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# VERTICAL INTEGRATION IN HIGH-TRANSACTION COST SECTORS: THE CASE OF THE BULGARIAN PHARMACEUTICAL INDUSTRY

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## Abstract

*Economic theory provides various explanations for vertical integration but transaction costs seem to be a major determinant of backward, forward and lateral integration. The paper studies integration trends in the newly emerging Bulgarian pharmaceutical sector, seeking transaction cost explanations to the forward integration taking place in it. We hypothesize that asset specificity, above all, determines many of the organizational transformations and adaptations Bulgarian pharmaceutical companies are undergoing. Having special attributes, their products and assets seem to favor a larger size of the companies. Furthermore, as a low-trust, high-transaction cost economy, the Bulgarian economy dictates that a larger scale of operations be internalised within firms rather than carried out by the market.<sup>1</sup>*

**Keywords:** Vertical integration, transaction costs, asset specificity, distribution

**JEL Classification:** L42, I11, D86, D23

## 1. Introduction

It is commonly believed that vertical integration is an attempt to create monopoly and to seek rents. Monopoly theories of vertical integration explain it as the instrument of price discrimination and the creation of entry barriers. Alternatively, economic theory justifies integration on the grounds of efficiency achieved through greater economies of scale and scope resulting from mergers. Chandler (1966) maintains that when economies of scope between successive stages due to technological organizational interrelationships are strong enough, these activities should be provided under joint ownership. Such beliefs serve as the ground for the technological determinism behind vertical integration. Other explanations of vertical integration have been the avoidance of factor distortions in monopolized markets (Vernon, and Graham 1971; Schmalensee 1973; Warren-Boulton 1974) or the transfer of risk from one sector of the economy to another (Carlton 1979). In addition, some scholars emphasize that vertical integration can be an organizational form used to avoid taxes on intermediate products (Stigler 1951). In the context of transfer pricing and multinational corporations, vertical integration can be seen as a device to take advantage of the different treatment that national laws and tariff codes provide to the exports of products. Those exports may be treated differently within the boundaries of the firm and through interfirm exchange where intrafirm trade may be favored.

While all of the above might partly be reasons for vertical integration, transaction costs seem to be a chief determinant of vertical integration. The paper studies integration trends and gives transaction cost explanations to the recent developments in the newly emerging Bulgarian

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pharmaceutical sector. We try to show that asset specificity affects many of the organizational transformations and adaptations Bulgarian companies in the sector are undergoing. Their products and assets have special attributes that determine a larger size of the companies. Furthermore, being a low-trust, high-transaction cost economy, the Bulgarian economy dictates that a larger scale of operations be internalised within firms rather than carried out by the market. Thus, in their dilemma to make-or-buy, given the high market transaction costs in the country, pharmaceutical firms opt to make, rather than buy, which is a possible explanation for the forward integration trends.

The structure of the paper is as follows: part 1 is an introduction. Part 2 discusses the institutional approach to the study of vertical integration stressing the transaction cost perspective. Part 3 presents the Bulgarian pharmaceutical sector as one of high asset specificity and a possible host for vertical integration. Part 4 examines the potential for empirical research. The paper ends with conclusions.

## **2. Transaction cost economizing effects of vertical integration**

Scholars who question the technological origins of vertical integration adopt an institutional approach to explaining vertical mergers<sup>2</sup>. According to Williamson (1985, p. 87) decisions to integrate are rarely due to technological determinism and technology is fully determinative of economic organization only if 1) there is a single technology, which is strictly superior to all others, and 2) that technology requires a unique organizational form. As there is rarely one single feasible technology and technology hardly determines the choice among alternative organizational forms, vertical integration does not stem from technological reasons, neither from monopoly considerations (Williamson 1983, p. 614).

A subgroup of scholars see information as the root of vertical integration, where there is uncertainty in the supply of the upstream good with the consequent need for information by downstream firms (Arrow 1975, 1985) or vertical integration is the product of information externalities (Green 1984). Grossman and Hart (1986, 1987) developed a theory of vertical integration and ownership based on the concept of contractual incompleteness due to asymmetric information between the parties to the contract and outsiders. They do not distinguish between ownership and control and define ownership as a power to exercise control. Barzel (1982) and North (1978) trace vertical integration to difficulties in measurement. Barzel views vertical integration as a means to economize on measurement costs. Firms integrate when measurement of contractual output is difficult and tend to remain independent and trade with each other when output can be measured easily. Barzel (1982, p. 42) stresses that ownership will change more frequently the less the commodity is subject to change. Being non-durable products and subject to change, medical drugs would change ownership less often than some other products.

Williamson (1985, p. 86) traces the roots of vertical integration to transaction costs and the condition of asset specificity. Transactions accompanied by investments in durable, transaction-specific assets experience "lock in" effects, which is why market exchange by autonomous entities is substituted by unified ownership. Asset specificity arises in relation to special purpose investments that are more risky than general purpose investments because specialized assets cannot find alternative uses without some sacrifice of productive value if contracts are interrupted or terminated earlier. Specificity seems to be higher with fixed costs than with variable costs and takes several different forms: site specificity, physical asset specificity, human asset specificity, dedicated assets and brand name capital. Site specificity is a unique feature of assets located at

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<sup>2</sup> Ours is not a comprehensive study of the literature on vertical integration.

the same place so that to economize on transportation costs. Physical asset specificity refers to investment in specialized physical capital, the value of which is much smaller in alternative uses than the specific transaction for which it has been intended. Examples of transaction specific human capital investments are specialized training, learning-by-doing economies or team tasks in production operations. Dedicated assets are an investment in generalized production aimed at selling a significant amount of product to a specific customer. Brand name capital represents investment in brand name. Since pharmaceutical producers invest heavily in branded drugs, those drugs represent brand name capital and specific assets to them.

Vertical integration will play a role with high asset specificity. It will not be observed in the neoclassical transaction case where “faceless buyers and sellers ... meet ... for an instant to exchange standardized goods at equilibrium prices” (Ben Porath 1980, p. 4). Asset specificity matters for organizational form when it is combined with bounded rationality, opportunism and uncertainty. Bounded rationality is the rationality of individuals who are “intendedly rational but only limitedly so” (Simon 1961, p. xxiv). It differs from maximizing and organic rationality, the former showing a maximizing orientation in the presence of full information, the latter being one of complete ignorance. Opportunism, on the other hand, is the strongest form of self-interest seeking<sup>3</sup>. It refers to the efforts to hide or distort information, mislead, disguise, obfuscate or confuse. It leads to asymmetric information and behavioral uncertainty in economic transactions. It differs from simple self-interest seeking, which is a semistrong form of self-interest seeking and from obedience, which is equivalent to non-self-interest seeking. In the Bulgarian drug market, bounded rationality, opportunism and uncertainty all take excessive forms. Thus, pharmaceutical producers face excessive opportunism and market uncertainty in their dealings, while their knowledge of the marketplace is far more limited than in other industries. Asset specificity is a factor only with high degree of opportunism. With low opportunism parties are not so vulnerable to the risks of contracting which is illustrated by Table 1. Since opportunism is high in the Bulgarian conditions and pharmaceutical firms offer branded products that represent a form of specific assets, their choice would be geared toward the firm, rather than the market.

**Table 1.** Choice of market versus firm contracting

		<b>Asset Specificity</b>	
		Low	High
<b>Opportunism</b>	Low	Market	Market
	High	Market	Firm

The incentives for vertical integration strengthen, as transactions take on a more specialized character. As assets become more specific to a single use and, therefore, are less transferable to other uses, parties become more open to opportunism and require the special protection that integration can supply. “Unified governance” then takes the place of market governance, which is the prevailing mode of occasional and recurrent contracting with non-specific investment. Williamson (1985, p. 78) predicts that price and quantity adjustments will be more complete in vertically integrated enterprises than in interfirm trading.

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<sup>3</sup> Williamson (1985, p. 47) defines opportunism as “self-interest seeking with guile. This includes but is scarcely limited to more blatant forms, such as lying, stealing, and cheating. Opportunism more often involves subtle forms of deceit. Both active and passive forms and both *ex ante* and *ex post* types are included.”

Vertical integration has been described as the “make-or-buy” paradigm of transaction cost economics.<sup>4</sup> Monteverde and Teece (1982) provided one of the first empirical studies giving a contractual interpretation of vertical integration. They examine the effects of asset specificity defined as worker-specific knowledge on the decisions to produce components or to obtain them from outside suppliers. Their findings support the transaction cost paradigm formulated by Williamson. In a study on the procurement practices in the aerospace industry Masten (1984) examines both asset specificity and product complexity as determinants of vertical integration. Empirical studies seem to put less emphasis on forward integration into marketing and distribution. In an earlier study Lilien (1979) models a company’s use of captive (direct) channels versus independent (indirect) channels for a product line. He finds that captive channels appear with larger firms, larger average orders, and more complex products. Anderson and Schmittlein (1984) examine human asset specificity as a factor for vertical integration in the electronics industry. Anderson (1985) develops a model of when the selling function in a district is performed by employees rather than by outside agents. Her main findings are that the greater combination of transaction-specific assets and environmental unpredictability leads to greater likelihood of integration and that unpredictability alone does not have an impact on the use of direct salespeople. John and Weitz (1988) also find that firms are less likely to use reseller channels when specific asset levels are higher. In their study on the carbonated soft drink industry Muris, Scheffman and Spiller (1992) attribute the move from independent bottlers to captive (integrated) bottling to changes in asset specificity.

What should be taken into account are not just the bureaucratic costs of governance but also the production costs. Williamson emphasizes that when asset specificity is low market contracting between successive production stages has good economizing properties because the governance costs of market procurement are small and production economies can be achieved. As asset specificity increases, vertical integration is the preferred mode of economic organization (Williamson 1985, p. 90). We can extend this analysis to the individual firm’s profit. Let the firm choose between two modes of procuring a good. One is the option to make the good to one’s own requirement and another is to procure it from the market. If we assume that the firm sells its output  $q$  at a particular price  $p$ , we can treat revenues as constant in both cases and independent of the asset specificity  $k$ <sup>5</sup>. Let the profit of buying the item on the market be a function of the asset specificity such that

$$\pi_M(k) = pq - C_M(k) - M(k) \quad (1) \quad \frac{\partial C_M}{\partial k} > 0 \quad \frac{\partial M}{\partial k} > 0$$

where  $C_M(k)$  are the production costs when the item is procured through the market and  $M(k)$  are the governance costs. Asset specificity increases the production and governance costs of market contracting so we have  $\frac{\partial C_M}{\partial k} > 0$  and  $\frac{\partial M}{\partial k} > 0$ . Furthermore, let the profit of the firm when producing the item be:

$$\pi_\beta(k) = pq - C_\beta(k) - \beta(k) \quad (2) \quad \frac{\partial C_\beta}{\partial k} < 0 \quad \frac{\partial \beta}{\partial k} < 0$$

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<sup>4</sup> For a more thorough review of the empirical literature see Shelanski and Klein (1999).

<sup>5</sup> Following Williamson’s notation.

where  $C_\beta(k)$  and  $\beta(k)$  are the production and governance costs of producing the item to one's own requirements, respectively. As asset specificity favors internal governance, both the production and the governance costs of making decrease with asset specificity and  $\frac{\partial C_\beta}{\partial k} < 0$ , and  $\frac{\partial \beta}{\partial k} < 0$ . Subtracting equations (1) and (2) we obtain

$$\pi_M(k) - \pi_\beta(k) = C_\beta(k) - C_M(k) + \beta(k) - M(k) = \Delta C + \Delta G$$

where we set  $C_\beta(k) - C_M(k) = \Delta C$  and  $\beta(k) - M(k) = \Delta G$ . According to Williamson (1985, p. 92)  $\Delta C$  shows the steady state production cost difference between producing to one's own requirements and the steady state cost of procuring the same item on the market. On the other hand,  $\Delta G$  is the difference in governance costs, i.e., between the bureaucratic costs of internal governance and the corresponding governance costs of markets. In Williamson's model the difference  $\Delta C + \Delta G$  falls with asset specificity, as shown in Figure 1.

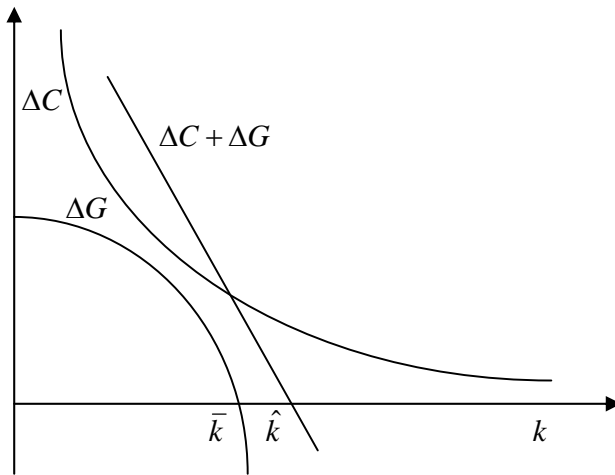


Figure 1. Comparative production and governance costs

Source: Williamson 1985, p. 93

The result  $\pi_M(k) - \pi_\beta(k) = \Delta C + \Delta G$  is depicted in Figure 1. We can review three situations:

1.  $\pi_M(k) - \pi_\beta(k) = \Delta C + \Delta G > 0$

The difference in total costs  $\Delta C + \Delta G$  lies above the horizontal axis, which implies that the firm would achieve a greater profit by buying the item from the market rather than producing it. What we observe in this case is that the firm's profit is a direct function of asset specificity where for low values of asset specificity below a critical value  $\hat{k}$  buying the item promises greater returns than making it in the make-or-buy decision.

$$2. \pi_M(k) - \pi_\beta(k) = \Delta C + \Delta G = 0$$

This is the point of indifference where some particular asset specificity  $\hat{k}$  yields the same profits within and outside the firm. It is irrelevant to the firm which mode of procuring the item it would choose – to make or to buy it.

$$3. \pi_M(k) - \pi_\beta(k) = \Delta C + \Delta G < 0$$

For a very high asset specificity where actual asset specificity exceeds the critical value  $\hat{k}$  the profit of making the item exceeds that of buying it on the market. Profitability of producing to one's own requirements increases with asset specificity, while that of buying from the market decreases. We can demonstrate the effect of asset specificity on individual profits with the help of differentiation

$$\frac{\partial \pi_M}{\partial k} = -\frac{\partial C_M}{\partial k} - \frac{\partial M}{\partial k} < 0$$

As both partial derivatives on the right are positive, profitability of obtaining the item through the market falls with the increase in asset specificity. Asset specificity does not favor market procurement.

$$\frac{\partial \pi_\beta}{\partial k} = -\frac{\partial C_\beta}{\partial k} - \frac{\partial \beta}{\partial k} > 0$$

The effect of asset specificity on the profit of producing the item is positive which implies that asset specificity favors own production. This conclusion follows from the fact that the two partial derivatives on the right are negative. As an industry matures, the uncertainty in it decreases and the benefits that accrue to vertical integration presumably decline. This means that vertical integration would mostly be observed in relatively new industries and in sectors producing new products. Thus, the emerging pharmaceutical sector in Bulgaria appears to be a good host for vertical integration. Larger firms will be more integrated into components than smaller ones, *ceteris paribus*. A multidivisional form firm will be more integrated than a unitary form firm, *ceteris paribus*.

Integration of peripheral activities includes backward integration into basic materials, lateral integration into components and forward integration into distribution. Forward integration into wholesaling is observed for products that need coordination of marketing and distribution, where branding is practiced or products require special handling. For products and industries where product differentiation is essential the need for proper advertising as part of the promotion mix also determines ownership of wholesaling. The Bulgarian market for medicines is an example of such an industry. Forward integration into retailing extends the case of ownership of distribution where special handling and proper representation of the product continue to be important to the sales of the product. Products that are not long lasting often require such special handling. Products that require information, special demonstration or proper display also determine the ownership of retail stores. Furthermore, the Bulgarian pharmaceutical sector attempts to integrate forward, as medicines require sufficient information to be given to consumers.

In the conditions of high transaction costs asset specificity plays a major role in shaping the structure of the economy. In transitional countries like Bulgaria it could be expected that basic industries will evolve due to excessive opportunism. Sophisticated and complex industries will not advance because of the additional transaction costs that the hold-up problem brings. Firms in Bulgaria will be less likely to trade with sophisticated assets, as they will be exposed to the additional risks of costly bargaining. Basic products would be sold. Management would generally be less competent and skilful and would perform mostly non-specific, standard tasks. Workers will also tend to have very general skills. They will not specialize and invest in firm-specific human capital. For that reason, labor turnover is expected to be high and the effects of learning by doing to be insignificant. In the conditions of costly bargaining, firms will avoid specific assets or will tend to integrate vertically. Non-specific assets would be the preferable mode, as they allow greater reliance on competitive resource allocation and a particular supplier or buyer can easily be replaced with another one. Finally, there would be a greater tendency for large firms to appear in high transaction costs (expensive) markets, which determines strong integration trends in the Bulgarian pharmaceutical industry.

### **3. The Bulgarian pharmaceutical sector**

Pharmacy chains hold about one fourth of the retail drug market in Bulgaria. According to IMS Health, the largest international agency researching pharmaceutical markets, they hold 25% of the market in value terms, while others estimate their market share to be between 20 and 30%, which is the equivalent of 186 and 289 million leva (Nikolova 2005, 6). The number of pharmacies grew from 4000 in 2003 to 4518 in 2004. This shows too many players on a relatively small market. The drug market is expanding and the turnover of all pharmacies increased 15% from 800 million leva in 2003 to 927 million leva in 2004. There are limits to growth, though, as the total number of pharmacists in Bulgaria is 5400, which is the maximum number of licenses that can be obtained. Of all 460 registered wholesalers only 80 are operative. Some believe that there is room for five distributors on the market at the national level, some 10-12 on a regional level, while the number of pharmacies should be half of what it is (Nikolova 2005, 4).

While the Bulgarian population is decreasing, it is demanding more and more sophisticated medicines. Consumers seek medical drugs not only when they are ill, but also when they need better quality and a healthy life. They have higher expectations not only in terms of drugs but also in terms of additional products pharmacies sell such as cosmetics, food additives (vitamins), medical supplies, etc. Customers seek good service, advice, product variety, etc. An exemplary outlet is one, which is fully computerized, has a list of all necessary items, several knowledgeable pharmacists and is usually owned by a large chain. Other considerations are price and geographical proximity. Bulgarian consumers prefer to have their medicines sold at a hand distance.

Profitability in the sector is low. Only half of the pharmacies are profitable. The interfirm indebtedness in the sector reached 500 million leva in the end of 2004. The financial burden falls on distributors while hospitals and part of the pharmacies instead of paying for the drugs received on consignment from one wholesaler approach another wholesaler. Indebtedness in the sector seems to hurt producers the most. Unable to control financial flows and the proper sale of medical drugs they lose profits and encounter high contractual opportunism. The mechanism of consignment does not affect wholesalers and retailers, as they do not invest real capital in the distribution but their losses are rather transferred onto producers who do not receive their payments.



The government controls the distribution of drugs in that the producer sets a particular price and the Health Ministry determines a maximum retail threshold on that price. The presence of multiple layers in the distribution boosts the final price paid by the consumer. Wholesalers and retailers turn out to act only as redistributors. The Bulgarian Health Law does not treat pharmacy chains. According to the Law licenses are issued only to holders of a master's degree in pharmacy. It does not treat the ownership, neither the relationship of the owner with the license holder.

The most famous chains in the country are Sanita Franchise (60 outlets), Seyba (110), Sofia Pharmacies (56) and Exemplary Pharmacies (170). There are two major types of pharmacy chains, known as "long" and "short" chains. The short chains are regional groupings of two, three to five outlets that have been formed after the privatisation of the former state-owned pharmacy companies. Some of the more famous short chains include Mareshki for Northeast Bulgaria, Municipal Pharmacies in Burgas, Interpharma in Stara Zagora, Multipharma in Yambol, etc. The long chains, on the other hand, are franchised under the same trade name. They represent some major investors, producers and wholesale distributors of medicines. Although vertical integration is illegal, a process of consolidation takes place that gives advantages to big market participants. Small pharmacy stores try to stay competitive by violating the rules of honest competition and good customer service. Large pharmacy chains offer big discounts on which small independent outlets cannot compete. At the same time, small pharmacies and independent distributors increase the price of the final good substantially – manufacturers receive only 53% of the final price, the rest being wasted along the distribution channel. Competition takes place on the basis of discounts and not so much on quality of service. As to location, most of the big chains seem to have established themselves in the bigger cities while operating in small towns and villages seems unprofitable. Integration cannot likely affect small family-type pharmacies in small towns, as they do not have competition. Rather, it will reduce the number of pharmacies in the big cities.

There are three leading local drug manufacturers: Actavis, Sopharma and Chaika Pharma. While Actavis and Sopharma emerged from the former Bulgarian pharmaceutical companies Balkanpharma and Sopharma after their privatization and restructuring, Chaika Pharma is a new firm established and licensed in 2000. Drug manufacturers insist on the need for full vertical integration along the channel producer-distributor-pharmacy chain. Since the Law on Medical Drugs only allows producers to acquire wholesalers but not retailers, producers secretly develop franchising schemes that do not include direct ownership of retail outlets but de facto allow controlling the financial and commodity flows. Thus, despite the law Sopharma and Chaika Pharma are fully vertically integrated structures and Actavis has attempted to follow with the acquisition of the Hygia distributor.

A second group, that of the independent distributors, does not plan on vertical integration and the acquisition of downstream firms. Phoenix's Lybra and the independent distributor Sting oppose the liberalization and legalization of vertical integration. Through Lybra the Pan-European distributor Phoenix would enter the Bulgarian insulin market thus threatening Tradeconsult, a major distributor of insulin. The three independent national distributors are Sting, Biomeda, and Tradeconsult.

The Law on Medical Drugs prohibits vertical integration along the producer-wholesaler-pharmacy chain. It permits integration only between producer and wholesaler. Drug manufacturers and wholesalers can neither own pharmacies, nor participate in companies, which own pharmacies. Manufacturers cannot own firms that trade with drugs other than their own. An amendment to the Law on Medical Drugs was adopted in May, 2005 prohibiting the participation of manufacturers in wholesaling as well as of wholesalers in manufacturing thus banning effectively the mergers of producers and wholesalers. The aim of the amendment was to block the process of

consolidation taking place in the pharmaceutical market and, in particular, vertical integration. Examples of manufacturers related to wholesalers are Sopharma to Sanita and Chaikapharma to Commercial League.

A new law on medicines is to be adopted regulating the distance between two pharmacies, the per capita number of pharmacies, the number of pharmacists per outlet, the product base and the technical equipment. The current Law on Medical Drugs allows pharmacies to sell only medicines, cosmetic, and sanitary products. There is a debate about the sale of vitamins, which are considered food additives but are effectively sold in pharmacies. The new law will be a follow-up to regulations in the European Union, as Bulgaria joined the EU in January 2007. Some countries in the EU permit vertical integration between manufacturers and distributors and others do not but the common trend seems to be the move toward chains and greater liberalization. Bulgaria's acceptance into the EU requires distributors and pharmacies to have certificates of good distribution and pharmacy practice and will impose regulations that a number of participants will not be able to abide by. The Bulgarian Parliament, which has the legislative power, is strongly influenced by the lobby of the small, family-type pharmacies. The debate about whether there should be vertical integration continues whereas politicians, health authorities and small businessmen oppose vertical integration on the grounds that it is a potential for monopoly. Foreign companies importing drugs through wholesalers believe there should be a public debate on vertical integration.

The opposition to vertical integration in the pharmaceutical sector goes back to the year 2000 when Commercial League, a leading distributor, attempted to build up a plant for the production of life-saving and life-maintaining medicines such as infusion solutions and amino-acids used in pre-hospital and hospital treatment. Such products find good application in emergency care where quality of early treatment is crucial for overall treatment and insures cost savings. The project developed jointly with the Austrian firm Austroplan would represent a total investment of 46 million deutsche marks. Commercial League has 70 consignment storage houses in Bulgaria but also owns a tablet packaging plant in the city of Varna, at least two pharmacy chains (a total of 30 to 60 outlets) and the Pharmatel Company for door-to-door sales (Alexandrova 2000). The charges against Commercial League were that it would not allow competitive products to be sold in its outlets thus limiting product variety and consumer choice. The other distributors and producers which were not vertically integrated would be at a disadvantage, as vertically integrated structures along the production, wholesale and retail sale of drugs allow achieving a high profit margin. The Law on Medical Drugs stated that vertical integration threatens competition.

Meanwhile, the Executive Agency on Medical Drugs has reported a large number of violations of good commercial practices in pharmacies. Twenty-one of them worked without license in 2004. Small pharmacies often do not store thermo-sensitive drugs properly. Sometimes toxic substances are kept together with all other drugs in the main premise of the pharmacy. A major violation of the regulations on the proper storage of drugs is that narcotics are not kept in special metal cases but are available in the main premise of the pharmacy. There are multiple occasions of storage and sale of medicines beyond their expiration date. The pharmacies continue to sell a large number of medicines, which, for one reason or another, have been banned from sale. Many of the items lack instructions for use in Bulgarian. Assistant pharmacists sell prescribed medicines to patients, which also contradicts the law. A number of medicines are sold without the necessary sale authorization or without the accompanying accounting documents. Very often nonexperts operate in the pharmacies. Small, independent pharmacies resort to unfair competition to survive.

Producers cannot control the way their products are sold, displayed or promoted. To circumvent the legal ban on vertical integration they register themselves by legal entities, their

distributor by other entities, while pharmacies are registered by individual pharmacies. Such is the connection between the Chaika Pharma production plant, its distributor Commercial League and the Exemplary Pharmacies chain (See Table 2).

**Table 2.** Vertically integrated structures in the Bulgarian pharmaceutical sector

<b>Drug Manufacturer</b>	<b>Wholesaler</b>	<b>Retailing</b>
Sopharma	Sopharma Trading	Yes, through Sanita Franchise
Actavis	Hygia	No, attempted through Mareshki Pharmacies
Chaika Pharma	Commercial League	Yes, through Exemplary Pharmacies and Pharmatel, attempted Sofia Pharmacies

Table 2 presents the vertically integrated structures in the Bulgarian pharmaceutical industry where each major drug producer has integrated with a wholesaler. Sopharma and Chaika Pharma are already fully vertically integrated, as shown by Table 2. Sopharma owns Sanita Pharmacies through the Sopharma Trading Holding, while Chaika Pharma owns Exemplary Pharmacies and Pharmatel for door-to-door sales through Commercial League, which also attempted to obtain Sofia Pharmacies. Actavis has attempted to buy out the Mareshki Pharmacies through its distributor Hygia but has not succeeded.

Sopharma is a major pharmaceutical company in Bulgaria concentrating in research, manufacturing and trade in proprietary pharmaceutical substances, phytochemical products and finished drug forms. In the beginning of 2005 the company appropriated shares in a number of pharmacy chains, particularly, 9.99% of Kaliman, 9 shares of Global Medical and 9.99% of Sanita Trading. These are three of the largest wholesalers in the country. The goal was to restructure the Bulgarian pharmaceutical market. Sopharma has been able to protect its branded products and achieve a high degree of profitability through the pursued strategy of vertical integration. The major wholesalers for Sopharma are Sanita Trading, Commercial League, Hygia, Sting, S&D Pharma, Global Medical, Kaliman, Unipharma 2000, Coral, Plamar, Biopharmacy, Multipharm. The new management of the company reduced the copying of trademarks owned by the company and stabilized it financially. The cost reductions resulted from economies on raw material costs, financial costs as well as costs of exchange rate operations.

In 1999 the Icelandic company Actavis invested in the Bulgarian Balkanpharma plant and privatized in the following year the three big pharmaceutical plants in Bulgaria's towns Dupnitsa, Troyan and Razgrad. An attempt of the company to vertically integrate was the acquisition of one of the five biggest national distributors in the country Hygia. This was in response to Sopharma's obtaining the three major distributors Sanita Trading, Kaliman and Konsumpharm that formed the holding Sopharma Trading. It also followed the purchase of another leading distributor Lybra by the Pan-European distributor Phoenix and the control of Chaika Pharma, the third major drug manufacturer in Bulgaria, over one of the largest wholesalers Commercial League. The price of 33 million leva that Actavis was ready to pay for Hygia was not announced officially as the finalization of the deal was subject to the approval of the Commission for Protecting Competition (CPC). The approval would depend on whether Hygia had a monopoly position on the market. Hygia had been active since 1995 and had 9 storage houses in the country. It was a major supplier for the hospitals, the Ministry of Health and the National Health Case in public procurement.

The process of concentration seems to follow world trends where both horizontal and vertical integration occurs, i.e., mergers of producers as well as mergers of producers and

distributors.<sup>6</sup> Except economies of scale and transaction cost economies consolidation is driven by the need to generate funds for expensive research in the field of genetics, molecular biology, pharmacology, medicine, etc. Some of the most notable world mergers in the last years have been those between British Glaxo and Wellcome into Glaxo-Wellcome and the Swiss Ciba and Sandoz into Novartis, as well as the failed mergers between Smith Kline Beecham Plc. and American Home Products Co. and later Glaxo Wellcome.

#### 4. Potential for empirical research

We have shown that profitability of own production (through vertically integrated structures) increases with asset specificity while that of procuring the products through the market (non-integrated structures) becomes less and less profitable the more specific the assets in question. In the context of Bulgarian pharmaceutical manufacturers and forward integration this finding translates into greater profitability from selling specific medicines carrying the brand name of the manufacturer through its own outlets. In this case, the specific investment made by the company is in brand-name capital, representing a fifth type of asset specificity. At the same time, generic drugs represent a form of non-specific assets that the firm manufactures under a common name. The firm would be likely to use an integrated sales force and own chains of pharmacies when it wants to better display, promote and sell its branded products. This is also in line with the fact that non-integrated pharmacy chains that carry a number of competitive products may not sell those branded drugs in the best way or may even refuse to sell products that go into direct competition with the products of other firms.

It is interesting then to see the effect of drug branding on the profitability of firms. We would also expect it to have an effect on the production and transaction costs of the firm, both of which would be likely to grow the more specific the drug is.

$$\pi_i = \beta_o + \beta_1 D_i + \beta_2 C_i + \beta_3 D_i C_i + \varepsilon_i$$

We can hypothesize an estimation equation where profit is a function of drug branding and total costs such that

$\pi_i$  = profit margin (unit profit) of the  $i^{\text{th}}$  drug;

$D_i$  = 1 if branded drug, 0 if generic;

$C_i$  = unit costs of producing the  $i^{\text{th}}$  drug.

Profit can be taken either as an absolute value, i.e., profit margin, or as a rate of return, that is, a percentage of the total revenue of the company. We expect

$\beta_1 > 0$                       or profit to be higher with drugs that carry the brand name of the company; this would also prove greater profitability of own production with asset specificity.

$\beta_2 < 0$                       higher costs are expected to reduce profit; this would show the combined effect of production and transaction costs.

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<sup>6</sup> In the Bulgarian case Biovet, a major producer of veterinary drugs, is a good example of a horizontally integrated structure pursuing rapid expansion.

$\beta_3 < 0$  an interaction term coefficient that leads to a slope dummy; the implication is that profits would also fall if branded drugs incur higher costs.

To the above variables in the model we can add the sales of the  $i^{\text{th}}$  drug which changes the equation to

$$\pi_i = \beta_o + \beta_1 D_i + \beta_2 C_i + \beta_3 D_i C_i + \beta_4 S_i + \varepsilon_i$$

$S_i$  = sales of the  $i^{\text{th}}$  drug

where we hypothesize that  $\beta_4 < 0$  since with greater sales profit margin is expected to fall. To measure the effect of drug branding on the decision for forward integration we could use a simple contingency table and a chi-square test.

**Table 3.** Contingency table for drug branding versus forward integration

	$B_i = 0$ generic drug	$B_i = 1$ specific drug
$D_i = 0$ non-integrated sales (independent retailers)		
$D_i = 1$ vertical integration (own pharmacies)		

Furthermore, to incorporate other relevant variables we can resort to a binomial probability model. Since a most distinctive form of asset specificity in this case is brand-name capital it is interesting to see the effect of advertising as a form of investment in brand-name capital. Therefore,

$$D_i = f(B_i, A_i) \quad \text{where}$$

$D_i = 1$  if the pharmaceutical manufacturer is vertically integrated with a pharmacy, 0 otherwise;

$B_i = 1$  if the drug carries the brand name of the manufacturer, 0 if it is generic;

$A_i$  = advertising spent on the  $i^{\text{th}}$  drug

Thus we have

$$\ln\left(\frac{D_i}{1-D_i}\right) = \beta_o + \beta_1 B_i + \beta_2 A_i + \varepsilon_i$$

We expect

$\beta_1 > 0$  shows that asset specificity in the form of brand name capital drives forward integration in the Bulgarian pharmaceutical sector;

$\beta_2 > 0$  higher advertising expenditures representing greater investment in brand-name capital also imply greater tendency for forward integration of drug manufacturers with pharmacies.

## 5. Conclusion

Vertical integration allows Bulgarian pharmaceutical firms to achieve scale economies and reduce transaction costs. Operating in a high-transaction cost sector and economy, manufacturers are vulnerable to the risks of market contracting and opportunism from distributors. In their attempt to control products all along the marketing channel, they resort to complex legal and accounting manoeuvres through the mechanism of franchising.

Common ownership guarantees common supply, common advertising strategy, low cost and ultimately, low prices of medications. Vertically integrated structures also provide for full control over the financial flows and the movement of drugs along the distribution chain. Integration into wholesale and retail distribution would allow fair competition and quality commitment. Forward integration into wholesaling is especially important for products that need coordination of marketing and distribution. Such is the case of non-generic (branded) drugs, which require special ways of selling. For products and industries where product differentiation is essential the need for proper advertising as part of the promotion mix also determines ownership of wholesaling, as illustrated by the Bulgarian drug market. Forward integration into retailing extends the case of ownership of distribution where special handling and proper representation of the product continue to be important to the sales of the product. Some solutions and medications are nondurable and require special storage and handling. This also necessitates the common ownership of assets – from the production stage to the sale to the final consumer. The specificity of medicines as intermediate products is very high. They are sophisticated products that require information, special demonstration or proper display. Product specificity opens pharmaceutical firms to various market risks. The need to provide detailed information to consumers also determines the ownership of retail stores by producers and a strongly forward integrated Bulgarian pharmaceutical sector. Furthermore, the freedom of distributors to use pricing strategies that do not quite match the pricing philosophy or requirements of the producers illustrates the hold-up problem where producers do not have choice but to obey distributors.

Some economic theories charge vertical integration with the attempt to create monopoly and seek rents but on the Bulgarian pharmaceutical market the competition on the generic and the original drug market rules out monopoly, as there are several major producers and the sector rather resembles an oligopolistic industry. This excludes the possibility of monopoly-raised production prices. Instead, it could be expected that efficiency and cost savings resulting from vertical integration would likely reduce prices of medicines. Efficiency would stem both from savings in production and transaction costs where we showed that high degree of asset specificity, in this case, the product specificity of medicines, favors internal organization rather than market contracting.

The mechanism of public procurement in Bulgarian healthcare authorizes the Ministry of Health and the Health Case, the central health insurance authority in Bulgaria, to buy medical products for hospitals and clinics. It could be predicted that this process will greatly be facilitated if these central authorities negotiate with integrated companies that control their financial and commodity flows completely and not with multiple layers of distributors. A smooth process of negotiation would be beneficial not only for the authorities but for patients as a whole.

While there are economies of scale and scope resulting from mergers in the Bulgarian pharmaceutical sector, the major driving force behind those mergers seems to be the high asset specificity of products and the sizable transaction costs faced by firms in the low-trust Bulgarian environment. There are transaction cost explanations to the recent developments in the Bulgarian drug industry that Bulgarian economists and policy makers overlook. As a low-trust, high-transaction cost economy, the Bulgarian economy determines that a larger scale of operations in the pharmaceutical sector be internalised within firms rather than carried out by the market.

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