NATIONAL TARGETS VS. LOCAL ACTIONS: ANALYZING ITALIAN MUNICIPALITIES' CHILDCARE PROVISION CHOICES WITH A SAMPLE-SELECTION-CORRECTED CLASSIFICATION MODEL[1]

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Abstract. In decentralized countries, policies designed at the central level are frequently assigned to local governments for implementation. The central government sets the targets to be achieved and provides the funding, while local governments can decide whether, and to what extent, they participate in these programs. A recently launched program in Italy in the field of childcare follows this general framework. The central government allocated additional grants to municipalities, earmarked for the enhancement of nursery services, consistent with a national target. Individual municipalities utilized these funds to varying extents. This paper aims to investigate the key determinants of the choices made by different municipalities. We employ a sample-corrected model to account for the fact that only a set of municipalities received additional resources. The estimation process shows that demand-side factors and technological factors are the most relevant in explaining the different choices made by municipalities. The results suggest that the program design should be better tailored to the specific characteristics of the local environment to implement a more gradual activation of childcare services.

1. Introduction

In the 2002 at the Barcelona summit (Barcelona, 2002), the European Council set two critical goals for childcare services: ensuring access to early childhood education for at least 33% of children aged 3-36 months and 90% of children aged 3–6 years. These policy objectives aim to achieve two primary outcomes: promoting socio-economic development and fostering cognitive growth in children. From a socio-economic perspective, an extensive body of literature explores the relationship between childcare availability and maternal employment. Recent studies such as Morrissey (2017), and Zimmert (2023), offer compelling analyses of the impact of childcare provision on female employment, consistently demonstrating that expanding access to early childhood services yields substantial benefits, particularly by increasing female labour force participation. On the other hands, numerous studies in the

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paediatric field emphasize the significant cognitive and psychological advantages for children who attend kindergarten or early childhood programs (Archana V. Hegde and Averett, 2014; Landry et al., 2014, among others).

In federalist-type countries, the implementation of such services often reflects the decentralized nature of governance. Centrally designed policies - the central government sets targets and provides funding - are executed at the local level, allowing local governments to adapt policy design and implementation to their specific contexts (Aiello, *et al*. 2019). This dynamic can manifest either through delegation, where local authorities are mandated to implement centrally designed policies, or through discretion, allowing them to decide whether to participate in national programs via public calls. In the latter scenario, challenges such as low administrative efficiency at the local level or varying fiscal priorities across jurisdictions can undermine the central government's ability to achieve its targets effectively. This interplay between central goals and local execution can influence the effectiveness of public policies, especially for early childhood education initiatives, including their impact on developmental outcomes for children. In this article, we focus on the Italian context, where in 2022 the central government allocated additional grants to municipalities of both Ordinary Statute Regions and Special Status Regions such as Sardinia and Sicily, specifically earmarked for the improvement of nursery services, in line with a centrally established national target. The Italian program facilitates the transfer of funding to municipalities to cover current expenditures for expanding nursery places, while also leveraging the Recovery and Resilience Facility to support infrastructure investments in new nursery schools. It aims to guarantee a minimum level of childcare services both public and private, across the entire country. This is achieved through the establishment of *service objectives*, measured in terms of standard costs. The target requires each municipality to provide enough nursery places to achieve a coverage rate of at least 33% of resident children aged 3-36 months by 2027. To strengthen childcare services, the program targets municipalities where coverage falls below this 33% threshold, focusing on increasing public supply also considering the contributions of private providers. For these local authorities, the program calculates the additional number of nursery places required to close the gap between the current service level and the 33% coverage target. This approach aims to ensure that all territories can meet the established childcare service objectives. The threshold allows for the identification of municipalities that have not met the minimum coverage rate and are thus eligible to access funding as *beneficiaries*. Municipalities that have already reached the 33% target are classified as *non-beneficiaries*. Within the first group, municipalities are further categorized as *active* or *inactive*. *Active* municipalities have either met or surpassed the target, while *inactive* municipalities have failed to achieve the required service level. The binary classification of municipalities as *active* or *inactive* will serve as the target variable in analysing the determinants of the choices influencing the likelihood of achieving the

target and utilizing central government funds. Based on these results, this analysis may provide recommendations on how to revise the design of the measure. The resources allocated for kindergartens will contribute to maintaining the service level of 33% of the target population and covering the current expenditure needed to increase nursery places (in parallel with the Recovery and Resilience Facility for infrastructure investments in new nursery schools). Starting from 2022, increasing resources have been allocated, from € 120 million reaching up to € 1.1 billion by 2027. These funds will bridge the gap between the nursery places available in the reference year (2018) and those required to achieve the final target of a 33% coverage rate by 2027, calculated at the standard cost of €7,670 per new place. Figure 1 provides an overview of the different levels of nursery service coverage in 2018. In general, the coverage was higher in the Northern Italy, in Tuscany, and in the metropolitan area of Rome, while it was very low in Southern Italy averaging roughly to 13%. This evidence highlights a backwardness of the provision of nursery service, which has negative consequences on the social and economic structure of Southern Italy. Although it would be challenging to investigate why, for example, Apulia region had a coverage rate that was on average higher (the regional average is about 24%) than the rest of Southern Italy, the map represents only the starting point—understood as the *status quo*—of our analysis. Instead, we aim to shed light on the current situation, how municipalities have worked to bridge the gap in terms of childcare service coverage, and what factors may have played a role in this public policy activity. To support the most disadvantaged areas, resources allocated for the 2022–2026 period are reserved for municipalities with historical service coverage below 28.88% of the target population. Furthermore, during this period, the allocation of funds considers the presence of unused places in municipal nurseries. This strategy aims to accelerate progress toward the target level in municipalities that already possess the required infrastructure and can promptly begin operations with the additional management funds. Municipalities may use the allocated resources in various ways, such as directly managing public nurseries, forming unions of municipalities, entering agreements with private nurseries, or providing vouchers to families for childcare services. The use of allocated funds is closely monitored: municipalities must report annually to the central government on the additional nursery places provided, ensuring consistency with the assigned targets. Each municipality is required to certify the achievement of its goals by completing the SOGEI[2] Reporting Questionnaire (SRQ, available on the Open Civitas website[3]). Municipalities that are not beneficiaries of the service enhancement funds are also required to complete the form for the sections related to monitoring services in their territory.

[2] SOGEI Spa is an *in-house* company owned by the Italian Ministry of Economics and Finance.
[3] www.opencivitas.it

This article is organized as follows: in Section 2 we provide a quantitative analysis of the program along with a regression modeling strategy to infer the likelihood of achieving assigned coverage targets, in Section 3 the results are discussed, Section 4 highlights key discussion points and the conclusion.

Figure 1 - *Nursery places coverage in 2018 (%). Lighter to darker shades from 0% to exceeding 33% of coverage in nursery services.*

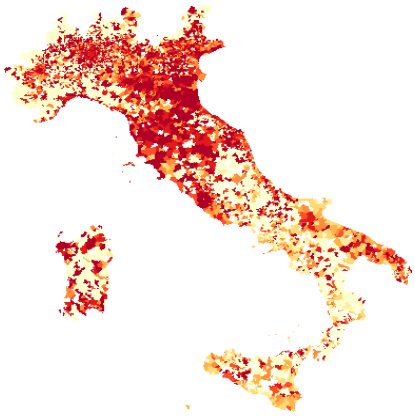

Figure 2 - *Beneficiaries and non-beneficiaries of the measure: non–beneficiaries in yellow, the beneficiaries in green.*

2. The nursery services measure

According to the measure presented in Section 1, municipalities can be identified as *beneficiaries*, if they did not achieve their own target and entered the program, or *non-beneficiaries* if they had already satisfied the required level of service. A significant number of *non-beneficiaries* are in Northern Italy, as illustrated in Figure 2. The geographical distribution clearly shows that these municipalities are predominantly concentrated around Emilia-Romagna region. This dynamic is undoubtedly shaped by distinct and significant territorial and socio-economic factors. The municipalities that do not benefit from the policy represent 32.2% of the total. For the remaining *beneficiaries*, the ratio between the additional users served (labelled as R28 in the SRQ) and the users assigned by the measure (target coverage, labelled as R27 in the SRQ) was calculated. This allowed for a distinction between *inactive* and *active* municipalities, where the former includes non-responding municipalities that failed to complete the monitoring form, those that failed to meet their target with a target coverage equal to 0%, or those that partially failed to meet their target with a target coverage less than 100%, while the latter includes municipalities that achieved

their target with a target coverage equal to 100% or exceeded their target with a target coverage greater than 100%. Excluding *non-beneficiary* municipalities, the expansion of services was pursued in a highly heterogeneous manner across territories, with responses varying significantly from region to region.

Table 1 - *Beneficiaries vs Non beneficiaries: Statistics on the number of nursery places and assigned resources*[4].

					Target		Outcome	
			Number	%	# nursery places	Assigned additional resources	# nursery places	Additional resources actually used
Non-Benef. municipalities			2359	32.2 %	0	0.00	0	0.00
Benef. municipalities	*Inactive*	Non responding	653	8.9 %	1686	12.9	507	1.5
		Failed target	2023	27.6 %	4125	31.7	0	0.00
		Partially failed target	247	3.4 %	2169	16.6	888	6.8
	Active	Achieved target	753	10.3 %	1886	14.5	1886	14.5
		Over achieved target	1295	17.7 %	5773	44.3	27697	44.3
Total			7330	100 %	15639	120.0	30977	67.0

Table 1 provides details of the framework between *beneficiaries* and *non-beneficiaries*. With specific reference to 2022, the allocation of resources under the regulations (€ 120 million) aimed to increase the total number of daycare centre users by 15.639. The monitoring data relating to the first-year implementation of the measure (2022) gives clear evidence about the variability in the extent to which individual municipalities have used the additional funds: the result is a marked

[4] Our dataset covers 7330 municipalities, based on the questionnaires of objective service for nursery care: 6562 municipalities for ordinary statute Region (OSRs) and 768 municipalities for Sardinia e Sicily (SSRs).

deviation in the increase of provided nursery places compared to what was centrally planned. However, the partial utilization of these resources (€ 67 million, 55.8% of the total for 2022) resulted in an actual increase of 30.977 additional users. Achieving or exceeding the target would instead appear to have a positive correlation with the demographic size of the entity. The initial service coverage rate, i.e., the *status quo* of the 2018 baseline year, appears to be strongly correlated with the activity or inactivity of municipal authorities. Among the municipalities benefiting from the resources, those with an initial absence or near-absence of nursery services showed no increase. Conversely, higher initial coverage rates were associated with greater municipal activity, as also already highlighted by Figure 1.

1.1. Data modeling

The variables we considered in our modeling strategy represent both the demand and supply-sides of nursery services, in addition to contextual variables that control for the geographical and socio-economic heterogeneity of Italian municipalities. Data sources include the Italian National Institute of Statistics (ISTAT), the Ministry of Economy and Finance (MEF), the National Institute of Social Security (INPS), and SOGEI questionnaires regarding municipalities' standard needs. Exogenous demand-side variables include the *average income* (in thousands of Euros) by municipality, which is expected to positively correlate with higher service demand, thus increasing pressure on local governments to meet service objectives. Additionally, the share of the *foreign population* and *retirees* are considered. On the other hand, the share of *unemployed females* is expected to place less pressure on local governments to fulfill service objectives compared to the aforementioned variables, reflecting the hypothesis that unemployed mothers may refrain from enrolling their children in nursery services to minimize associated costs. Lastly, the percentage of the *unmarried population* (aged 25 to 54) is considered as another factor with comparatively lighter pressure on local governments. On the supply side of service provision, several municipal-level economic and financial covariates were included to capture the health and stability of public finances, such as the *average financial rating index* from 2016 to 2019. This index ranges from 1, indicating a poor financial health status of the municipality, to 5, indicating excellent financial health status. The *average current balance index* from 2016 to 2019 provides insights into the municipality's financial balance, the higher the index, the better the municipality's financial health. *Cash advances* act as a predictor of financial distress, the higher the cash advances, the worse the municipality's cash position. Additionally, two dummy variables account for municipalities' participation in tenders aimed at constructing or renovating nurseries through NRRP (National

Recovery and Resilience Program) funding. A dummy variable capturing a *threshold effect*, i.e., fewer than six infants served in kindergartens, was included to control for the dynamic whereby municipalities with low nursery enrolment levels have less incentive to meet service objectives. Finally, the context variables allow us to control for the effects of morphological and other socio-economic aspects of the municipalities. These context variables are summarized through a clustering procedure that estimates the number of clusters and provides the probabilities of membership (the so-called *a-priori* probabilities) for each identified cluster. One of the aims of this analysis is to evaluate, using a probability measure within a frequentist context, the key determinants that most significantly affect the level of achievement of the service target. To achieve this, we categorized our statistical units (i.e., municipalities) into two groups, *active* or *inactive*, based on the level of service objective achievement as previously defined, and assigned a label of 0 to *inactive* units and 1 to *active* units. The most appropriate model for estimating the probability of belonging to one group or other falls within the class of supervised classification models for binary outcome. Furthermore, since we are dealing with a sub-sample (i.e., the *beneficiaries*), ruling out the municipalities that have not an assigned objective service, our analysis may suffer for a sample-selection bias that would provide inconsistent estimates. Since the work of Heckman (1979), the issue of sample selection bias has been extensively studied in the literature (among others, Wooldridge, 1995, Marra and Wyszynski, 2016, Baltagi *et al*., 2023, Lim *et al*., 2024). In our analysis, we adopt a Heckman-type correction, in the fashion of Marra and Radice (2013), which provides for a double simultaneous estimation procedure, the first one to correct for the potential bias, the second one as the model of interest, and a *t*-copula to model the correlation between the two equations, as in equation (1) and (2)

$$\widetilde{\boldsymbol{Y}}_{\boldsymbol{1}} = \mathbf{Z}\boldsymbol{\gamma} + \boldsymbol{\varepsilon}_{\boldsymbol{1}}, \boldsymbol{Y}_{\boldsymbol{1}} = \mathbf{1}\ \boldsymbol{if}\ \widetilde{\boldsymbol{Y}}_{\boldsymbol{1}} > \mathbf{0} \tag{1}$$

$$\widetilde{\boldsymbol{Y}}_{\boldsymbol{2}} = \mathbf{X}\boldsymbol{\beta} + \boldsymbol{\varepsilon}_{\boldsymbol{2}}, \boldsymbol{Y}_{\boldsymbol{2}} = \mathbf{1}\ \boldsymbol{if}\ \widetilde{\boldsymbol{Y}}_{\boldsymbol{2}} > \mathbf{0} \tag{2}$$

with $(\boldsymbol{\varepsilon}_{\boldsymbol{1}}, \boldsymbol{\varepsilon}_{\boldsymbol{2}}) \sim \boldsymbol{t}_{\boldsymbol{v}}(\boldsymbol{\theta})$, where Z and X are the design matrices for the selection and outcome equations, respectively, and $\boldsymbol{\gamma}$ and $\boldsymbol{\beta}$ are the corresponding vectors of unknown parameters.

3. Results

The *selection* model allows us to consider a correction for sample-selection bias. It shows good performance in capturing the selection mechanism to be *beneficiary*. At this stage, we guess that the selection process is governed by the *status-quo*, i.e., the percentage level of the service in the 2018, and to inherent characteristics of the

municipalities, such as the *average income* and geographical and context variable. As expected, the *status-quo* has a negative impact on *z-scores* meaning that higher service levels ensure that the municipality already close to the 33% target, making it highly likely that no additional service target will be assigned to it. This result aligns with our initial assumption that the status-quo significantly influences the probability of being a *beneficiary*. Moreover, consistent with expectations, the estimated coefficient associated with the *average income* has a positive sign. This could be due to two main factors: on the one hand, municipalities in wealthier areas might be more likely to have already met the service targets, benefiting from higher and better service levels; on the other hand, there is a strong demand component that makes municipalities more dynamic in fulfilling their tasks, also in terms of accountability and transparency between local governments and residents. Then, we make use of a composite indicator of migration flows defined as,

$$I *_{mf} = I_n * (population_m / population_r)$$

where I_n is the net balance of inter-regional migration, weighted by the ratio between municipal and regional populations. The index assigns a share of regional migration flows to each municipality according to its population within the *j-th* region. In addition, we include the *i-th* municipal population itself to control for the size effect of larger cities on the probability of being beneficiaries, and to properly disentangle the effect of the index from that of population size. The estimated coefficients are consistent with the interpretation that the higher the index, the lower the probability of being a beneficiary. Details on the estimation are reported in Table 2.

Table 2 - *Estimated coefficients of the selection model.*

	Estimate	Std.error	z-value	$\mathbb{P}(>\|z\|)$
Intercept	3.9805	.2613	15.23	<.000***
R2201 (*status quo*)	-.2098	.0077	-27.09	<.000***
Average income	.0539	.0124	4.35	<.000***
Migration flow Index	-.0676	.0322	-2.10	.036**
Municipal Population	.0022	.0004	5.16	<.000***

In the *outcome* equation we consider variables that capture both demand and supply-side factors, along with the a-posteriori probabilities of belonging to a cluster. Focusing on the demand-side explanatory variables, *Average income*, *% Female unemployment*, *birth rate*, and *% aged 25 to 54 unmarried* exhibit statistically significant impacts on the likelihood of being *active*, albeit with differing magnitudes and signs.

The first variable (*Average income*) has a positive impact on the target variable, suggesting that in wealthier areas, local governments tend to be more conscientious in fulfilling their commitments. Moreover, the demand power associated with *Average income* acts as a constraint for local authorities to perform effectively. On the other hand, the latter two variables have negative effects on the likelihood of being active. For *% Female unemployment*, higher unemployment rates among women appear to reduce the demand for nursery services, as mothers outside the labour force may be more inclined to care for their children at home rather than seek external childcare. In the case of *% aged 25 to 54 unmarried*, we hypothesize that individuals in this age group who are not married are less likely to have children, thus reducing the demand for nursery services. The estimated coefficient supports this assumption, as it has a negative sign and a stronger impact on the target variable compared to *% Female unemployment*. Finally, the birth rate plays a key role in explaining the dynamics of the model: its coefficient shows that the share of children in the population is an important driver of municipal policy choices.

Table 3 - *Estimated coefficients of the outcome model (statistically significant).*

	Estimate	Std.Error	z value	Pr(>|z|)
Intercept	-1.470	.4820	-3.0600	.0022**
Under 6 users	-.3690	.0711	-5.1900	.0000***
Average income	.0518	.0086	6.0300	.0000***
% Female unemployment	-.0163	.0048	-3.3900	.0007***
% 25-54 aged nmarried	-.0259	.0096	-2.6900	.0072**
Public funding	.2520	.0508	4.9700	.0000***
Special funding (NGEU-NRRP)	.3270	.0543	6.0300	.0000***
Birth rate	.0776	.0263	2.9600	.0031**

(full output on request)

The variables representing supply-side conditions do not show statistical relevance: the health of local governments have no measurable impact on the likelihood to be *active*. However, a notable effect is observed for the dummy variables indicating participation in NRRP investment programs. This effect is positive and non-negligible in terms of the predicted probability of being a local government that actively pursues its target. NRRP funds, primarily aimed at creating or upgrading infrastructures, play a critical role in addressing infrastructure gaps that significantly hinder municipalities in achieving their goals. The estimated coefficient suggests that access to such funds, which municipalities might not secure through their fiscal capacity alone, makes achieving the nursery service target more feasible.

Finally, the dummy variable representing the number of users in existing facilities (under 6 users) is also significant, with a negative sign. This indicates that municipalities with very low user numbers lack strong incentives to meet the target, potentially redirecting resources to other, more pressing activities. This may reflect a prioritization of limited resources toward areas with higher perceived demand or greater strategic importance. A check on the statistical significance of the correlation parameter is also carried out to corroborate the statistical relevance of the estimates.

4. Conclusion

In this article, we investigated the issue surrounding the provision of nursery services. European legislation has addressed this matter by setting a minimum target, expressed as a percentage, for the availability of nursery places relative to the total resident population aged between 3 and 36 months, which member Countries must guarantee. We discussed the benefits that a progressive increase in this service can provide. On one hand, early childhood education positively impacts cognitive development; on the other hand, nursery services are crucial from a purely economic perspective. Growth in this area has been shown to lead to increased female participation in the workforce. While this is not the place to debate who holds the primary responsibility for infant care, in family dynamics, the lack or scarcity of nursery services often places the burden of childcare primarily on women. In Italy, the provision of nursery services is a pressing issue. In many parts of the country, these services are provided only sparingly and are generally hampered by evident infrastructural and organizational problems. While some regions have managed to meet their obligations, this is far from the case in many areas, with southern Italy being the most prominent example of this disparity. In the article, we presented statistics highlighting the delays and shortcomings in service provision, particularly in meeting the 33% target and intermediate milestones, which are designed to help lagging municipalities catch up. This has led to a divide within Italy, with some municipalities benefiting from funding aimed at achieving these service goals, those that have not yet reached adequate service levels, and others excluded because they have already met the 33% target. Among the *beneficiaries*, a distinction can be made between those municipalities that have acted since 2018 (the *active* ones) and those that, for various reasons, remain stagnant (the *inactive* ones). Our statistical analysis fits within this framework, examining the factors that determine whether a municipality is active or inactive. Beyond territorial dimensions, demand-side factors play a significant role in the likelihood of a municipality being classified as active, although with different magnitude and polarity. Supply-side factors, such as the economic and financial conditions of the entity, do not appear to have a significant impact on achieving service goals, i.e., to be *active*. However, the size of the user base, which in our model is defined as "under 6 users", does influence municipal decision-making, increasing the likelihood of a

municipality not being active in pursuing its assigned target. In general, an increase in demand for nursery services could result in greater compliance from municipalities, compared to the financial background or financial situation of the local government.

From a statistical perspective, we ensured our model was robust against issues of estimate inconsistency through a Heckman-type correction and a convenient simultaneous estimation of the two equations by a *t*-copula.

A significant aspect of the analysis concerns the timing of resource allocation to municipalities. In 2022, under the relevant regulations, funds were transferred only in the latter part of the year. This delay forced some municipalities to hastily initiate public tenders or agreements, creating operational uncertainty. Coupled with a lack of programmatic planning, this led some municipalities to remain *inactive*, failing to meet their objectives. In subsequent years, this issue was addressed by advancing the disbursement of resources to the first part of the year, enabling more effective planning of interventions. A critical factor is the lack of infrastructure capacity, which has limited the utilization of available resources. Investments introduced through the NRRP are expected to play a key role in addressing these structural deficiencies. Another important issue to consider is the paradigm shift resulting from Constitutional Court ruling No. 71 of 2023, implemented through the 2024 Budget Law (Law No. 213/2023). This ruling declared it unconstitutional to reclaim resources allocated for service targets from municipalities that failed to meet their assigned objectives. The decision aimed to avoid harming the rights of citizens residing in the territories of non-compliant entities. The ruling further established that resources designated for service objectives must be transferred to a special fund. Consequently, municipalities were given the opportunity to comply by either detailing the actions they plan to take to meet their objectives or providing justifications for their failure to do so. In cases of continued non-compliance, the entity will face measures, such as being placed under commission or having funds reclaimed.

Our findings could guide policymakers in allocating financial resources aimed at strengthening childcare services. Such interventions must be supported by both central and local authorities, as the latter have extremely limited means to address issues such as female unemployment on their own. These challenges belong to broader policy frameworks that extend well beyond the municipal level. Moreover, infrastructure provision is an area that requires attention — particularly at the European level.

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