Seismic risk reduction: the opportunity of new incentives and the economic potential of interventions

Potential interventions aiming at reducing seismic risk supported by fiscal incentives, could theoretically trigger a total amount of investment ranging from 940 to 1,040 billion euro. This is one of the main findings of a recent Cresme estimate.

Strong exposition and vulnerability of the building stock

Italy is a country with a high seismic risk due to medium-high seismic danger, to very high vulnerability and exposition. Nevertheless, if compared to the rest of the world, the seismic risk on Italian territory is not the highest. In fact, it can be considered as medium-high within the Mediterranean area and modest compared to other areas of the planet (e.g. Indonesia or America's Pacific coastline).

However, in terms of economic and social consequences, the relatively high seismic risk is associated to a certain level of vulnerability of the building stock and high housing density as well. Thus, when compared to other countries, Italy emerges as extremely vulnerable, as the ratio between damages recorded and energy released by the seismic events appears to be very high. For example, the earthquake in Umbria and Marche regions in 1997 caused damages (about 10 billion Euro and 32,000 persons evacuated) similar to those caused by the 1989 Loma Prieta earthquake (San Francisco Bay, California), estimated in 12.3 billion euro, despite its intensity was 30 times lower.

Around 6.1 million buildings are located in territories characterized by higher seismic risk (zones 1 and 2 of national classification) ,of which 5.1 million are residential. Sicily, Campania, Calabria and Lazio are the regions with the highest number of buildings in risky areas (1.5 million in Sicily, of which 1.3 residential; 924,000 in Campania, of which 783,000 residential; 748,000 in Calabria, of which 610,000; and Lazio, with 531,000, of which 450,000 residential).

Since the 70's, Italy has progressively introduced a technical regulation aimed to increase anti-seismic planning/design of new buildings. Notwithstanding, up to now it is estimated that only 5% of existing buildings have been built according to modern standards.

The opportunity of the so called "sisma-bonus"

The Law Decree n. 63 of 4th June 2013, so called Sisma-bonus, has introduced a special fiscal deduction of 65% of expenses for preventive works and intervention for seismic improvements and compliance measures of existing buildings. These regulations have been extended by the next Stability Laws. They are, however, an example of contingent measures, i.e. with a limited and restricted timeframe (that is, one year). For this reasons, these measures have not been applied in a systematic way. Under this aspect, the Sismabonus envisaged by the Stability Law 2017 (232/2016) introduced an important innovation. The timeframe within which it is possible to undertake the interventions was extended, allowing a long term planning and the possibility to introduce a system that quantifies the seismic risk of buildings and the benefits gained through the interventions. This planning activity represents a guarantee of efficiency of the investments, concerning the seismic safety and the expected economic benefits. It also represents the condition for the fiscal measures to be effective. That is a real incentive for investments and for the whole economy, reducing the general seismic risk and the earthquake's overall costs.

The Stability Law 2017 has changed the measures of the Law Decree 63/2013 (sc. Sismabonus) envisaging its implementation according to the classification of seismic risk of the buildings. The principal novelties introduced concerning the fiscal deduction for expensed for anti-seismic interventions are the following:

- High fiscal deduction is envisaged for interventions reducing the seismic risk, according to the guide lines for the classification of seismic risk for buildings
- The timeframe for the tax relief is extended up to 31 December 2021;
- The possibility of the fiscal reduction is implemented in seismic zones 1, 2, and 3 (thus including also zones with minor risk, which were previously excluded by the regulation)
- Incentives are relevant for residential buildings (not only, as previously envisaged, for that used as principal residence) and for buildings for productive activities
- The fiscal credit can be spread for a period of 5 years
- Expenses for the seismic classification and for the building check are covered by the fiscal deduction
- The credit tax transfer is admitted not only for construction firms, but also for third parties (private persons and excluding credit institutions) but only for interventions on common parts of condominiums.

The admitted deduction rates are applicable as follows:

- 50% deduction for anti- seismic measures.

The deduction may significantly be increased when the fulfilment of interventions leads to a reduction of seismic risk enabling the shift to a lower class of risk: More specifically, the fiscal deduction increases to:

- 70% for reducing the risk by one class
- 80% for reducing the risk by two classes.

When the interventions have been realized on common parts of condominiums, fiscal deduction further increases:

- 75%, for a reduction by one risk class
- 85%, for a reduction by two risk classes.

The deduction may be applied to expenses amounting to less than 96,000 Euro multiplied by the number of units in the building, and spread by 5 annual equal shares.

Furthermore, measures have been introduced to sustain the building substitution, i.e. interventions undertaken trough demolition and reconstruction. The benefits are relevant for buildings located in "risk zone 1" municipalities, where works for reducing the seismic vulnerability are carried out through demolition and reconstruction of the whole building by construction companies or real estate refurbishment companies). Under these conditions, a deduction on the purchase price for the buyer of a single real estate unit of the re-built building is envisaged, as reported on the public act of purchase, as follows:

- 75% for interventions determining the passage to one risk class lower
- 85% for intervention determining the passage to two risk classes lower

Alternatively, the possibility for the buyer to opt for the fiscal credit transfer is envisaged, corresponding to the amount of the fiscal deduction.

Estimation of the potential investment stimulation by the public incentives

The new fiscal deduction scheme is very appealing. The high rate of fiscal deduction, the fiscal credit transfer, the timeframe for spreading the fiscal saving, in connection with the relevant number of buildings in seismic zones and their vulnerability, all together represent an important opportunity for interventions on the existing stock.

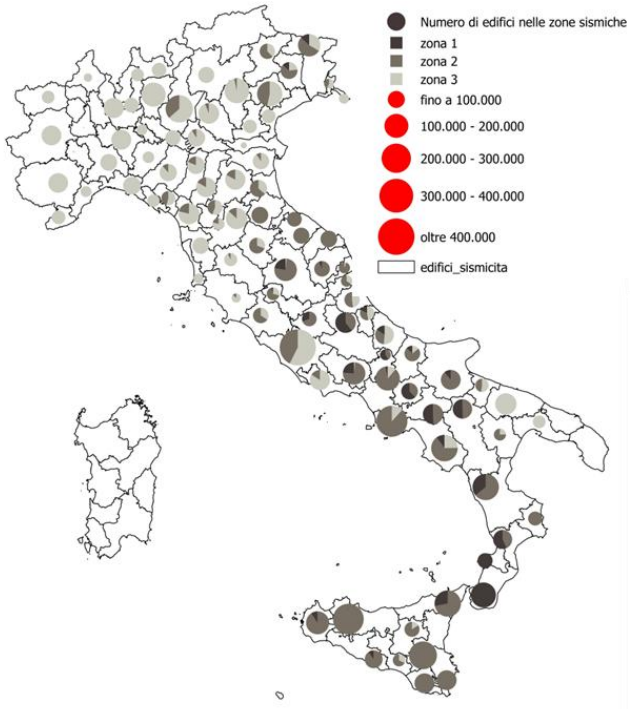
All in all, 11 million buildings are located in risk zones 1, 2 and 3 of which 9.3 millions are residential. 20.4 million households are actually living in occupied dwellings. The total number of dwellings located in these zones amount to 21.3 million and surface area for productive buildings amounts to about 800 million sqm.

The estimation of potential investment to be activated by the interventions is based on the following methodology:

- The levels of seismic vulnerability of these buildings were differentiated based on the following variables:
  - Age of the building
  - Condition (state of maintaining)
  - Construction materials used, cladding and load-bearing structure
- The average cost for intervention has been calculated considering the level of vulnerability and the options of possible interventions (elastic insulators, reinforced external thermal covering), ascribing different costs to the different building typologies. Also the cost for diagnostics, planning and supervision of works were considered.
- Also the urban context is covered (old town, villages, isolated houses, etc.) and the share of contiguity in the buildings.

To conclude, the sum of potentially activated resources for safety measures of buildings located in zone 1, 2, and 3 ranges from 940 to 1,040 billion Euro. Theoretically, in southern regions, at least 53% of total amount should be activated, in central regions the share would be around 24%.

Chart 1:



Source: CRESME/SI elaboration on data from Istat, Ispra, Protezione Civile

Table 1: Main data in the risky zones by level of danger

	high	medium	low	Not relevant
	Zone 1	Zone 2	Zone 3	Zone 4
Land surface (km2)	26.907	105.958	99.112	69.351
Number of municipalities	705	2.202	2.882	2.258
Population	2.878.326	19.368.078	25.949.127	12.600.081
Households	1.179.818	7.751.530	11.443.222	5.441.741
Buildings	1.127.663	4.976.257	4.976.073	3.372.687
Residential buildings	914.795	4.198.244	4.204.195	2.870.464

Source: CRESME/SI estimation on data coming from Istat, Ispra, Protezione Civile.

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