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The importance of the physician in the generic versus trade-name prescription decision

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I examine the importance of physicians in the process by which patients receive either trade-name or generic drugs. Using a dataset on physicians, their patients, and the multisource drugs prescribed, I find that almost all physicians prescribe both types of drugs to their patients, but some physicians are more likely to prescribe generic drugs while other physicians are more likely to prescribe trade-name drugs. Very little of the prescription decision can be explained by observable characteristics of individual patients, but all of the evidence indicates that physicians are indeed an important agent in determining whether patients receive either trade-name or generic drugs.

1. Introduction

■ In 1989, over 70% of pharmaceutical prescriptions were written for multisource drugs, that is, drugs for which both generic and trade-name versions are available. Yet of these multisource prescriptions, fewer than 30% specified the generic version of the drug. Since generics are generally priced 30–60% lower than their trade-name counterparts (Grabowski and Vernon, 1992), substantial cost savings could be realized in this $40-billion-per-year market if generics captured greater market share. Possible explanations for the paucity of generic prescriptions include the existence of information imperfections that limit the physician's knowledge, and agency problems arising from the physician acting as agent for the patient and for the patient's insurance company.

In this article I examine whether the seemingly small market share of generics can be attributed at least partially to the behavior of physicians. Using data from a survey of physicians, their patients, and the drugs prescribed, I examine whether physicians vary their prescription decisions on a patient-by-patient basis or whether they systematically prescribe the same versions (trade name or generic) to all patients. I test whether

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physicians are more likely to prescribe generics to patients who do not have insurance coverage for prescription pharmaceuticals. I also examine the effects of state legislation on generic prescription.

The results indicate that physicians are indeed key decision-making agents in the prescription decision. The reason why some physicians are more likely to prescribe generic drugs while others are more likely to prescribe trade-name drugs is largely left unexplained. Studying the evolution of physician behavior and how it is affected both by mechanisms of information diffusion (such as advertising) and by the structure of the health care delivery system should be an important topic for future research.

The article proceeds as follows. Section 2 reviews the basic facts and existing literature involving generic pharmaceuticals, insurance coverage for prescription drugs, and other salient institutional facts. Section 3 describes the characteristics of the dataset used and reports relevant summary statistics. Section 4 introduces a model of physician demand for generics, and Section 5 discusses an empirical estimation framework based on this model and the data. Section 6 discusses the estimation results and their interpretation. Section 7 contains the conclusion and suggestions for future research.

2. Background and related literature

■ **The introduction of generics.** Before 1984, generic pharmaceuticals were relatively uncommon. Any firm that wanted to market a post-patent expiration generic had to prove to the Food and Drug Administration (FDA) the drug's efficacy and safety by conducting exactly the same tests as those required of the original innovator. This constituted a substantial barrier to entry.[1]

In 1984, Congress passed the Drug Price Competition and Patent Term Restoration Act of 1984, commonly known as the Waxman-Hatch Act. This legislation was intended to reduce expenditures on prescription drugs by encouraging generic entry. It eliminated the strict requirements for FDA approval of generic substitutes and replaced it with one that requires much less stringent testing.

The Waxman-Hatch Act stipulates that a firm wishing to gain approval for distribution of a generic drug must prove to the FDA that its drug is essentially the same as the original patented drug in all dimensions except inert ingredients, shape, packaging, labelling, and shelf life. Passage of the Waxman-Hatch Act was followed by a dramatic increase in the number of generic drugs in the market (Grabowski and Vernon, 1992).

□ **State substitution laws.** The other major legislative change affecting generic entry has been the repeal of state antisubstitution laws. Twenty-five years ago, most states had some kind of law that prohibited a pharmacist from dispensing any drug other than the one expressly written by the physician. This barred generic substitution by pharmacists. By 1989, in response to growing concerns about the perceived high costs of prescription drugs, all states had repealed these laws in an effort to encourage the use of generic drugs.

Most states now have what are known as "permissive substitution laws" that allow a pharmacist to substitute a therapeutically equivalent drug for the one written on the prescription.[2] Twelve states have mandatory substitution laws that require the pharmacist to substitute if the generic drug is in stock and is cheaper than the prescribed

[1] The only exception to the pre-1984 FDA approval process was for antibiotics. Approval to produce generic antibiotics has always been relatively easy. For more details, see Hellerstein (1995).

[2] For a detailed study of the effects of state legislation on pharmacist substitution in the early 1980s, see Masson and Steiner (1985).

drug.[3] In both cases, the physician can override the possibility of substitution by prohibiting pharmacist substitution on the prescription itself. I discuss below how these laws can affect physician behavior.

There are two methods of substitution prevention. In both methods, the physician must sign the prescription. The difference between the methods has to do with how the physician prohibits substitution by the pharmacist for generics. Some states use prescription pads with the "two-line method." In this method the physician signs the prescription either on a line that reads "brand medically necessary" or on a line that reads "substitution allowed." The line on which the physician signs his or her name thus determines whether the pharmacist can substitute.[4] Other states have a one-line method (also called "active substitution method"), in which the physician signs the prescription in only one place. If the physician just signs his or her name, the pharmacist is allowed to substitute and dispense a generic. In one-line states, to prohibit substitution the physician, in addition to signing the prescription, must take some extra action. This can take the form of entering the physician's initials in a box at the bottom of the prescription form or writing "brand medically necessary" in a designated spot on the prescription.

Interestingly, this seemingly minor difference in prescription pads (that is, the extra action in one-line states of putting initials in a box or writing three extra words) has a huge impact on whether substitution is allowed. In 1989, substitution was prohibited in 41% of two-line brand-written prescriptions but in only 11% of brand-written prescriptions that required more than a signature from the physician (*Drug Topics,* 1991).[5] This difference in prescription-writing behavior clearly shows that even very small costs have a large effect on physician decisions. Why this extra action matters so much is not clear, but given the small cost of adding extra information to the prescription, the difference in prescription-writing behavior across states suggests the presence of serious agency problems in the current delivery system for prescription drugs.

With all of this legislation to promote substitution, it is rather surprising that generic substitution by pharmacists is not very prevalent. Generic substitution by pharmacists occurred in less than 30% of trade-name-written prescriptions (for which a generic was available) in 1989, while nearly all prescriptions written by physicians for generics were, in fact, filled by pharmacists with the generic drug (Caves, Whinston, and Hurwitz, 1991). It seems that strict adherence to state legislation on the part of pharmacists is probably not occurring, although data on this are sketchy. Because generic substitution by pharmacists does not occur in the majority of the cases—either because of physician prohibition or pharmacist or patient preferences—the actual drug name written on the prescription by the physician still has the greatest impact on which type of drug the patient will receive. The decision to write the trade name or generic name on the prescription is exactly the decision studied in this article.

□ **Physician prescription practices: the roles of information imperfections, agency, and moral hazard.** The purpose of this section is to outline possible reasons why

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[3] The states with mandatory substitution laws are Florida, Hawaii, Kentucky, Massachusetts, Mississippi, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Washington, and West Virginia.

[4] The states with the two-line method are Alabama, Arizona, Idaho, Illinois, Indiana, Kansas, Mississippi, Missouri, North Carolina, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont, Washington, and Wyoming. I code Maine as having a one-line substitution law since the law says that to prohibit pharmacist substitution, a physician in Maine must check a box on the prescription form. It appears that in *Drug Topics* (1991), Maine is categorized as a "two-line" state. Given how few prescriptions are written in Maine, into which category it is placed is not quantitatively important.

[5] The figures reported in *Drug Topics* (1991) are raw differences across states. No further breakdowns of the data on substitution patterns are given.

physicians do not prescribe generic drugs more often. In the empirical work that follows, I explicitly test for some of these reasons. Others (especially information imperfections) are not tested explicitly but are important and help motivate the empirical work.

Since physicians generally do not benefit financially from the prescription choices they make for their patients,[6] it might seem that physicians should act as perfect agents for their patients, prescribing only those drugs that the patient would choose if the patient were the decision-making agent (as suggested by Dranove (1989)). If, however, there are costs to the physician associated with prescribing drugs, physicians may not act as perfect agents for their patients.

These costs to the physician of prescribing drugs can take many possible forms, one of which, the small cost of filling out the information on the prescription pad, was discussed in the previous section. Another cost to the physician comes from collecting information on the availability and efficacy of generics and the price differential between generics and trade-name drugs. After the patent on a trade-name drug expires, it may take time for information to diffuse about the existence and name of the generic. In addition, a risk-averse physician may not prescribe a generic until its efficacy is well established. Generic drug manufacturers do very little advertising, while information about new trade-name drugs is widely disseminated formally through advertising and the published results of drug efficacy studies. It may therefore be much more costly to a physician to learn about the introduction of new generic drugs. In addition, there is evidence that physicians have little knowledge of actual drug prices (Temin, 1980; Kolassa, 1995). Despite large expenditures on advertising in the industry,[7] promotional information seldom reports actual prices.[8] The fact that physicians do not know the costs of the drugs they prescribe suggests that they cannot be fully price sensitive in that, at best, they can only estimate the magnitude of cost savings from generics.

In general, the existence of any positive costs (even if small) associated with information collection about generics may lead the physician to underinvest (relative to the patient's optimum) in gaining this information, since the physician gets essentially no direct return to the investment. Indeed, the whole issue of agency imperfections in physician decision making was one of the implicit motivations for the passage of state substitution laws that make it easier for pharmacists to substitute generic drugs when physicians write prescriptions for trade-name drugs. With these laws, the physician does not have to have any explicit information about the existence of a generic drug. The physician can write a prescription for a trade-name drug knowing that unless the prescription prohibits substitution by the pharmacist or unless the patient refuses, the patient will receive a generic version if one exists.

Even if the physician acts as a perfect agent for his or her patients, there may still be agency problems associated with prescription decisions if the physician is acting as perfect agent for the patient but not for the patient's insurer. This type of agency

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[6] Only 2% of physicians dispense their own drugs (Shah, 1992), and the practice is outlawed in some states. This is not to say that physicians do not benefit from relationships with pharmaceutical companies. The direct advertising that pharmaceutical companies undertake, called "detailing," can lead to lucrative rewards for physicians. It is unlikely, however, that physicians perceive that these rewards result from the actual prescriptions they write.

[7] Caves, Whinston, and Hurwitz (1991) find that for their sample of drugs, average sales promotion as a proportion of sales was 6% in the year in which the patent expired.

[8] An interesting piece of evidence pointing to the lack of information on the part of physicians is the success of Medco, a large mail-order pharmacy, which contacts physicians to try to persuade them to substitute lower-priced drugs for the drugs they have prescribed. Medco persuades physicians to switch to the lower-cost product in one-quarter to one-half of the cases it pursues (Boston Consulting Group, 1993). This indicates a willingness of some physicians to be price-sensitive given adequate information on efficacy and price.

problem has been called "moral hazard" in the market for insurance. This use of the term "moral hazard" follows Pauly (1968) and the definition often used in the health economics literature. It refers to the fact that patients may demand (and receive) too much care relative to the social optimum because the existence of insurance means they do not directly bear the full marginal cost of care. This definition of moral hazard in insurance contrasts with the more commonly used definition, which suggests that the existence of health insurance leads patients to engage in more risky behavior. While this latter type of moral hazard certainly may exist, Pauly (1968) points out that even with totally risk-averse patients, the existence of insurance may lead to overconsumption of health care just because the marginal cost of treatment is not borne by the patient.[9] In the case of prescription drugs, moral hazard in insurance may mean that the insured patient does not have the incentive to induce the physician to invest in collecting information on low-cost treatments for patients with insurance. Even if the physician does have full information, moral hazard may mean that the patient does not demand the socially optimal amount of prescription drugs and instead receives either too many drugs or too expensive drugs (like trade names) relative to what is socially optimal. This type of suboptimal use of prescription drugs is modelled in the next section.

How insurance for prescription drugs affects physicians' prescription decisions depends in practice, of course, not only on the physician but also on the nature of the insurance. It is therefore important to understand the differences in the treatment of prescription drugs across different insurance plans in the United States.

There is wide heterogeneity across private insurance plans in the coverage of prescription pharmaceuticals. Figures from 1989 and 1990 indicate that 25–30% of private insurance plans had some prescription drug coverage.[10] Of those individuals covered by some prescription drug coverage, 3% had full coverage for prescription drugs, 30% had some copayment or separate deductible for prescription drugs, 61% had prescription drug coverage under the same rules as all coverage in their plan, and 7% were covered by other types of limits on payments (U.S. Congress, 1993). It is not clear how much physicians know about the prescription drug coverage of their patients with insurance, however, so it is not clear whether a physician treating a patient with private insurance will make prescription decisions based on the knowledge that the patient has insurance. I return to this point again in Sections 3 and 6 when discussing the data and empirical results.

Health maintenance organizations (HMOs), because of their distinct contractual structure in the delivery of health care, are a unique type of insurance provider for prescription drugs. In particular, HMOs, unlike traditional fee-for-service private insurance plans, often explicitly specify terms under which generic substitution by pharmacists is allowed. A 1988 survey of HMOs (Doering et al., 1988) found that over 70% of HMOs did have some sort of policy on generic substitution by the HMO pharmacy. Of the 188 HMOs that responded to the survey, 38.3% substituted generics except when prohibited by the physician and 32.5% dispensed generics except when the patient insisted on receiving the trade-name drug. In cases where the recipient refused the generic, the patient was usually required either to pay the price differential between the generic and the trade-name drug or to pay a higher copayment. In addition to these regulations on generic substitution by pharmacists, HMOs may alter physicians' prescription behavior by giving them more information about pharmaceutical options and by providing incentives to prescribe lower-cost drugs. This is discussed in more detail in Section 6.

[9] *This point was also made in passing by Arrow (1963).*

[10] The data on private insurance include the 14% of individuals covered by HMOs.

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