

# Antitrust Lawsuit Against the Resident Match

In 2002, 16 law firms filed a class action law suit, representing 3 former residents seeking to represent all residents, arguing that the NRMP violated antitrust laws and was a conspiracy to depress resident's wages.

The lawsuit was a double class action suit, on behalf of a class of plaintiffs, against a class of defendants including the NRMP, many other medical organizations, and all hospitals that employ residents.

Plaintiffs defined the Plaintiff Class as

All persons employed as resident physicians in ACGME-accredited residency programs (including programs combined of ACGME-accredited programs) since May 7, 1998. ACGME accredited residency programs include subspecialty programs commonly referred to as fellowships. (Plaintiffs' Second Corrected Notice of Motion and Corrected Motion for Class Certification (Jan. 16, 2004).)

Plaintiffs defined the Defendant (class) as:

7 medical organizations (including the NRMP), and  
29 named hospitals (in 16 States) "individually and on behalf of a class of entities similarly situated"

# Complaint

“Defendants and others have illegally contracted, combined and conspired among themselves to displace competition in the recruitment, hiring, employment and compensation of resident physicians, and to impose a scheme of restraints which have the purpose and effect of fixing, artificially depressing, standardizing and stabilizing resident physician compensation and other terms of employment.”

Defendants' illegal combination and conspiracy has restrained competition in the employment of resident physicians by:

(a) stabilizing wages below competitive levels by exchanging competitively sensitive information regarding resident physician compensation and other terms of employment;

(b) eliminating competition in the recruitment and employment of resident physicians by assigning prospective resident physician employees to positions through the National Resident Matching Program (“NRMP”); and

(c) establishing and complying with anticompetitive accreditation standards and requirements through the Accreditation Council for Graduate Medical Education (“ACGME”).

83. “Defendants contract, combine and conspire to restrain competition in the recruitment, hiring, employment and compensation of resident physicians through the NRMP matching program, a mechanism that eliminates a free and competitive market and substitutes a centralized, anticompetitive allocation system assigning prospective resident physicians (“applicants”) to a single, specific and mandatory residency position. . . . The NRMP matching program has the purpose and effect of depressing, standardizing and stabilizing compensation and other terms of employment.”

84. “The anticompetitive purpose and effect of the matching program is revealed in its genesis. In 1952, the hospitals and other entities employing resident physicians determined that the continuation of free competition in recruiting, hiring, employing and compensating resident physicians was undesirable because the number of available residency positions outpaced the number of available candidates. Employers determined that continued free competition would “bid up” compensation and other terms of employment by which employers commonly compete to attract employees. Creating the matching program enabled employers to obtain resident physicians without such a bidding war, thereby artificially fixing, depressing, standardizing and stabilizing compensation and other terms of employment below competitive levels. These anticompetitive goals continue today, as the NRMP itself recently recognized in stating: “The sole purpose of the matching program is to allow both applicants and programs to make selection decisions on a uniform basis and without pressure.”

How should NRMP respond?

## Many to one matching with money

Firms regard workers as substitutes (section 6.2, following Kelso and Crawford)

Workers:  $i = 1, \dots, m$  and Firms  $j = 1, \dots, n$ .

Each firm can hire as many workers as it wishes (i.e. the quota of each firm is  $m$ ) and each worker can work at only one firm.

The utility to worker  $i$  of working for firm  $j$  at salary  $s_i$  is  $u_{ij}(s_i)$ . For each worker  $i$  there is a vector  $\sigma_i := (\sigma_{i1}, \dots, \sigma_{in})$  where  $\sigma_{ij}$  is the lowest salary  $i$  would accept to work for firm  $j$ . That is, the utility to worker  $i$  is the same whether he works for  $j$  at the salary  $\sigma_{ij}$  or is unemployed at zero salary. Let  $u_{i0}(0)$  be the utility to  $i$  of being unemployed at zero salary.



For each firm  $j$  and subset  $C$  of workers,  $Y^j(C)$  is the income of the firm when its employees are precisely the set  $C$ . For all workers  $i$  and firms  $j$

(i)  $Y^j(\emptyset) = 0$  [production requires workers]

(ii)  $Y^j(C \cup \{i\}) - Y^j(C) \geq \sigma_{ij}$  for any set  $C$  of workers which does not contain worker  $i$ . [the marginal contribution of a worker is never less than the salary that would make him indifferent between working or being unemployed.]

(ii) can be regarded as a modeling convention: if a worker's marginal product were less than the minimum wage that would make him indifferent to unemployment, the firm could agree to let the worker do nothing for a zero salary. Here, such a worker will appear employed at salary  $\sigma_{ij} = 0$ , rather than unemployed.

A matching is a set of disjoint partnerships  $\{j, C^j\}$  or  $\{j\}$ , where  $\{j, C^j\}$  denotes that firm  $j$  employs the set  $C^j$  of workers, and  $\{j\}$  denotes that firm  $j$  employs no workers.

An outcome for this model consists of a matching  $\mu$  and, for each partnership  $\{j, C^j\}$  in  $\mu$ , an allocation of income  $Y^j(C^j)$  into  $\pi_j$  (profit) and  $\{s_i, i \in C^j\}$  (salaries) such that  $Y^j(C^j) = \pi_j + \sum_{i \in C^j} s_i$ . If a firm  $j$  is unmatched then  $\pi_j = 0$ . We will denote an outcome by a triple  $(\mu, \pi, s)$ , where  $\pi$  is the vector of profits for each firm  $j$ , and  $m$  is the vector of salaries paid to each worker  $i$  by firm  $\mu_i$ . An outcome  $(\mu, \pi, s)$  is individually rational if  $s_i \geq \sigma_{i\mu(i)}$  for each worker  $i$ , and  $\pi_j \geq 0$  for each firm  $j$ . Salaries are modeled as discrete variables, i.e. there is some smallest unit (e.g. pennies per hour or dollars per year) beyond which salaries cannot be further divided. All salaries  $s_i$  and incomes and profits  $Y^j(C^j)$  and  $\pi_j$  are stated in these units, so they take only integer values.

An individually rational outcome  $(\mu, \pi, s)$  is a core allocation unless there is a firm  $j$ , a subset of workers  $C$ , and a vector  $r$  of salaries  $r_i$ , for all workers  $i$  in  $C$ , such that

$$\begin{aligned}\pi_j &< Y^j(C) - \sum_{i \in C} r_i \text{ and} \\ u_{i\pi(i)}(s_i) &< u_{ij}(r_i) \text{ for all workers } i \text{ in } C.\end{aligned}$$

If these two inequalities are satisfied for some  $(j, C, r)$ , then the outcome  $(\mu, \pi, s)$  is blocked by  $(j, C, r)$ .

If no further restrictions are imposed on the model the core may be empty.

## Example 6.10: An example in which the core is empty.

Firms  $j$  and  $k$ , Workers 1 and 2. Workers' utility equals their salary. Firms' income  $Y^j(C)$  and  $Y^k(C)$  for subsets of workers given by:

$$\begin{aligned} Y^j(\{1\}) &= 4 & Y^k(\{1\}) &= 8 \\ Y^j(\{2\}) &= 1 & Y^k(\{2\}) &= 5 \\ Y^j(\{1, 2\}) &= 10 & Y^k(\{1, 2\}) &= 9 \end{aligned}$$

The only matchings at which no worker is unemployed are

$$\begin{aligned} \mu_1 &= \{j, \{1, 2\}\}, \{k\} & \mu_2 &= \{j\}, \{k, \{1, 2\}\} \\ \mu_3 &= \{j, \{1\}\}, \{k, \{2\}\} & \mu_4 &= \{j, \{2\}\}, \{k, \{1\}\} \end{aligned}$$

It is straightforward to verify that none of these matchings can occur at a core outcome (nor can any matching at which a worker is unemployed).

Firm  $j$  has complementarity: it is willing to employ 2 at a salary of 4 when worker 1 is also employed at a salary of 4, but not when worker 1 is unavailable (or too expensive).

## Gross substitutes:

Let  $s = (s_1, \dots, s_m)$  be a vector of salaries. Let  $M^j(s)$  be the set of solutions to the problem: "Choose  $C^j$  to maximize the profit  $(Y^j(C) - \sum_{i \in C} s_i)$ , for all possible sets  $C$  of workers."

Now consider another vector of salaries  $s'$ . Let

$T^j(C^j) = \{i \mid i \in C \text{ and } s'_i = s_i\}$  That is,  $T^j(C^j)$  is the set of workers in (one of) firm  $j$ 's choice set(s) at salaries  $s$  whose salary demands are unchanged at  $s'$ .

The **gross substitutes** assumption:

(iii) for every firm  $j$ , if  $C^j \in M^j(s)$  and  $s' \geq s$ , then there exists  $\bar{C}^j \in M^j(s')$  such that  $T^j(C^j) \subseteq \bar{C}^j$ .

That is, if a worker  $i$  is in the choice set of firm  $j$  when the salaries the firm must pay to hire each worker are given by  $s$ , then the firm will still want to hire worker  $i$  if the salaries demanded by *other* workers rise, but worker  $i$ 's salary demand does not.

Theorem 6.11 (Kelso and Crawford).

When the gross substitutes condition applies to all firms, the core is nonempty.

We can prove this with a variant of the deferred acceptance algorithm, that is essentially an auction with straightforward behavior. (Notice why gross substitutes will allow a deferred acceptance algorithm to work.)

R(1) - Firms begin facing a set of permitted salaries  $s_{ij}(0) = \sigma_{ij}$ . Permitted salaries at round  $t$ ,  $s_{ij}(t)$ , remain constant, except as noted below. In round zero, each firm makes offers to all workers; this is costless by (ii).

R(2) - On each round, given the schedule of permitted salaries  $s_j(t) = [s_{1j}(t), \dots, s_{mj}(t)]$ , firm  $j$  makes offers to the members of  $C^j(s^j(t))$ , where  $C^j(s^j(t))$  maximizes  $Y^j(C) - \sum_{i \in C} s_{ij}(t)$ . Any offer made by firm  $j$  in round  $t - 1$  that was not rejected must be repeated in round  $t$ . (By the gross substitutes condition, the firm sacrifices no profits in doing this, since (by R4) other workers' permitted salaries cannot have fallen, and the salary of a worker who did not reject an offer remains constant.)

R(3) - worker who receives one or more offers rejects all but favorite one (taking salaries into account), which he or she tentatively accepts. Workers break ties however they like.

R(4) - Offers not rejected in previous periods remain in force. If worker  $i$  rejected an offer from firm  $j$  in round  $t - 1$ ,  $s_{ij}(t) = s_{ij}(t - 1) + 1$ ; otherwise  $s_{ij}(t) = s_{ij}(t - 1)$ . Firms continue to make offers to their favorite sets of workers, taking into account their permitted salaries.

R(5) - The process stops when no rejections are issued in some period. Workers then accept the offers that remain in force from the firms they have not rejected.



Proof: The algorithm produces an outcome in the core.

The algorithm stops after a finite number of rounds.

$s_i \geq \sigma_{ij}$ , for all  $i = 1, \dots, m$ , if  $i$  and  $j$  are matched by  $\mu$ , and  $\pi_j \geq 0$  for all  $j = 1, \dots, n$ , so the outcome is individually rational.

When the algorithm stops every worker is holding exactly one offer.

Furthermore the set of workers  $C^j$  assigned by  $\mu$  to  $j$  gives to  $j$  the maximum net profit it could get among all possible subsets of workers at salaries  $s_{ij}(t^*)$ , where  $t^*$  is the round at which the algorithm stopped. That is for all subsets of workers  $C$ :

$$\pi_j \geq Y^j(C) - \sum_{i \in C} s_{ij}(t^*) \quad (1)$$

If some  $(j, C, r)$  blocked the outcome  $(\mu, \pi, s)$ , where  $r$  is a set of integer salaries, we would have

$$u_{ij}(r_i) > u_{i\mu(i)}(s_i) \text{ for all } i \text{ in } C \quad (2)$$

$$\text{and } Y_j(C) - \sum_{i \in C} r_i > \pi_j \quad (3)$$

By (2) and R3, worker  $i$  must never have received an offer from firm  $j$  at salary  $r_i$  or greater, for all  $i$  in  $C$ . So  $s_{ij}(t^*) \leq r_i$  for all  $i$  in  $C$ . But then we have the contradiction

$$\pi_j < Y^j(C) - \sum_{i \in C} r_i \leq Y^j(C) - \sum_{i \in C} s_{ij}(t^*).$$

When all firms and workers have strict preferences, the outcome produced by this algorithm is the “second price,” firm-optimal core outcome.

The gross substitutes assumption is of course quite strong. For example, aside from ruling out that firms may have technologies with increasing returns of the sort exhibited in Example 6.10, the assumption also rules out simple budget constraints. The following example shows that, even when the firm’s technology obeys the gross substitutes assumption, the introduction of budget constraints may introduce complementarities that will cause the core to be empty.

Example 6.12: budget constraints and an empty core (Mongell and Roth '86)

Two firms,  $j$  and  $k$ , and three workers, 1, 2, and 3

$$Y^j(\{1\}) = 700 \quad Y^k(\{1\}) = 600$$

$$Y^j(\{2\}) = 1400 \quad Y^k(\{2\}) = 1500$$

$$Y^j(\{3\}) = 800 \quad Y^k(\{3\}) = 1100$$

$$Y^j(\{1, 2\}) = 2100 \quad Y^k(\{1, 2\}) = 2100$$

$$Y^j(\{1, 3\}) = 1500 \quad Y^k(\{1, 3\}) = 1700$$

$$Y^j(\{2, 3\}) = 2200 \quad Y^k(\{2, 3\}) = 2600$$

$$Y^j(\{1, 2, 3\}) = 2900 \quad Y^k(\{1, 2, 3\}) = 3200$$

$$\sigma_{1j} = 400 \quad \sigma_{1k} = 300$$

$$\sigma_{2j} = 700 \quad \sigma_{2k} = 1000$$

$$\sigma_{3j} = 400 \quad \sigma_{3k} = 700$$

Note  $Y^j$  and  $Y^k$  are separable (the product of two workers is just the sum of their separate products) so the gross substitutes condition holds for both firms.

Now impose budget constraints on firms  $j$  and  $k$ ;  $\sum s_i \leq B^j = 440$  for  $i \in C^j$  and  $\sum s_i \leq B^k = 1075$  for  $i \in C^k$ . The gross substitutes condition applied to the preferences with this constraint no longer holds for firm  $k$ . Consider  $s = (300, 1000, 700)$  and  $s' = (380, 1000, 700)$ . When the salaries are  $s$ , the unique preferred set of workers for firm  $k$  (subject to its budget constraint) is  $\{1, 3\}$ . But when the salaries are  $s'$ ,  $k$  cannot afford to hire workers  $\{1, 3\}$  and chooses  $\{2\}$ . Even though worker 3's salary demand does not change, the firm only chooses to employ him if worker 1 can be hired at the lower salary.

In a centralized market, to get a core outcome with wages, need that the firms and workers preferences allow for wages. The NRMP does not allow for wages.

Match matches residents to hospitals at prenegotiated terms. Does this lead to the core outcome of wages?

Bulow, Jeremy and Jonathan Levin, "Matching and Price Competition" American Economic Review, 96(3), June 2006. They compare a situation in which firms can make offers to workers where wages can depend on the identity of the worker, and one in which wages are set for the position.

They find that, relative to a competitive benchmark when salary offers are not personalized, salaries are compressed and lower in the aggregate.

What is the idea?

I'll show you things in a very simple example, shows the main characteristics of their proofs.

Suppose there are 3 firms and 3 workers.

Workers have a reservation wage of 0, and only want to maximize wages.

Firm  $i$ , when matched to worker  $j$  receives  $ij$  from which it has to pay the worker.

Efficient match: assortative matching.

Competitive wages:

- ▶  $p_1$  between 0 and 1
- ▶  $p_2$  between  $p_1 + 1$  and  $p_1 + 2$
- ▶  $p_3$  between  $p_2 + 2$  and  $p_2 + 3$



Centralized match with posted wages:

No pure strategy equilibrium

No atoms (except at 0).

0 must be offered, and every wage must be offered by at least 2 firms.

Think of firms randomizing with certain densities (quit rates) over wages.

For firm 1 to be indifferent to offer that wage or not, need

$$q_2 + q_3 = 1.$$

For firm 1, the marginal value of a better worker is 1. Therefore, to pay an additional increment in wages it must increase the expected increase in quality by the same amount, which is  $q_2 + q_3$ .

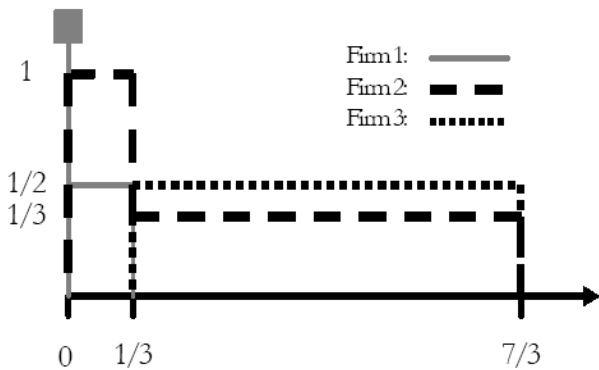
For firm 2:  $q_1 + q_3 = 1/2$ , for firm 3:  $q_1 + q_2 = 1/3$

These 3 equations lead to a negative value of  $q_1$ . So, only 2 and 3 will be randomizing at the top wage. Their quit rates will be  $q_2 = 1/3$  and  $q_3 = 1/2$ .

Firm 3 can only randomize over a range  $p - 2, p$

Firm 2 has a  $1/3$  probability mass remaining to distribute over the range where it competes with firm 1.

In the range where firm 1 and firm 2 compete need  $q_1 = 1/2$  and  $q_2 = 1$ . Given firm 2's quit range the range is  $1/3$ , and it must start at 0, we get the following figure.



Equilibrium in the Multiplication Game

**Table 1. The Multiplication Game**

Wages		Profits	
Worker 1	0.02 (0)	Firm 1	1.00 (1)
Worker 2	0.73 (1)	Firm 2	3.67 (3)
Worker 3	1.56 (3)	Firm 3	6.67 (6)
Total	2.31 (4)	Total	11.33 (10)

The plaintiffs made prominent mention of the paper Bulow and Levin. So, now we know the theory for matching with wages:

How should NRMP respond?

While the plaintiffs made prominent mention of the paper Bulow and Levin note (pp.3-4)

"While we frame the paper in terms of the residency match, we caution readers not to draw strong inferences for the antitrust case against the NRMP."

Several reasons for such caution (aside from modeling residents as being concerned only with their wage).

One of these is that the "but-for" world to which they compare the Match is one in which firms pay different workers in the same position different wages. They note that this is not in fact a general feature of many decentralized markets in fields other than medicine. They mention law, investment banking and academics as three decentralized markets that share this property of impersonal wages with the medical residency market.

Kojima, Fujito, Matching and Price Competition: Comment, (2007), American Economic Review 97, pp 1027-1031.

“We show that [the] conclusions [of BL] do not necessarily hold when firms may hire more than one worker and the number of workers in different firms are different.”

Niederle, Muriel, “Competitive Wages in a Match with Ordered Contracts”, American Economic Review, vol. 97, No.5, December 2007, 1957 – 1969.

The algorithm of the NRMP allows for reversions or ordered contracts:

In a model with ordered contracts, every firm  $i$  can have up to  $K$  contracts  $p_i^1, \dots, p_i^K$ . Let  $P_i$  be the set of contracts and  $K_i$  the number of contracts of firm  $i$ . For each contract  $p_i^k$  firm  $i$  specifies a strict preference ordering over the set of workers eligible for this contract  $W_i^k \subseteq W$ . Furthermore, firm  $i$  has a strict ordering over which contract should be filled first. Let the first contract be  $p_i^1$ , and only if firm  $i$  cannot fill the position at  $p_i^1$  will firm  $i$  try to recruit workers at  $p_i^2$ , and so on.



Firm  $f$  has preferences over  $\{f\} \cup P_i \times W$ , where, by definition, for any  $k, j$  such that  $k + j < K_i$ ,

$$\forall w \in W_i^k, \forall w' \in W_i^{k+j}, (p_f^k, w) \succ_f (p_f^{k+j}, w')$$

Let  $P_F$  be the total set of contracts.

A *matching* is a function  $\mu : P_F \cup W \rightarrow P_F \cup W$  such that :  $\forall w, \forall p_f$  :

- ▶ (i) :  $|\mu(w)| = |\mu(p_f)| = 1$ ;
- ▶ (ii) :  $\mu(w) \in P_F \cup \{w\}$  and  $\mu(p_f) \in W \cup \{p_f\}$
- ▶ (iii) :  $\mu(w) = p_f \Leftrightarrow w = \mu(p_f)$
- ▶ (iv) :  $\forall f : |\{p_f : \mu(p_f) \in W\}| \leq 1$ .

A matching is stable if

- ▶  $\forall w, p_f, f$  : If  $\mu(w) = p_f$  then  $\mu(w) \succ_w w$  and  $\mu(f) \succ_f f$
- ▶  $\nexists w, p_f, f$  such that  $p_f \succ_w \mu(w)$  and  $(p_f, w) \succ_f \mu(f)$

## Firm proposing Modified Deferred Acceptance

**MDA step1:** Firms have only their first contract available.

- ▶ DA step 1: Firms make offers to their most preferred workers. Workers collect their offers, keep their most preferred acceptable offer, reject any other offer.
- ▶ DA step  $k$ : Firms whose offer was rejected in round  $k - 1$  make an offer to their next most desirable worker. Workers collect their offers, keep their most preferred acceptable offer, reject any other offer.
- ▶ DA ends when no offer is rejected, or all rejected firms have no more offers to make.

**MDA step  $k$ :** Any firm  $i$  that has its position at the  $j^{\text{th}}$  contract  $p_i^j$  unfilled changes the contract to  $p_i^{j+1}$  in case it has another contract to revert to. Then the algorithm continues with a DA sub-algorithm (where previous offers can be left outstanding.)

**The algorithm ends** when all firms that have no offer held by an applicant have no more contracts to revert to. Workers who hold an offer from a firm at a contract are matched to that firm at that contract.

# Worker proposing Modified Deferred Acceptance

**MDA step1:** Firms have only their first contract available.

- ▶ DA steps (just as before)

**MDA step k:** Any firm  $i$  that has its position at the  $j^{th}$  contract  $p_i^j$  unfilled changes the contract to  $p_i^{j+1}$  in case it has another contract to revert to. All previous offers are annulled.

- ▶ DA steps (where no worker has any outstanding offers initially)

**The algorithm ends** when all firms that have no offer have no more contracts to revert to. Any worker whose offer is held by a firm at a specific contract is matched to that firm at that contract.

#### Theorem 4 (Stability)

Whenever firms have a strict ordering over a finite number of contracts, which are ordered contracts, and for each contract a strict preference ordering over the workers, and workers have a strict ordering over firm-contract pairs, then both the firm and worker proposing MDA yield a stable outcome.

#### Theorem 5 (Firm-Optimal Stable Match)

The firm proposing *MDA* yields the firm-optimal stable match.

A result that is only true with ordered contracts, but not in general when firms offer multiple contracts simultaneously, is:

Theorem 6:

The two (possibly different) stable outcomes reached through the worker proposing *MDA* and the firm proposing *MDA* have the same set of workers and the same set of firms matched at the same contracts.

This implies immediately that the worker optimal stable match is not reached by the worker proposing *MDA*. This implies that workers may have incentives to misrepresent their preferences even in the worker proposing *MDA*.

The *NRMP* uses a variant of a worker proposing *MDA*. What are the implications on the simple model of Bulow and Levin?

Let for every worker  $i$ ,  $c_i$  be the competitive equilibrium wage. Then we have the following that assures a competitive equilibrium:

### Theorem 3: Competitive Equilibrium Wages

The following strategies form a Nash equilibrium. Every firm announces  $p_i = c_i$  for  $1 \leq i \leq N$  and  $p_N^* = c_N$  with only worker  $w_N$  being eligible, and  $p_j^* = c_{j+1}$  for  $j < N$  and the workers being eligible for  $p_j^*$  are workers  $w_{j+1}$  and higher. The workers report their preferences truthfully, that is, they rank all contracts such that they prefer higher wages to lower wages, and for a given wage they prefer more productive to less productive firms.

## Survey of gastro fellowship directors (Niederle, Proctor, Roth, 2006)

### Personalized wages?

“Out of 63 program directors, all but 4 (94%) offered the same wage to all their fellows. Furthermore, all but 4 (although not all the same 4 programs) offered the same hours on call. Eighteen of the 63 programs (29%) offered different fellows different amounts of time for research; all but 3 of these programs formally differentiated the kinds of fellows doing different jobs (ie, they had at least 2 kinds of fellows). All program directors responded that offers are not adjusted in response to outside offers and terms are not negotiable. Thus, while different programs offer different wages and terms, and while program directors respond in many other ways to the contingencies that arise in the course of the hiring process, it does not appear that they adjust the terms of their offers to the situations of individual candidates.”

So the issue of impersonal wages is one that deserves greater attention even in decentralized markets. . .

# Empirical Evidence Does a Match Affect Wage Levels?

There are 14 internal medicine subspecialties of which 4 use the match and 10 do not.

We can compare wages of specialties that use the Match and those that do not.

- ▶ Niederle, Muriel, and Alvin E. Roth, "Relationship Between Wages and Presence of a Match in Medical Fellowships," JAMA, Journal of the American Medical Association, vol. 290, No. 9, September 3, 2003, 1153-1154.
- ▶ Niederle, Muriel and Alvin E. Roth, "The Gastroenterology Fellowship Match: How it failed, and why it could succeed once again," Gastroenterology, 127, 2, August 2004, 658-666..



Specialty	Match	# Programs	Mean Wage	St. Dev	Min	Max
PUD	MSMP	26	45,418	5,859	37,185	58,536
CCM	No	31	43,460	3,367	36,966	50,422
IMG	No	90	43,266	4,989	28,200	58,536
HEM	No	17	42,952	4,739	36,000	51,853
ON	No	24	42,650	4,922	28,200	51,853
HO	No	110	42,526	4,415	32,000	58,328
NEP	No	118	42,426	4,357	30,733	58,328
ID	MSMP	124	42,352	4,863	30,000	58,328
CD	MSMP	153	42,288	4,246	26,749	54,450
PCC	MSMP	111	41,973	4,268	26,916	53,463
<b>GE</b>	<b>No</b>	<b>142</b>	<b>41,800</b>	<b>4,638</b>	<b>26,000</b>	<b>58,328</b>
END	No	103	41,656	4,000	33,700	53,463
ISM	No	2	41,390	1,259	40,500	42,280
RHU	No	97	41,182	4,743	28,824	58,328

- ▶ Regressing the wage on a Match dummy yields: match effect \$ 208.33 (s.e. 279.82).
- ▶ Controlling for hospital fixed effects the Match dummy has a value of  
$$\$343.86(s.e.152.60).$$
- ▶ No obvious effect of a Match on Salaries.
- ▶ Similar results when looking at Pediatrics (where, also, only some subspecialties use a Match).

## New legislation

The strategy of attacking scores of defendants:

- ▶ Raises defense costs, makes a settlement more attractive?
- ▶ However, many senators have hospitals in their constituency. . .

In April President Bush signed into law, as an addendum to the Pension Funding Equity Act of 2004.

Congressional finding:

(E) Antitrust lawsuits challenging the matching process, regardless of their merit or lack thereof, have the potential to undermine this highly efficient, pro-competitive, and long-standing process. The costs of defending such litigation would divert the scarce resources of our country's teaching hospitals and medical schools from their crucial missions of patient care, physician training, and medical research. In addition, such costs may lead to abandonment of the matching process, which has effectively served the interests of medical students, teaching hospitals, and patients for over half a century.

“It is the purpose of this section to

(A) confirm that the antitrust laws do not prohibit sponsoring, conducting, or participating in a graduate medical education residency matching program, or agreeing to do so; and

(B) ensure that those who sponsor, conduct or participate in such matching programs are not subjected to the burden and expense of defending against litigation that challenges such matching programs under the antitrust laws.”

**CONFIRMATION OF ANTITRUST STATUS-** It shall not be unlawful under the antitrust laws to sponsor, conduct, or participate in a graduate medical education residency matching program, or to agree to sponsor, conduct, or participate in such a program. Evidence of any of the conduct described in the preceding sentence shall not be admissible in Federal court to support any claim or action alleging a violation of the antitrust laws.

**APPLICABILITY-** Nothing in this section shall be construed to exempt from the antitrust laws any agreement on the part of 2 or more graduate medical education programs to fix the amount of the stipend or other benefits received by students participating in such programs.

## Aftermath of the legislation

The suit was dismissed on August 12, 2004 in an Opinion, Order & Judgment by Judge Paul L. Friedman.

In June 2006 the appellate court upheld the dismissal, and on January 8, 2007 the Supreme Court denied plaintiffs' petition to hear an appeal of the dismissal