

# The Flexible-Salary Match: A proposal to increase the salary flexibility of the National Resident Matching Program<sup>☆</sup>

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## Abstract

Most graduating medical students in the United States obtain hospital residencies through the National Resident Matching Program (“NRMP”). The NRMP, or “Match” as it is called, is a centralized procedure that begins each year with hospitals defining residency positions, including a fixed specification of the associated salaries. The Match has been criticized on the grounds that this salary inflexibility biases salaries downward and possibly interferes with efficient allocation of students to positions. This paper proposes a centralized procedure, called the “Flexible-Salary Match,” which makes salaries fully flexible and may help to overcome those problems.

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## 1. Introduction

Most graduating medical students in the United States obtain hospital residencies through the National Resident Matching Program (“NRMP”; <http://www.nrmp.org/>). The NRMP, or

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<sup>☆</sup> This paper describes the proposal discussed in Robinson (2004b) (<http://www.dss.ucsd.edu/~vcrawfor/24matc.htm> and <http://www.dss.ucsd.edu/~vcrawfor/match.jpg>), which gives additional background and commentary. The proposal was presented to the NRMP Board of Directors by one of its members, Daniel Leung, in October 2004. The Board referred it for study to its Executive Committee, to report back at the May 2005 meeting (Leung, private communication).

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“Match” as it is usually called, is a centralized procedure that begins each year with hospitals defining residency positions, including the associated salaries. Both students and hospitals then submit rankings of potential partners, taking hospitals’ predetermined positions and salaries into account.<sup>1</sup> A computer algorithm is then used to match students and positions, keeping the rankings secret. Students and hospitals commit themselves in advance to abide by the results.

Given hospitals’ positions and salaries, the computer algorithm works like the Gale and Shapley (1962) *deferred-acceptance procedure*, explained below, which they proposed as a model of decentralized adjustment processes in *matching markets* like those by which men and women sort themselves into marriages or students sort themselves into colleges. In a striking example of independent discovery, the deferred-acceptance procedure and the Match evolved separately. Their equivalence was first noted only much later, in Roth (1984b). Roth and Sotomayor (1990) give an overview of matching theory, including its application to the Match.

The Match is generally agreed to be a workable and sensible way to match students and residency positions. It overcomes or mitigates some well-documented problems (unraveling of the timing of offers, misrepresentation of rankings, and *recontracting*, or the unwillingness of participants to abide by the results) that have arisen in decentralized professional labor markets, including the U.S. market for residencies before the Match was instituted (Roth, 1984b, 2003; Roth and Peranson, 1999; Niederle and Roth, 2003b). However, plaintiffs in a recent class-action antitrust suit (Jung et al. versus Association of American Medical Colleges et al., 02-CV-00873 (DDC 2002)) have charged, among other things, that by having hospitals set salaries and other aspects of positions in advance of the matching process, the current Match stifles salary competition and thereby keeps residents’ salaries artificially low.<sup>2</sup>

Residents’ salaries are in fact surprisingly low, given their duties and training, averaging less than \$40,000 for an 80-hour work week. And in an illuminating analysis inspired in part by the lawsuit, Bulow and Levin (2006) have given theoretical support to the plaintiffs’ claim. In their model of markets organized like the Match, setting salaries in advance, together with the unpredictability of matching, effectively restricts hospitals to setting salaries for positions rather than students. Under plausible assumptions, this stifles competition and causes salary compression, making salaries lower than in a competitive market with match-specific salaries.

Bulow and Levin also show that markets like the Match can interfere with Pareto-efficiency by limiting the salary variation needed to support the most productive matching of students to positions.<sup>3</sup> Here, Pareto-efficiency is defined in the usual way, taking hospitals’ as well as students’ preferences into account, and given the full possibilities of the market, including flexible match-specific salaries. As explained below, the Match may still produce outcomes that are efficient in a restricted sense, with salaries assumed fixed at predetermined levels, but those outcomes may be Pareto-inferior to some attainable with flexible salaries.

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<sup>1</sup> In fact only some hospital programs post salaries in advance. In other programs students must extrapolate from the program’s salaries in the previous year and learn their exact salaries only after they take up their positions.

<sup>2</sup> The lawsuit was recently dismissed following enactment of an amendment to antitrust law directly targeted at the case (Robinson, 2004a), but plaintiffs are in the process of appealing. Salary and other background information can be found at <http://www.savetheresidents.com/index.asp> and <http://www.savethematch.org/>.

<sup>3</sup> Bulow and Levin suggest that in their model the inefficiency is likely to be small, and caution readers not to apply their analysis too literally to the NRMP, for which not all of their assumptions are realistic.

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