based on unit costs derived from current literature and practices. The data are used as an *input* for the activation of the inter-sectorial matrix in Campania that makes it possible to predict the probable impacts on the regional economy generated by the implementation of construction projects that the Law contemplates. Two different scenarios are evaluated in the analysis: one optimistic, assuming that all the applications are approved by the local councils; one realistic, taking a percentage of unapproved applications. The results of the realistic scenario (economic impact on the production sectors of € 2975.80 million and 17,768 new jobs), compared with the forecasts made by ANCE[28] (effects on the economy, € 19 billion and 40,000 units of work) show that the objectives are, to date, only partially satisfied.

The application of the inter-sectorial matrix also make it possible to make eco-sustainable considerations of the effects of the Housing Plan, through the monetary quantification of environmental damage, for which appropriate mitigation tools should be expected.

The logic defined in the study – from the actual retrieval of data processing through an economic analysis methodology – represents a practical assessment which can be used in other regional contexts.

It is also worth highlighting the different responses given by the administrative authorities responsible for issuing approvals in the cities and the provinces. The data obtained from the surveys carried out in the provinces clearly highlight that no applications had been authorized at the time of the study. While, in the main cities 37% of

[28] See: www.edilportale.it

the applications had been approved. This shows the inconsistency of the regulatory measures aimed at deregulation, when they are particularly complex to interpret. The *expertise* available in the technical offices in the suburbs is often inadequate when having to assume any form of responsibility that comes from the loosening of legal constraints, resulting in the stalemate of the bureaucratic machine and the failure of any investment initiative. Finally, it deals with verifying the effectiveness of the regulation as amended by Law 1/11.

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