UNDERWRITING OF DERIVATIVE INSTRUMENTS IN LOCAL AUTHORITIES IN ITALY: OPPORTUNITIES AND CRITICAL ISSUES

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Summary

Over the last twenty years in Italy, Local Authorities have walked new financial sustainability by finding alternative resources to cover their current and non-current expenses.

This is due, on the one hand, to their greater financial autonomy and, on the other, to the increasing decrease in funding received from the Central Government.

The use of derivative instruments (Interest Rate Swaps) reached significant quantitative levels in the past years. Subsequently, the new legislative framework introduced a more restrictive regulatory regime until the current impossibility for local authorities to subscribe to derivative instruments.

The erroneous use of derivatives, which aggravated the risks associated with the debt to be incurred, and their failure to be used as part of proper debt management (liability management), led to this change in orientation.

The cognitive and informative research was conducted by consulting print and digital sources. The most significant literature was extracted from the most accredited citation databases (Scopus, ISI/WOS, etc.).

During the research, the author also took on the information in an experiential nature from his professional activity.

It was thus possible to ascertain that most of the swap contracts entered into by Local Authorities with their chosen banking intermediaries were no longer aimed at hedging against the risk of interest rate fluctuations, but turned into dangerous speculative transactions.

The Public Administration, lacking adequate expertise, was unable to correctly assess or otherwise the degree of "cost-effectiveness" of the signed contract.

Keywords: *Local Authorities, Banks, Liability Management, Interest Rate Swap (IRS), Swap, Over the Counter (OTC), Up Front.*

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1. Introduction. The study examines the use of the derivative financial instruments by the Local Authorities (Regions, Provinces, Municipalities, Local Health Authorities, Hospitals, etc.) in the last fifteen years in Italy.

The progressive recognition to the Local Authorities of a high degree of financial autonomy over the years has led to the necessity of finding new external resources for the financing of the expenses, both of the current part and the investments.

Moreover, the lack of economic resources allocated by the Central Government has led Local Authorities to embark on new paths of financial sustainability by activating other financing channels, to make up for the growing cuts in resources in the face of dilation of durable expenditure.

In this context and the face of the growing needs coming from the socio-economic fabric of the territories, the Local Authorities have sought margins of flexibility, firstly by taking out loans and issuing bonds after the elimination of the constraint of recourse to the Cassa Depositi e Prestiti (C.d.P.) and, later, by taking the path that, initially, seemed very attractive, of the derivatives.

The recourse to these instruments by the Local Authorities (in particular, *swaps* on interest rates and "structured" instruments) has reached significant levels over the years. The questions inherent in the use of derivative financial instruments by the Local Authorities are part of the broader theme of the "active management of the debt" (*liability management*), which, in general, results in being, until now, little examined.

Using, in various ways, these instruments, the Local Authorities have put into effect operations that have influenced the risks connected to the indebtedness, to its effective amount, and, in the last analysis, to the finding of resources to employ in the ordinary management.

The aim of the study is to highlight, on the one hand, the discrepancy between the complexity of the derivatives used and, on the other, the low level of technical *expertise* of almost all managers of the economic-financial sectors of Local Authorities.

The financial managers must possess a high level of *expertise* to evaluate the actual and real risk (implicit) in the derivative contract and to follow the trend of its value. Derivative transactions are very different from taking out a loan or issuing bonds. The value of derivatives varies continuously over time and, therefore, when negative trends appear, good practice would dictate that derivative contracts be balanced with as many of the opposite signs to eliminate or reduce the risk. On the other hand, the concept of "active debt management" means precisely following these dynamics, which, among other things, requires time that is not always available and advanced skills, all elements that are difficult to find in Public Administrations (Borgonovi, 2019).

Moreover, when the so-called 'derivatives bubble' deflagrated, its most immediate consequence was a series of lawsuits brought by Local Authorities against banks.

The speculative bubble of the derivatives manifested itself long after the adhesion to interesting (at least in the short term) contractual proposals coming from the banks, which had allowed those in charge of the financial sectors of the Local

Authorities to preserve their budgets without reducing services to the community. In reality, the final long-term effect was to transfer balance sheet rigidity and accrued losses on previously concluded derivative contracts into the future.

The huge number of disputes between Public Administrations and banks has been progressively reduced as the banks have preferred to settle disputes relating to contracts in their favour with settlement agreements. However, these settlements included a "confidentiality clause" which committed the Local Authorities not to disclose the agreements entered into, thus preventing other Public Administrations from taking the same legal route and blocking the proliferation of further legal actions (Borgonovi, 2019).

2. Purpose of research. The study examines the utilization by the Local Authorities of the derivative financial instruments in Italy in a time of circa fifteen years until the Italian legislation confirmed the prohibition for the Public Administrations to stipulate new derivative contracts.

The main objective of the research is to verify the modalities and the results of the underwriting of derivatives by Local Authorities in the preceding years.

The research questions are:

Q_1 Did the Local Authorities correctly assess the degree of "economic convenience" of the operation?

Q_2 Have Local Authorities correctly accounted for derivatives in their income statements and balance sheets?

The hypotheses are as follows:

H_1 the behaviour of Local Authorities in the management of derivatives in the case of assumptions of early extinction, renegotiation, or early termination;

H_2 the consequences for Local Authorities for the continued use of *upfront* as financing.

The study proposes to sensitize the scientific community so that further areas of research can progress and develop, both of a theoretical and empirical nature, concerning certain themes of great interest such as:

- the level of competence matured within the Local Authorities and of the Public Administrations in general, in the underwriting of derivative contracts;
- the manoeuvrings' space of the Local Authorities within the present normative framework that limits the recourse to derivatives;
- the possible implications on the system of the national accounts relative to the probable increase of interest rates in the coming years;
- the provision of alternative financial instruments suitable to provide margins of flexibility to the Local Authorities and which also ensure a greater containment of risks.

3. Literature review. The bibliography consulted refers to national and international literature that has mainly examined the topics of public finance, active debt management policies and derivative contracts entered into by Public Administrations.

The statistical data, for the analysis of the european framework, was taken from EUROSTAT ("Reporting of Government Deficits and Debt Levels") and, for the analysis of the national framework, from the Ministry of Economy and Finance - Department of the Treasury Directorate II - Office IVA ("Monitoring Activities on Derivative Instruments") and from the Central Institute of Statistics (ISTAT).

4. Research methodology. The author carried out cognitive-informative research aimed at deepening and critically analysing the subject matter of the study with bibliographic material. In particular, the author consulted written sources on both paper (books, journals, library works, etc.) and digital media (internet, digital magazines, etc.).

This study proposes several critical considerations, assessing the latest scientific developments on the topics under consideration and reviewing the best national and international bibliography. This work also has an interdisciplinary value because it examines technical, general economic, business, managerial and regulatory aspects.

The author used the most popular citation databases such as Scopus, ISI/WOS, etc. for the literature review. The collection and critical review of published scientific proposals also derive from unpublished insights from direct observation and/or practical experience. The author, in support of the research, has taken data and information of an experiential nature from his professional activity as a chartered accountant. In fact, as a technical consultant, he has assisted the Italian Courts in disputes concerning the use of derivative instruments that have pitted banks against private commercial companies.

The various different topics are ideally divided into two sections.
In the first part, reference is made *(i)* to the "active" management of the debt by the Public Administrations, *(ii)* to the quantitative dimension reached by the derivative financial instruments underwritten by the Public Administrations, and, finally, *(iii)* to the most frequent typologies of IRS underwritten by the Local Administrations.

In the second part, the work examined the orientation manifested by the Public Administrations both in the correct evaluation of the degree of "economic convenience" of the operation and in accounting for the financial flows of the derivatives in the economic-equity statements, also in light of the hypotheses of renegotiation or early withdrawal by the Local Authority. Particular attention has been paid also to the current practice tied to the concession of the *upfront* by the financial intermediary and the interpretation and evaluation by the Local Authorities of the *Mark to Market* (MtM).

In light of the above, the article adopts a qualitative methodology to offer a systematic literature review of the complex and sometimes-distorted use of derivative instruments by Local Authorities in Italy.

5. Main results. In the preceding pages, reference has already been made to the innovative approach of Public Administrations to their debt positions (*liability management* technique).

Borrowing techniques typically used by private companies that operate on both sections, active and passive, of their balance sheets, public bodies and corporations have also begun to approach such models in order to optimise their debt performance. They have become 'active' and no longer 'passive' entities that, from the observation of the different components that characterise their debt stock, derive useful elements to more adequately balance their economic-financial structure (Amatucci, Vecchi, 2010 and Meneguzzo, 2003).

Derivative instruments have taken on significant importance in active debt management as their *performance* varies concerning the results obtained from the underlying asset, which can be financial or real.

Public administrations have mainly used the swap instrument, which has allowed - when used prudently and correctly - a better spread of interest rate or exchange rate fluctuation risk that could not be achieved with traditional financial instruments (Meneguzzo, 2003).

Looking briefly at liability management, it is defined as the process by which a Public Authority tends to reduce its level of risk as market conditions and fluctuations change and optimise the cost of its debt in order to maintain the financial equilibrium of management.

In extreme synthesis, the technique of *liability management* is divided into two main phases (Amatucci, 2010):

a) the analysis and diagnosis of the Entity's financial position in the course of which the risk profile to which it is exposed is defined;

b) the development of specific strategies to manage its stock of liabilities to market fluctuations. In this phase, the Entity *(i)* develops its strategy for managing its portfolio of liabilities through the most appropriate use of derivative financial instruments; *(ii)* defines and refines the intervention to be undertaken, and *(iii)* constantly monitors its position in light of the intervention undertaken.

About the quantitative dimension assumed by the derivative financial instruments underwritten in Italy by the Public Administrations, the following is presented (Source: Elaboration on data from Department of Treasury, "monitoring activities" as of 31.3.2017).

It is premised that the data reported has been elaborated up to the first quarter of 2017, since the values after this period have assumed a scarce relevance, given the impossibility of the Local Administrations to stipulate new derivative contracts.

The block to the stipulation of new operations on derivatives, starting from the second half of 2008, has led to a progressive decrease in the operations in derivatives by the Local Authorities. This decreasing trend was caused not only by the natural extinction of many contracts that had reached maturity but also by the continuous early extinctions of the positions assumed by the Local Administrations in the medium-long term.

In particular, concerning the monitoring activity carried out on 31.3.2017 (data updated to 4.4.2017) by the Treasury Department, it can be deduced that the type of Administration that has stipulated the major part of the contracts (notional values for

a total of circa 6 billion Euros) is represented by the Regions and Autonomous Provinces with a percentage of circa 49% of the total notional value, followed by the Municipalities with circa 34% of the notional value (in absolute value circa 4,2 billion Euros).

Regarding the type of Institution, 178 Local Administrations were surveyed that had underwritten derivatives contracts as of 31.3.2017. Of these, the non-Capital Municipalities represent (109) 61,24% of the total, followed by the Capital Municipalities (28), the Provinces (26), and almost all the Regions (15 out of 20 regions).

Finally, Municipalities that are not capital cities are also the Administrations that have signed the largest number of contracts (149), while Regions, Provinces, and Capital Cities, as of 31 March 2017, have significantly fewer contracts.

Regarding terminated derivative contracts, the peak was reached in 2010 with 276 terminations, with a steady decrease until 2016, when 12 terminations were recorded. The highest number of contracts that reached natural maturity (29) was concentrated in 2015 and in the last year of data collection (2016), those that expired amounted to 16.

In general, since 2008, the year in which the prohibition on signing new derivative contracts for Public Administrations was introduced, the number of extinguished and expired contracts amounted, up to 31.12.2016, to 1.026 corresponding to approximately euros 20,3 billion of initial notional value.

From the reconstruction of the historical series of the derivative contracts in force on the 31st December of each year, starting from the year 1997, it is possible to note that the maximum dimension of the phenomenon was reached in the year 2007 when 796 Administrations (Regions, Provinces, Municipalities and non-Capital Municipalities) had underwritten 1.331 derivative contracts. From that year until 31.12.2016, the trend, with reference both to the number of Administrations and to the number of contracts underwritten, has been constantly decreasing.

At this point, the most frequent types of derivatives underwritten by Local Authorities are examined.

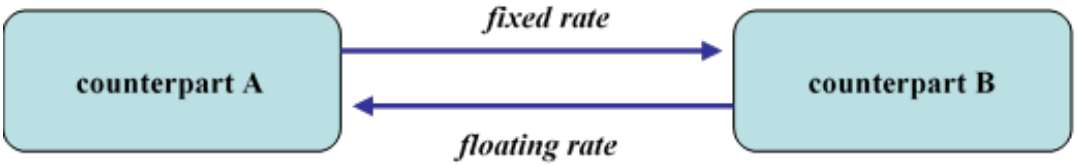
The transactions concerned *swaps*, at most linked to *collar* (*cap* and *floor*) transactions that tempered the risk of the floating rate above or below certain barriers.

We will therefore briefly analyse the *swap* contract, an instrument that is not present on regulated markets but is traded only on the unregulated one also called *Over the Counter* (OTC): consequently, an operator who intends to stipulate such a derivative must turn to a bank or an authorised investment firm.

In its broadest sense, a *swap* can be defined as a contract whereby the parties agree to exchange two sums of money calculated by applying different parameters (interest rates, exchange rate of a currency, stock indices) to an identical reference amount. This amount, which is called the notional capital, is not transferred at any time during the contract. In more detail, a *swap* can be defined as a contract between two counterparties who agree to exchange cash flows for a certain period, based on

an agreement in which the timing and method of determining the cash flows are established.

The most common *swap* contract is the *Interest Rate Swap* (IRS) that, in its most basic form, is the *plain vanilla swap* (IFA Consulting, Assofinance, 2011). It consists of an agreement whereby two counterparties agree to exchange an interest stream calculated on a notional capital for a fixed period, equal to the duration of the *swap*, at identified intervals. As a result, one party will make payments calculated based on a fixed-rate, while the other party will make payments at variable-rates "pegged" to the same notional capital, as shown in **Figure 1**:

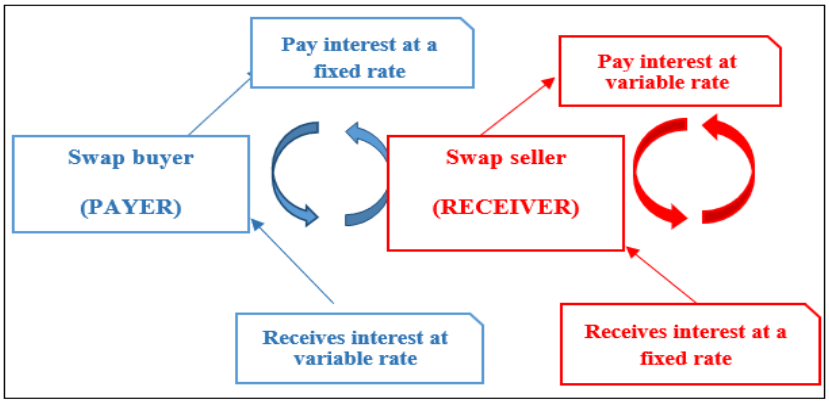


Source: Marcelli (2010)

Figure 1. **Example of *plain vanilla* IRS**

In practice, party A) pays to party B) a stream of capital calculated concerning a contractually defined fixed interest rate and receives a stream of capital calculated regarding a given variable rate (*i.e.* EURIBOR). Party B) pays streams calculated about EURIBOR to receive in return streams calculated on the same capital but regarding the fixed interest rate. The exchange of the capital flows must take place on a differential basis: this means that, at each maturity date, if the floating interest rate, *i.e.* EURIBOR, is higher than the fixed interest rate, party B) must pay to party A) the difference between the floating interest rate and the fixed interest rate calculated on the reference capital.

On the contrary, if at every single maturity the opposite occurs, *i.e.* the fixed rate is higher than the EURIBOR, party A) will have to pay to party B) the difference between the two rates, always calculated on the notional reference (Marcelli, 2010). In particular, the *buyer swap* (*payer*), committing himself to pay a fixed rate and receive a variable rate, remains exposed to an unforeseen decrease in the interest rates. Conversely, the *swap seller* (*receiver*), by committing to pay parameterised interest at a floating rate, is exposed to an increase in interest rates (Polimeni, 2015) (**Figure 2**):



Source: Polimeni (2015)

Figure 2. **Operation of a *plain vanilla* IRS**

One of the major problems that manifested itself in the course of the operative practice concerned the incorrect use of the derivatives by the Local Authorities, which often, due to the limited knowledge of the products, underwrote IRS *no par* at the stipulation of the contract.

This condition of imbalance was manifested when at the date of subscription the value of the derivative was negative for the Local Authority, which, assuming a greater risk than the counterparty, collected a sum of money by way of an *upfront* payment to re-establish the condition of financial equity (*par*) of the contract. This, on the contrary, always had to assume a zero value for both parties at the time of signing. The *upfront* received in this way, which represented a true 'implicit' financing, generated 'additional' liquidity that was misused by the Local Authority to cover current expenses. (IFA Consulting, Assofinance, 2011).

Another relevant discriminating factor for Local Authorities was whether the derivative being underwritten belonged to the *plain vanilla* type that incorporated moderate risk. In reality, the regulatory sources themselves used expressions that left a considerable margin of uncertainty as to which transactions were to be considered *plain vanilla*. This denomination differed from the traditional meaning attributed to these swaps by financial technique.

There was a real possibility that in the IRS underwritten as *plain vanilla*, there were instead "digital" options characterized by undoubted elements of risk (Consob, 2012).

The guidance provided by the Authorities (MEF Circular, 2014) allowed the possibility of entering into *Interest Rate Swaps*, *forward rate agreements* (which is a contract that allows one to invest or borrow at a future date at a *forward* rate, in order to preserve the financial investment from future changes in interest rates), interest rate *cap* and *collar*.

In practice, the banks, however, starting from the elementary derivative IRS *plain vanilla*, were able to create and then propose to the unsuspecting Local Authorities, an unlimited series of financial instruments frequently denominated, due

to their singularity and complexity, “exotic”. Hence the various names found in the literature such as derivatives, instruments, or “exotic” products (Marcelli, 2012).

In reality, the Local Authorities were allowed to subscribe (provided they were able to recognise them) only to IRS with associated *cap* options (not also the *floor* option), acting as buyers (and not sellers) of *cap* or *collar* (Di Carlo, 2003).

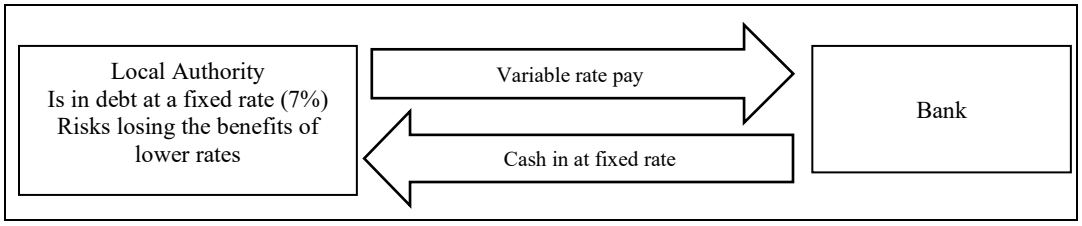
In the final part of the study, the concepts of “economic convenience”, “renegotiation”, “early termination”, “*Mark to Market* (MtM)”, and “*upfront*” are briefly analysed.

Concerning the evaluation of the economic convenience in the underwriting of a *plain vanilla* IRS by a Local Authority, the following example is proposed.

One supposes that a Local Authority, to restructure its liabilities (for example, a loan taken out with a C.d.P. at the fixed rate of 7%), decides to stipulate a *plain vanilla swap* with a credit institution at a fixed rate of 7%. The objective of the Local Authority is to link the fixed rate mortgage (7%) to an indexation parameter such as EURIBOR, increased by a *spread* (5,50%) which will constitute the real cost of the mortgage. The bank is the counterparty guaranteeing the payment of the fixed rate (7%) against the variable rate. Both parties, therefore, have both interests payable and interests receivable and will only make payment to the counterparty if the interest receivable is lower than the interest payable (differential). At each semi-annual maturity date (called *settlement* or *refixing date*), if the variable EURIBOR rate, increased by the *spread*, is lower than the fixed-rate, the Local Authority will obtain an advantage given by the differential; vice versa, the bank will obtain the economic benefits.

According to the hypotheses of the exchange of flows between fixed-rate and variable-rate, indicated in **Table 1** below, in the first and second years, the values are to the advantage of the Local Authority, which will obtain a positive flow. In the third year, the values are identical and there will be no exchange of flows. In the following years, instead, there is an increase in the EURIBOR and, in this case, the Local Authority will have to bear the cost of the differential to the advantage of the credit institution.

Table 1. **Example of a *plain vanilla* IRS entered into by a Local Authority**



Years	Bank to Institution	Euribor + *spread* 5,50%	Institution to Bank	Balance
1	7,0%	0,5% + 5,50%	6,0%	+ 1,0%
2	7,0%	1,0% + 5,50%	6,5%	+ 0,5%
3	7,0%	1,5% + 5,50%	7,0%	0,0%
4	7,0%	2,0% + 5,50%	7,5%	-0,5%
5	7,0%	2,5% + 5,50%	8,0%	-1,0%

Source: Amatucci, Rispoli (2019)

In the example just analysed, a possible strategy of transforming the stock of debt with fixed rates above market rates was highlighted, changing the rate from fixed to variable and obtaining advantages in terms of cost reduction (Marconi, 1999 and Finetti, Marconi, 2001).

The derivative instrument, like any financial product, has its market value: the redemption or replacement value is generally referred to as the *Mark to Marke*t (MtM) (value of the contract at a certain date). This value (which may be positive or negative) is determined based on some variables, such as:

- the cash flows still to be collected or paid by the Local Authority;
- the *swap* rate curve
- the volatility of the options included in the contract.

Being linked to these parameters, the value of the MtM varies daily according to market movements. Therefore, it is important to underline that a negative value of the MtM today will not necessarily transform itself into an effective monetary disbursement for the Local Authority unless it decides to avail itself of the faculty of early repayment at that moment. Even in the presence of a negative market value, the structure may continue to generate positive differential flows, if the actual trend of future rates does not correspond to the expectations implicit in the curve. In essence, the MtM, if it is negative and the *swap* is not terminated, has the nature of a potential future loss. Its possible negative value, therefore, should be matched in the accounts by a provision for risks, to assure the Local Authority a capacity to face the higher charges that could appear in the future.

Precisely because of the high volatility of the value of the instrument, it is foreseen the possibility for the Local Administrations to proceed to the early withdrawal or the renegotiation of the contract. In both cases, as well as at the time of the stipulation, the operation must be financially neutral, that is, the sum of the current values of the cash flows of the two counterparties must be zero, so as not to disadvantage either party.

Moreover, in the transactions carried out, it is frequent to recognise the so-called initial *upfront*, *i.e.* a "premium" in favour of the Local Authority, received at the time of the conclusion of the contract and generally proportional to the notional capital.

In a context characterised by *(i)* the reduction of transfers from Central Government to peripheral Administrations, *(ii)* the rules of the Internal Stability Pact that have introduced further rigidity to budgets, and *(iii)* the simultaneous growth in

demand for services and public works, Local Authorities have adopted improper behaviour in the accounting management of derivatives in order to maintain their spending autonomy.

6. Discussion and conclusions. The study examined the use of the derivative instruments by the Italian Local Authorities in the past years, at least until 2017. The huge underwriting of derivatives is the result of a concomitant series of elements that have manifested themselves in Italy in a certain historical period. In fact, due to the reduction of the financial resources allocated by the Central Government, the Local Administrations have had to diversify their traditional sources of financing to balance the increase of public expenditure to be destined to their territories and communities.

However, the phenomenon described is not exclusively Italian. In many European countries, the use of derivative instruments has grown significantly in coincidence with the financial crisis of the last twenty years. Analysing what has happened in the public sector, the Central and Local Governments have underwritten operations in derivatives, above all, at the beginning of bond financing. The most frequent operation was the *plain vanilla swap*, with the transformation of the debt from a variable rate to fixed rate, prevalently in the operations of bond refinancing.

In many cases, however, the operations were set up in exactly the opposite way: expecting a reduction in rates, many Local Governments instead transformed their debt from fixed to variable, obtaining significant savings, especially in the first years of the operation.

The sudden rise in variable-rates around 2004-2008 led to considerable financial losses for the Local Authorities that had carried out operations of transformation from fixed to variable-rates. The same is true for the following years (2009-2015) for Local Authorities that had opted for the fixed-rate, when the reduction in rates, mainly due to the financial crisis, made their operations totally out of the market.

Even the possibility of withdrawing from ongoing operations has proved difficult for many entities, and in any case only feasible with the payment of high penalties.

Looking at the foreign experience, some aspects common to all countries emerge. A first element concerns the exposure to the risks of rates: the *swaps* carried out by the State and Local Governments have shown high levels of risk, above all, due to the lack of options able to limit the effects. Only in a few operations have *cap* or *floor* "barriers" been used to mitigate financial exposure, avoiding heavy repercussions on the Treasury.

The main data compiled by national (ISTAT, 2014) and European (EUROSTAT, 2015) statistical institutes concerning Italy about other European countries, are as follows.

In 2013, Italy had, to a notional value of approximately 168.000 million euro, a negative MtM of 29.400 million euro, equal to approximately 17.50% of the notional value.

In 2014, on a total notional value of the derivatives portfolio of 163.000 million euro, there was a negative MtM of 42.650 million euro, equal to approximately 26.00% of the notional value.

These figures, compared with the historical MtM figures recorded in other European countries, represented the worst performance in the Euro Area.

Concerning annual data on derivatives transactions by individual country, until 2013, Italy's negative MtM expressed in absolute terms was the highest in the Euro Area; almost double that of Germany. In relative terms to Gross Domestic Product (GDP), Italy recorded negative figures that were always on the rise until 2012. Higher values were recorded only by Greece and slightly lower values were reported in Germany and Portugal.

Besides problems of an exogenous nature, the derivative operations in Italy have also suffered from endogenous situations. There has not always been regular and correct use of the derivatives by the Local Authorities:

1) in particular, the IRS has been used as an instrument to generate "additional" liquidity to transform into normal financing.

2) This "additional" liquidity was determined by the underwriting of IRS *no par* at the time of their stipulation. This condition of imbalance provides that, at that date, the initial value of the derivative is negative for the Local Authority. The latter assumes a greater risk than the counterparty and for this reason collects a sum of money (*upfront*) which represents implicit financing. The *upfront* restores the condition of financial equity (*par*) of the contract, which, now of its signature, must always assume a zero value for both parties.

3) The Local Authorities have not always stipulated the most elementary contract of IRS (*plain vanilla swap*) and this circumstance has created numerous problems.

Further elements that have represented limits to the correct use of the instruments of derivative finance should be noted. In particular:

1) the managers of the financial sectors of the Local Authorities did not have adequate knowledge to carry out such complex financial operations. They did not have a specific preparation and competence to verify whether the IRS contained hidden "digital" or "option" components that made these instruments highly risky.

2) Faced with these difficulties, Local Authorities were forced to turn to a banking or financial intermediary (*advisor*).

3) This choice amplified the risks of the operation because the *advisor* assumed directly or indirectly the position of the counterparty with which the Local Authority stipulated the contract. This condition generated a dangerous situation of conflict of interest.

In conclusion, it can be said that the hypotheses have not been confirmed to the questions to which the research intended to provide answers.

Q_1) The Local Authorities had to be able to evaluate the "economic convenience" of the underwritten derivative, calculating its market value. The value of extinction or substitution, called *Mark to Market* (MtM), represents the value of the contract at a

certain date. The MtM (which may be positive or negative) is determined as a function of certain variables such as:

- the cash flows still to be collected or paid by the Local Authority;
- the *swap* rate curve;
- the volatility of the options provided in the contract.

H_1) The incorrect evaluation of the MtM of the derivative has often impeded the Local Authorities to avoid a probable loss insofar as they have not resorted to the early extinction of the derivative or have not proceeded to the early withdrawal or to a renegotiation of the contract to obtain better conditions.

Q_2) Local authorities have often not understood how the *swap* contract works.

Instead of being used as a form of hedging against the risk of interest rate fluctuations, the IRS was wrongly used as a normal loan. This misuse also led to a misallocation in the Local Authority's budget of the swap, which was booked as current revenue to cover current expenditure.

H_2) The consequence of this accounting interpretation was the use of the *upfront* received to cover current expenses.

This misuse led to accounting mismatches that manifested themselves in subsequent years when flows became unfavourable for Local Authorities.

This situation generated an even higher level of debt with higher interest rates than before the *swap* was signed.

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