How to Reform the Italian Domestic Adoptions System Through a Centralized Market Design

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Abstract

Using an innovative variation of the standard Matching Market Design framework, this draft aims to provide inputs useful to drive the reform of the current Italian Domestic Adoption System (Italian families that desire to adopt an Italian child).

The problem addressed in this draft, concern how to match the relative small number of waiting children to the large number of waiting families in the most rational and efficient way: each year, the adoptions system is not able to place the 20% of the children in foster care, despite the fact that the number of children (supply side) is very small respect the total amount of families (demand side) willing to adopt.

This project is oriented to solve the inefficiencies characterizing the current adoption program, substituting the actual decentralized setup with a more efficient centralized matching market criteria.

Keywords: Matching Market Design, Adoptions System, Matching Algorithm.

*VERY PRELIMINARY DRAFT.
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1 Research Question

Using an innovative variation of the standard Matching Market Design framework, this draft aims to provide inputs useful to drive the reform of the current Italian Domestic Adoption System (Italian families that desire to adopt an Italian child).

The problem addressed in this draft, concern how to match the relative small number of waiting children to the large number of waiting families in the most rational and efficient way: each year, the adoptions system is not able to place the 20% of the children in foster care, despite the fact that the number of children (supply side) is very small respect the total amount of families (demand side) willing to adopt.

This project is oriented to solve the inefficiencies characterizing the current adoption program, substituting the actual decentralized setup with a more efficient centralized matching market criteria.

Two are the main concepts on which this reform draft is based:

(i) shifting from a costly, incoherent and inefficient decentralized system based on regional scale, to a more rational centralized system based on national scale;

(ii) introducing a mathematical perspective finalized to automate part of the adoptive placement process, through the implementation of a matching algorithm able to provide to the social planner a fast and effective indication regarding the compatibility degree between every single child waiting for an adoption and the candidate families willing to adopt.

All considerations developed in this draft are based on a data analysis focused on the most recent bi-annual adoptions cycle 2005-2006, but the same considerations can be extended without any loss in terms of generality, for all the previous adoption cycles.

The second section of the draft provides a general overview concerning the current decentralized adoptions system. The third paragraph contains a simple analysis finalized to stress the high degree of inefficiency that characterize this kind of decentralized setting. Fourth section develops the intuition concerning the new theoretical matching framework – based on centralization and matching algorithm – useful to drive a fruitful reform.

2 Introduction: Decentralized Adoptions System

From the legal point of view, the Italian adoptions system is regulated by Law n. 184/1983[1] and Law n. 149/2001[2]. It is formally and operatively divided in two different branches.

The International Adoptions System[3], managed jointly by the Ministry of Foreign Affairs and the Ministry of Justice through the Government Commission for International Adoption, deals with Italian families willing to adopt foreign children.

The Domestic Adoption System[4], *(un)*coordinated by the Ministry of Justice and based on the system of the Regionals Courts of Minors, deals with Italian families willing to adopt Italian children.

This reform draft is focused only on the latter system.

The following are the typical steps that lead to a matching adoption placement in the current institutional setting:

(i) Children in foster care
Children which are found in situation of neglect, due to the original families are not able to provide an adequate level of care, are declared in a state of adoptability by the Regional Court of Minors having the competence for those children residing in the district. Established that children are in a state of abandonment, starts the adoption procedure which aims to identify the parental couple who can best fit the needs of each child. During the lead time, children are placed in temporary foster care. The Italian Courts of Minors regional network is made up of 29 courts having regional competence (there are 20 courts, one for each region, plus 9 sub-courts).

(ii) Family applications for adoptions
Families willing to adopt a child (having all the prescribed prerequisites) can apply to all the different courts of minors in which they are interested in, to start the preliminary adoption process. Every single family has the possibility to submit more applications to different

[1] Law n. 184/1983, URL: `http://www.giustizia.it/cassazione/leggi/l184_83.html`

[2] Law n. 149/2001, URL: `http://www.giustizia.it/cassazione/leggi/l149_01.html`. Deeply described in Fadiga (2003), Ichino Pellizzi, Zevola (2002).

[3] Documentation available, URL: `http://www.commissioneadozioni.it/Contents/?idPagina=30`

[4] Documentation available, URL: `http://www.giustizia.it/minori/adozioni/adozione_naz.htm`

courts for minors. In line of principle each family has the opportunity to submit 29 applications, one for each court. Due to there are no summary statistics available on this type of data[5], we take as reference the anecdotical evidence[6]: the representative family submits 2 applications in two different courts.

(iii) Court's evaluations and placement process
Each court of minors is in charge to screen independently all the applications that it receives. Applications belonging to the subset that are positively evaluated (applications of course can be rejected due to the family's characteristics are not conform to the requested standards), are classifies respect some specific criteria, having in mind the *objective function* to assign each child to the most appropriate family. In this context, law gives considerable freedom to each court, in terms of procedures criteria and internal organization.

(iv) Pre-adoption trial period
The competent court of minors, on the basis of the investigations and assessments carried out, chooses among families who applied and have been accepted, the most suitable couple with reference to the specific needs of the child. During the entire one year pre-adoption trial period, the court will not only perform control but also support.

(v) Definitive adoption
Completed with success the pre-adoption period (one year), the court assigns definitely the child to the family. This process has a one-year lag respect the adoption application: for this reason to study correctly the dynamics of the adoption process, we must take in account a bi-annual cycle (t_0 =application, t_1 =adoption).

[5]Actually data on this aspect exist, but they are not summarized by any central statistical office.

[6]The source of this information is Associazione Nazionale Famiglie Adottive e Affidatarie, contact: `segreteria@anfaa.it` ; there is also an ISTAT (2006) estimation of 1.9 (for year 2003), contact: `urbano@istat.it` .

3 Evaluations: Inefficiencies in Decentralized Adoptions

The previous brief description on the current adoptions system is sufficient to stress the nature of some major inefficiencies and problems that this kind of decentralized institutional setting entails:

(i) Families have to bear duplication costs on applications procedures, due to the system imposes to produce a new specific application for each different court. In this case, costs are not principally monetary costs, but transaction costs linked to bureaucracy requirements and for instance multiple and repeated interviews to sustain in different regions.

(ii) Ministry has to bear huge duplication costs concerning applications assessments and families classification. This kind of duties have a strong impact on the Ministry's budget as they are extremely labor and time intensive.

In addition to inefficiencies of this nature regarding operative aspects, there are some other more important and substantial negative effects:

(iii) In this system there is room for the paradoxically possibility that an application, positively evaluated by courts A, B and C, in line of principle, can be rejected by court D (or viceversa): this phenomenon brings strong negative implication in terms of making s*afe* for families to participate in the market.

(iv) Because each adoptable child is *locked* in an exclusive regional court, it is clearly possible that in the set of families having applied to that specific court, there is no appropriate one able to fit the needs of a given child, on the other hand a family having all the right features and requirements may be available in the bordering region's court. From the point of view of the demand side (families), this institutional setting leads to a sort of *congestion* issue. On the other side of the market, a relative *(un)thickness* problem arises in the supply side (children) due to the proportional scarcity of children respect the total amount of families applications, in addition to a skewed distribution across the differnt regions in the country.

This kind of inefficiencies and transaction costs determine a strong impact on the capacity of the system to provide an effective matching service, measured as capacity to provide adequate number of matches: analysing data[7] focused on the bi-annual adoptions cycle 2005-2006, is possible to observe that this kind of decentralized programme achieves an inefficient and unsatisfactory matching rate of 78%: giving 6,755 family available for adoptions (corresponding to 13,510 multiple applications), on 1,153 children seeking for

[7]Data available on demand, Minististero della Giustizia - Dipartimento di Giustizia Minorile (Sez. Statistica), contact: `statistiche.dgm@giustizia.it`. Data available from 1993 to 2006.

a family, only 907 have been placed: 246 children (corresponding to the 22% of the total) have not been allocated.

This means that the system achieves only the 78% of the maximal theoretical efficiency level (excluding to account also for all the additional inefficiencies in term of children's welfare loss, budget expenditure, waste of time and duplication costs in the both sides of the market).

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insert FIGURE 1

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insert TABLE 1

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4 Reform Proposal: A New Centralized System

Due to the high degree of decentralization and parcelization of the system, there is no systematic way to sift through 'child positions' made available by different regional courts. Children are *locked* in their specific local court and families are *bounded* in the courts where they have submit the adoption application. This scenario creates a clear bottleneck in adoptive placement.

To design a more efficient adoptions matching program[8] first of all is necessary to centralized[9] the whole process at national level, exploiting all the advantages that a central database/clearinghouse can bring.

After the polling centralization of both sides of the market, this reform project proposes to automate the sequence regarding the comparison between the needs of waiting children and the characteristics of the families. Also in this particular kind of approach, the objective function of the social planner is the maximization of the child's welfare. According to Ward (1997), families' preferences over children are based on their peculiar characteristics in terms of strenghtness; the children's preferences over families are based on their own specific needs. Due to complementarity between child's needs and family's strenghtness, this approach argues that - in some extent - are

[8]The economic literature on matching market design applied to adoptions systems -to my knowledge- is very limited: Balding (2009), Blackstone and Hakim (2003), Blackstone, Buck and Hakim (2004), Blackstone, Buck, Hakim and Spiegel (2008), Hansen and Hansen (2006), Hansen (2007), Landes and Posner (1978).

[9]Note that the current common *consensus* on adoptions systems - in line with all others welfare services, such as health - is oriented to a privatization process through the institution of private and decentralized agencies (Hansen 2007). For instance, this is precisely the case in US, UK and Canada.

the child's needs to drive the entire allocation process: each child will choose (through the social worker intermediation) the candidate family having the right characteristics to satisfy her specific needs.

The *pooling philosophy* can therefore increase the probability that one or more appropriate families, given the specific needs of each child, will be found in the national pool: using this kind of approach, the social planner has the opportunity to increase the number of adoptions from foster care, accelerating the adoptive process and reducing costs of placement. In addition, this draft proposes the new idea to automate (only) a specific sequence of the placement system, in particular the section concerning the classification mechanism. This fundamental step, representing the main pillar on which is based the final matching process, can be fruitfully automated using an extension of a two-sided matching algorithm.

This innovative application to adoptions field, has got as reference framework a peculiar variation of the standard two-sided matching model currently applied to match medical residents with residency positions - NRMP (Roth and Peranson 1999).

In this new framework, all the prospective families interested in adoptions, will apply to just an unique central agency, where the planner (the social staff) will perform all the necessary activities finalized to elicit – though screening and assessments – all the relevant characteristics of each family (representing its preferences) that in a second step will be recorded into a central database on national scale. On the other hand, children in foster care seeking for a placement in a family, will be registered in the same centralize database where the planner (the social staff) is in charge to declare the main needs of each child (representing her preferences over candidate families' characteristics/strenghtness).

Having at its disposal this kind of information set, the planner can now image to design an ad-hoc matching algorithm, constructed in such a way to reproduce the *social worker decison-making*.

The aim of the algorithm is to provide not just one exclusive an univocal matching solution, but a more complete menu of 10 families having the highest compatibility degree in terms of characteristics with reference to each specific child belonging the national pool. Please note, that the scope of the algorithm is not the one to substitute tout-court the social worker experience and her specific human touch during the matching process, more simply it aims to provide a helpful pre-indication based on this innovative typology of compatibility measure, that will lead to faster and more efficient classification and matching process: having at her disposal a pool of 10 potential adequate candidate families selected by the algorithm, social workers will be in the best condition to individuate the more appropriate family for

each child (choosing among the pre-selected panel of families) using the traditional methodology based on interviews and direct assessments.

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insert FIGURE 2

To provide a general idea concerning the specific type of algorithm that this project can implement, it is useful to recall the notions of Complex Matching Algorithms, having the peculiar feature to be able to deal with *matching variation issues* (Roth 1996). In particular, this sophisticated class of matching algorithms provides efficient and stable matches in the most complex scenario where the preferences' structure is characterized by complementarities, lexicographic orderings and linkages between agents involved in the matching mechanism. The typical example in the existing literature, is represented in National Resident Matching Program by couples of doctors (husband and wife) showing complementarities concerning preferences focused over the same slot of hospitals (Kagel and Roth 2000). In the adoption environment on which this draft is focused in, a situation of this nature arise dealing with couples of siblings having preferences oriented to obtain a placement in the same adoptive family. An adoption matching process, based on this class of matching algorithms, provides the fruitfully possibility to achieve a more efficient and fast definition regarding the subset of candidate families, that can be considered suitable with reference to the specific needs of each single child. It is evident that the process will be time saving, as the social worker have to deal just with a restricted and selected subset of candidate compatible families, not with the entire panel of applicant families.

In this kind of framework, most of the resources will invested in collecting all the relevant information on children and candidate families. In line of principle, the institution of the central database - core of the centralized adoptions model and indispensable infrastructure to the matching algorithm - represents an extremely feasible operation.

Exploiting the (latent) Law n. 91/2004[10] titled *Banca Dati dei Minori Adottabili*, there is the clear opportunity to integrate all the anagraphical information regarding children in adoptability status (that are currently collected just for mere administrative purposes), with all the salient and relevant information regarding the payers involved in the both side of the market:

[10]Law n. 91/2004, URL: `http://www.giustizia.it/cassazione/leggi/d91_04.html`

families' characteristics and children's needs[11]. These kind of data are indispensable to run the algorithm.

From the theoretical point of view, complex two-sided matching algorithms are very well suited for application in a matching adoption program environment.

However, because of the sensitive nature of the subject with this reform draft is dealing, it is very relevant to construct and provide evidence that automation based upon this type of model will produce matches satisfactory to social workers and conforming to their *decision-making criteria*. At the same time, it is essential to compile evidence of the potential benefit to waiting children and families, measured in reduced time to adoptive placement, as well as evidence of long run cost savings to Ministry of Justice.

As a first step toward practical application, this draft proposes an assessment based on simulation approach oriented to develop *computational experiments* (Kagel and Roth 2000).

(i) In order to guarantee the characteristics used in the matching algorithm are in line with the characteristics actually considered, researchers will ask to the adoption specialists explain their *decision-making rationality* they apply and follow to design matching decisions. Having available this kind of information, it is possible to stylized a formal model concerning the decision-making approach in adoptions environment and all the variables to take in account to provide reliable and efficient match outcomes.

(ii) Researchers now can create a factious data set on children and families, based on a set of known variables and key characteristics (children's needs and families' features) necessary to meet the requirements and useful to evaluate the compatibility between algorithm's matching output and real social worker matching.

Following this kind of *Scientific Experimental Protocol* to test the reform's effects and its own dynamics, researchers can respond to critics who may be skeptical of depersonalization in the adoption process.

Further, all results coming from the *computation experimental session*, can be used as a basis for interesting comparisons, both with the actual matches made (in other words, can be tested whether perceptions regarding

[11] According to Smith and Howard (1991), the sociological literature tells us how all the most successful adoption matching are characterized by the strictly coincidence of natural parents' features and adoptive parents' features (with particular reference to age aspects). As the 65% of the total children in adoptability status are classified as 'known parents', could be fruitful integrate the database also with data regarding the natural parents.

important criteria in matching activities are consistent with field observations) and with additional and indispensable ex-post policy program evaluations.

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6 Figures & Table

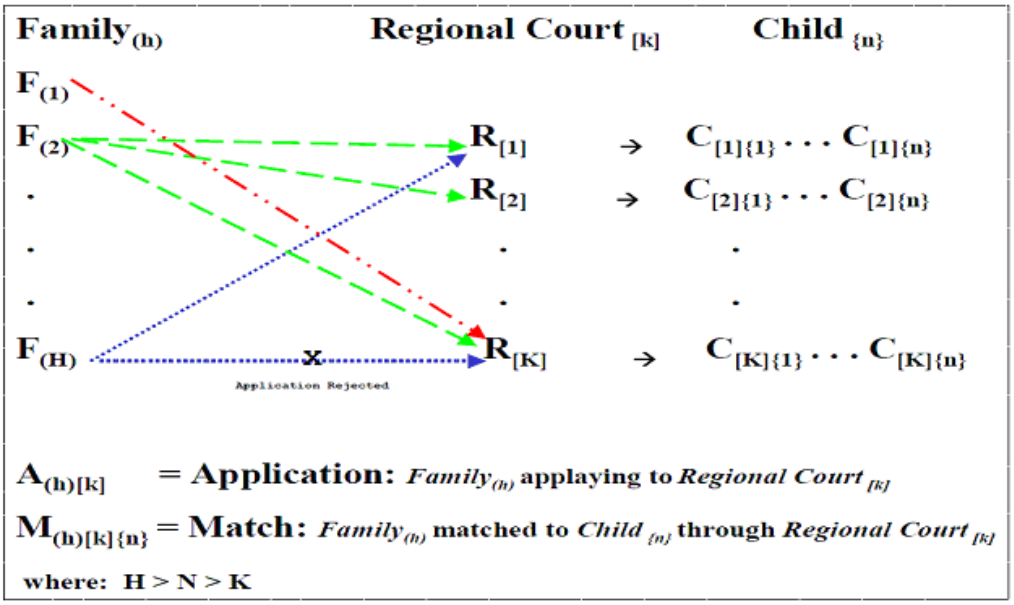

Figure 1: Decentralized Adoptions System

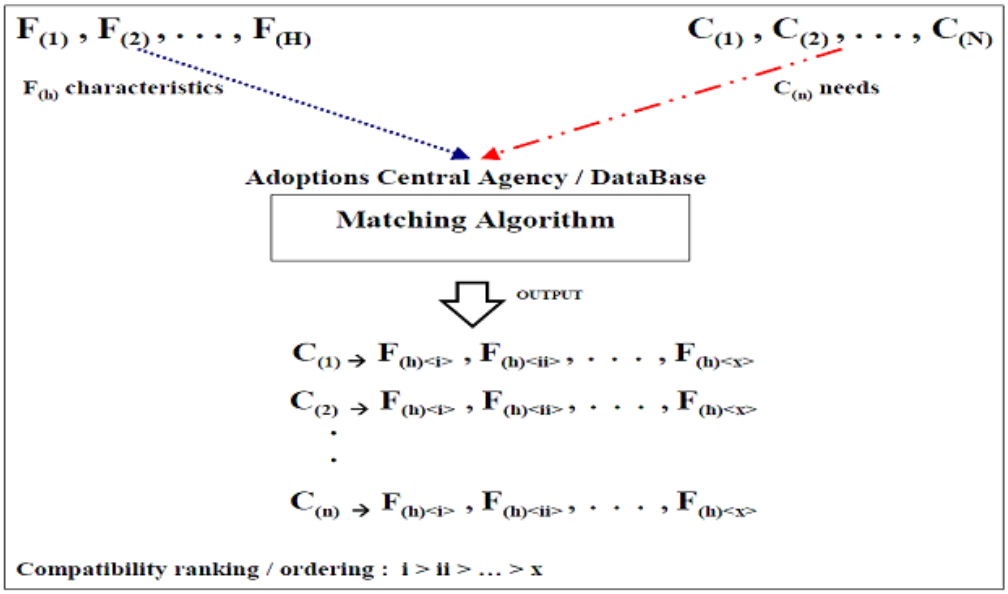

Figure 2: Centralized Matching System

Table 1: Data Analysis bi-annual Adoptions Cycle 2005/2006

Regional Court	**Cu**	**Ck**	**Ct**	**Fd**	**Fn**	**C:F**	**AA**	**Ar**	**EE**
Ancona	8	22	30	506	253	8.43	12	18	40%
Bari	8	61	69	572	286	4.14	22	47	32%
Bologna	31	34	65	867	433.5	6.66	65	0	100%
Bolzano	3	5	8	200	100	12.5	6	2	75%
Brescia	30	14	44	622	311	7.07	42	2	95%
Cagliari	1	47	48	319	159.5	3.32	27	21	56%
Caltaniss.	0	10	10	241	120.5	12.05	4	6	40%
Campobasso	2	1	3	228	114	38	3	0	100%
Catania	4	33	37	499	249.5	6.74	36	1	97%
Catanzaro	12	19	31	356	178	5.74	8	23	26%
Firenze	25	21	46	776	388	8.44	40	6	87%
Genova	6	14	20	471	235.5	11.78	20	0	100%
L'Aquila	5	11	16	385	192.5	12.03	15	1	94%
Lecce	3	2	5	334	167	33.4	5	0	100%
Messina	3	6	9	195	97.5	10.83	5	4	56%
Milano	62	67	129	1483	741.5	5.75	129	0	100%
Napoli	25	40	65	721	360.5	5.55	65	0	100%
Palermo	5	70	75	639	319.5	4.26	59	16	79%
Perugia	7	4	11	360	180	16.36	11	0	100%
Potenza	2	6	8	356	178	22.25	4	4	50%
Reggio Cal.	4	1	5	277	138.5	27.7	5	0	100%
Roma	70	54	124	368	184	1.48	103	21	83%
Salerno	12	5	17	287	143.5	8.44	17	0	100%
Sassari	2	6	8	154	77	9.63	3	5	38%
Taranto	0	12	12	362	181	15.08	6	6	50%
Torino	43	85	128	900	450	3.52	124	4	97%
Trento	3	15	18	259	129.5	7.19	5	13	28%
Venezia	46	66	112	773	386.5	3.45	66	46	58%
TOTAL	**422**	**731**	**1,153**	**13,510**	**6,755**	**5.86**	**907**	**246**	**78%**

(*) Trieste Court of Minors: missing values.
(i) Data provider, Ministero della Giustizia - Dip. Giustiza Minorile (Sez. Statistica)
(ii) Data elaboration, it is my own responsibility.
Cu: Children having unknown natural parents (year 2005)
Ck: Children having known natural parents (year 2005)
Ct: Children Total [Cu+Ck] (year 2005)
Fd: Total Families Demands (year 2005)
Fn: Total Families willing to adopt (year 2005), [Ct/Fd/2], sources ANFAA and ISTAT.
C:F: Child/Families ratio, families available for each child (year 2005)
i.e. 5.86 = 1 child: 5.86 families.
AA: Effective Adoptions (year 2006 - one year lagged than the pre-adoption trial period in 2005)
Ar: Childre not placed.
EE: Efficiency Rate [AA/Ct %].