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Regulation and competition in the Taiwanese pharmaceutical market under national health insurance

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ABSTRACT

This article investigates the determinants of the prices of pharmaceuticals and their impact on the demand for prescription drugs in the context of Taiwan's pharmaceutical market where medical providers earn profit directly from prescribing and dispensing drugs. Based on product-level data, we find evidence that the profit-seeking behavior of the medical providers in the prescription drug market transfers the force of competition from the unregulated wholesale market to the regulated retail market and hence market competition still plays an important role in the determination of the regulated price. We also find that the profit-seeking behavior plays a similar role to advertising in that it increases the brand loyalty and hence lowers price elasticity. An important implication of our study is that the institutional features in the pharmaceutical market matter in shaping the nature of pharmaceutical competition and the responsiveness of pharmaceutical consumption with respect to changes in price.

1. Introduction

In recent years, a substantial amount of technological progress in medicine has taken the form of pharmaceutical innovation. As a result, an increasing number of studies have paid attention to how the pharmaceutical market operates in the health sector (Berndt, 2002). In particular, the determinants of the prices of pharmaceuticals and their effects on the demand for prescription drugs have long been a focus in this line of research (see, e.g., Berndt et al., 1995; Ellison et al., 1997; Lu and Comanor, 1998; Rizzo, 1999; Danzon and Chao, 2000; Pavcnik, 2002; Ekelund and Persson, 2003; Wang, 2006; Dalen et al., 2006; Iizuka, 2007; Ellison and Snyder, 2010). However, most of these studies used data obtained from Western countries where prescribing and dispensing are separated. The experiences of East Asian countries where physicians prescribe and dispense drugs are much less well researched. A few exceptions include Wang (2006) and Iizuka (2007) who target their research on the pharmaceutical markets in China and Japan, respectively.

Compared to other markets in the economic sector in general and in the health sector in particular, study outcomes of the pharmaceutical market are more likely to be sensitive to the institutional features because of the complex institutional context in this market (Reinhardt, 2007). In many countries, governments provide insurance coverage for prescription drugs and regulate the prices that they reimburse. In addition, physicians act as front-line professional agents, making consumption decisions on behalf of their patients in the prescription drug market. Instead of a simple bilateral relationship between demand (the buyer) and supply (the seller), these characteristics shape the structure of the prescription drug market in a quadrilateral relationship: the pharmaceutical firm, the medical provider, the patient and the payer. Whether or not the study outcomes on the determinants of prices and their effects on the demand for prescription drugs are sensitive to the alternative structures of this quadrilateral relationship is an issue that is well worth exploring.

This article uses the prescription drug market in Taiwan as an example to investigate the question of how the institutional features of the health sector affect the determinants of price and quantity in the pharmaceutical market. In Taiwan, the government provides universal insurance coverage for prescription drugs and regulates the reimbursement price. In addition, physicians both

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prescribe and dispense drugs. As a result, Taiwan's pharmaceutical market provides an interesting setting in which to address the following two questions: (1) Compared to the system where prescribing and dispensing are separated, does the integration of prescribing and dispensing alter the form of price competition in the pharmaceutical market, and how does it do so? (2) How is the price elasticity of demand for prescription drugs influenced by institutional features such as the integration of prescribing and dispensing?

The remainder of this article is organized as follows. Section 2 describes the conceptual framework that is based on the institutional features of the prescription drug market in Taiwan. Section 3 describes the data and methodology used in the analysis. Section 4 presents the results, and Section 5 summarizes our findings and discusses policy implications.

2. Conceptual framework

There are two major institutional features in the Taiwanese pharmaceutical market that make our study setting different from other existing studies which focus on countries in North America and Europe.

First, Taiwan, like many Asian countries such as China and Japan, has a health-care system in which physicians both prescribe and dispense drugs.[1] Under this system, most patients directly receive their outpatient care prescription drugs from the hospitals or clinics that they visit. Second, Taiwan has a social insurance system, known as national health insurance (NHI), which provides universal insurance coverage to all citizens and offers comprehensive benefits, including physician services, hospital care, and prescription drugs. To control the cost of public insurance, the government regulates the reimbursement price of prescription drugs (P), i.e., the price paid on behalf of patients, in the retail market, but it does not regulate the acquisition prices (P_a) that hospitals or clinics obtain from the pharmaceutical manufacturers in the wholesale market. That is, the government regulates public prices only and leaves distribution margins ($P - P_a$) unregulated. These two institutional features together enable clinics and hospitals to profit from the sales of prescription drugs.[2]

We first describe how the regulated prices are set. Then, we explain how the profit margins between the reimbursement and the acquisition prices affect the demand for prescription drugs.

2.1. The determinants of the regulated price

In addition to obtaining authorization to market a new drug, Taiwan, like other countries with direct price controls on pharmaceutical products, requires that the pharmaceutical manufacturer of a new drug obtain approval for coverage and a price for reimbursement from the single public payer, the Bureau of National Health Insurance (BNHI).

At the time of entry, the public payer (BNHI) uses a mix of strategies to determine the reimbursement price (or referring to as the launch price) for each specific brand-name and generic drug, including references to existing products and to international comparisons, and a drug's therapeutic value. In general, the public payer fixes the regulated price product by product and the level of the regulated price is positively associated with the therapeutic value and the version of drugs according to the following four specific criteria.[3] First, BNHI uses the median price of international comparisons (P_{IM}) to set the upper limit on regulated prices for branded drugs still on patent (P_b^{on}), that is, $P_b^{on} \leq P_{IM}$.[4] Second, for off-patent branded drugs, the upper limit of the regulated price is 85% of the international median price, that is, $P_b^{off} \leq 0.85P_{IM}$. Third, for generic drugs that have passed a bio-equivalent test (P_g^{be}), the upper limit of the regulated price is the price of the branded price in the same therapeutic group, that is, $P_g^{be} \leq P_b^{off}$. Fourth, for generic drugs for which a bio-equivalence test is not conducted, the upper limit of the regulated price is 80% of the price of the branded drugs in the same therapeutic group, that is, $P_g \leq 0.8P_b^{off}$ (Hsieh and Sloan, 2008).[5] Based on this practice, the determinant of the launch price (P) can be expressed as follows:

$$P = P(V,\ P_o), \tag{1}$$

where V represents the version and the therapeutic value of the product, P_o represents the price of other existing competing products in the same therapeutic category.[6] Equation (1) states that the public payer considers the therapeutic value and the price of other existing products when setting the regulated price for each product at the time of entry.[7]

Following entry into the market, the public payer uses a market survey on the prices and quantities of sales in the wholesale market as the basis for updating the reimbursement prices for existing drugs. As mentioned, the government only regulates the reimbursement price (the retail price) and does not regulate the wholesale price based on which the clinics and hospitals purchase

[1] In recent years, the government in Taiwan has adopted a series of reforms to separate drug prescribing from dispensing (Chou et al., 2003). However, the reforms have been incomplete in the sense that hospitals can still keep their pharmacy department for outpatient services and physicians practicing in clinics are still allowed to hire pharmacists on site to dispense drugs. Japan and South Korea have also adopted similar reforms to separate drug prescribing from dispensing; see Iizuka (2007) and Kwon (2003). For a more detailed analysis on the historical background of the integration of drug prescribing and dispensing in East Asian countries, see Eggleston and Yang (2009). In Switzerland, physician dispensing is also allowed in some regions where the density of pharmacies is lower (Rischatsch and Trottmann, 2009).

[2] Throughout this paper, the reimbursement price is equivalent to the retail price which is regulated by the public payer and the acquisition price is equivalent to the wholesale price which is unregulated. Thus, in our paper, the terms reimbursement price, retail price and regulated price are interchangeable. Similarly, the terms acquisition price, wholesale price and unregulated price are interchangeable.

[3] In other words, Taiwan has not imposed a referencing price system as adopted in many European countries whereby pharmaceutical manufactures are allowed to have certain range of freedom to set their own retail prices. In Taiwan, the public payer sets the retail price for each individual drug on the basis of "product brand" instead of the "chemical substance". For generic drugs, this is the so-called "branded generics".

[4] The BNHI monitors 10 countries as a reference group for international comparisons, including Australia, Belgium, Canada, France, Germany, Japan, Sweden, Switzerland, the United Kingdom, and the United States.

[5] For more detailed information on the practicing rule of regulation on pharmaceutical prices in Taiwan, see the website of the Bureau of National Health Insurance (http://www.nhi.gov.tw/english/index.asp).

[6] As noted, the median price of international comparisons (P_{IM}) serves as the benchmark or reference point to set the launch prices for brand-name drugs, which in turn provide the reference point for determining the launch prices for generic drugs. Based on this recursive relationship, the effect of P_{IM} is incorporated in the price of other existing competing products (P_o). In addition, P_{IM} is only relevant to the determination of the launch prices for brand-name drugs which only account for 16% of pharmaceutical products selected in our sample as we will discuss in the empirical section. Thus, we will use the price of other existing competing products to serve as a proxy variable to capture the effect of P_{IM} in our empirical estimation.

[7] Since the implementation of the NHI program in March 1995, the public payer in Taiwan (BNHI) has established a task force committee, which consists of representatives from medical professionals and government officials, to decide the level of the launch price for each pharmaceutical product entering the NHI formulary. In practice, the public payer gives the committee judging which measures of therapeutic value count a great deal of discretion in making the final decision regarding the launch price and regarding whether or not to set the launch price close or equal to the median prices based on international comparisons. In short, deciding how the drug's therapeutic value is used and how the regulation measures and defines this value are committee-driven.