**Italian Municipal Investment Spending and Urban Sprawl**

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**Introduction**

In Italy, the debate over urban sprawl and its negative impacts on environment is growing, notwithstanding the considerable slowdown of construction activity in municipalities since post 2008 crisis. Aggregate data indicate that also in recession times soil consumption in Italian municipalities never stopped (see for example Piedmont Region: Env. Report 2015). Legal provisions attribute to municipalities the main responsibilities in urban planning, and local fragmentation could be one of the drivers of increasing, unplanned, soil consumption.

Municipal finance could be affected by sprawl in many ways. Cost of public infrastructure, and other city services, could be higher, coeteris paribus, in more dispersed urban patterns. Private and social costs of sprawl (see Brueckner, 2000) entail commuting costs and environmental damages (pollution), mispricing of social value of open spaces. Italian literature examining the impact of urban sprawl on local finances (and the impact of local decision to spend and tax on sprawl) is scarce. Urban Planning scholars attribute many adverse consequence to urban sprawl, but empirical estimates of the impact of urban sprawl on Italian municipal local spending are rare, except for valuable contribution in European and US urban economics literature. Our empirical analysis is undertaken using a cross-sectional dataset of Italian municipalities, analyzing the relationship between sprawl and local costs, in particular infrastructure costs.

**Municipal regulation of urban development and local finance**

The "urban development paradox" points out the relevance of negative externalities created by suboptimal regulation of sprawl, but urban sprawl has implications for local finances. As shown in figure 1, the number and extension of new residential dwellings in 2000-2005 has grown faster than population. Since population growth is one of the most important determinant of new constructions from the demand side, we can assume that urban development trends have been

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uncoupled from population demand impulses. Other drivers, such as the level of interest rates and real estate markets trends, could have been the critical factors beyond demand push. At the local level, soil use regulations (applied by local councils) had to be "easy-going", making it easier for investors and household to build new dwellings inside municipal boundaries.

**Fig 1:** *Population, number of new residential dwellings and inner floor space (in square meters) in Italy 1995-2014 (1995=100)*

![Graph showing population, number of new residential dwellings, and inner floor space in square meters in Italy from 1995 to 2014.](image)

**Source:** *Authors calculation on national statistical office data*

Municipal governments collect revenues from urban development activity and renovating, called Building Permit Fees. Different rates are applied according to the type of building (residential and non residential), the type of construction activity (new building or renovation) and the local regulatory framework (urban planning regulations and zoning). Different rates are applied for the so called "contribution to the construction cost" and "contribution to the infrastructure cost". Revenues from this base has been increasing, and in 2007 the weight of building permit revenues on total municipal investment expenditures reached 18%.
Since 2007, this quota declined, due to changing balance budget rules and economic downturn. Central government allowed municipal councils to cover part of current expenses with building permit proceeds, reducing capital expenditures quotas covered by this type of revenue. Housing sector crisis and declining municipal investments could explain the ensuing volatility of the indicator in figure 2 since 2007.

Urban development in Italian municipalities entails two different type of infrastructure spending, the first due to waste, sewerage and roads infrastructures, and the second to direct services to the population like kindergarten, other public schools, transport and other facilities.

We do not present here the effective weight of revenues from building permit fees on this type of investment spending, not even the quota determined by new residential and non residential construction activity in each municipality, but we could gain some insight into the inadequacy of local resources coming from this type of tax base looking at building permit rates applied by a small sample of Italian municipalities in Turin province (approximately 11% of total municipalities in Turin province).

**Tab 1:** Permit fees in €/mq in a sample of 35 municipalities in Turin province and regional tariff, 2015

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<thead>
<tr>
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<th>actual average (35 municipalities*)</th>
<th>regional tariff</th>
<th>weight in %</th>
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<tbody>
<tr>
<td>residential buildings</td>
<td>new</td>
<td>27,18</td>
<td>56,55</td>
</tr>
<tr>
<td></td>
<td>renovation</td>
<td>14,76</td>
<td>31,65</td>
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</tbody>
</table>

*Municipal balance sheet data on Building Permit Fees are gross revenues, comprising fines. They do not show separate accounts for revenues stemming from infrastructure contribution fees.*
<table>
<thead>
<tr>
<th>non residential buildings</th>
<th>new</th>
<th>9,16</th>
<th>22,77</th>
</tr>
</thead>
<tbody>
<tr>
<td>renovation</td>
<td>7,74</td>
<td>18,21</td>
<td>42,5%</td>
</tr>
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Residential and non residential buildings permit rates applied by municipalities are on average below 50% of regional suggested rates. Given that also regional suggested rates are only a small quota of the effective cost per square meter of local infrastructure, the adequacy of this type of revenues with respect to infrastructure costs could be open to doubt.

Our empirical exercise, aimed at investigating the impact of urban sprawl on local infrastructure spending, seems of the utmost importance in the light of anecdotal evidence provided so far. Design of local policies to regulate soil consumption and building permit rates reforms at municipal level could benefit from an empirical assessment of the effect of sprawl on investment spending.

**Thumbnail description of the model and data**

Our paper examines the impact of urban sprawl on municipal capital expenditures in a sample of Italian municipalities exploiting on a new dataset containing indicator of urban dispersion based on high resolution maps, created by ISPRA (Italian National Institute for Environmental Protection and Research). In recent literature (see for example, Hortas-Rico & Solé-Ollé 2010, Hortas-Rico 2013) the econometric estimates derived from expenditure equations try to disentangle the impact of sprawling using low density urban development indicators, but their impact is difficult to separate from the impact of other potentially confounding effects. Recent empirical literature on the topic is mainly concerned with impact on current side of municipal budget, and results confirm a positive impact of urban sprawl on per capita expenditures (see Hortas-Rico et al. cited 2010).

But different morphological urban patterns are compatible with similar value of density values, hence econometric estimates could suffer from specification errors. This is especially true in our highly fragmented municipal system, characterized by heterogeneous orographic features and changing landscape.

Besides that, heterogeneity in morphological urban patterns could affect differently investment spending, due to specific economies/diseconomies of scale, increased distribution and density effects on infrastructure per capita costs.

To our knowledge, this is one of the first attempts to test econometrically the relationship between urban sprawl and public infrastructure cost at local level in our country using sprawl indicators (based on GIS data) which takes into account different morphological patterns of urban development in a cross section of Italian municipalities.
A discussion on the overall relations between local municipal financing and soil consumption closes our work. Interaction between local government budget decisions and urban sprawl is an heavily contested argument, and additional insight into the full fiscal consequences of increased scattered urban development could be beneficial for the enlargement of empirical literature on this topic.

References
To be added

Appendix
To be added