Collusion screening in the Indian pharmaceutical market

A study of possible collusion focused around isosorbide-5-mononitrate.

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Abstract

A means of detecting colluding behaviour by firms using basic and widely available economic data would be an extremely useful tool within the field of economics. In spite of several proposed methods and theories in economic literature cartels are –in practice- only taken down when either it fails internally, leading to one of its members informing authorities or as the result of journalistic investigation. In this paper we make an attempt at using the theories developed by Marshall and Marx (2012) in order to screen the Indian pharmaceutical market for possible colluding behaviour. We focus on a particular group of medicines that lends itself to analysis due to their partial governmental control and choose one medicine for a detailed case study. Although no definitive proof of collusion is obtained from the analysis we do come across a number of abnormalities across the market that we believe make it hard to accept the absence of collusion and/or unethical practices in general as a truthful fact. We present some possibilities for future case studies in light of the same topic.

Introduction

Cartels can have a very large influence on a market. Just this year, European based truck manufacturers have agreed to pay a collective 2.93 billion euros in fines[1]. These fines were imposed by the European commission after word of the cartel had come out. The cartel in question is said to have affected the sales of nine out of every ten trucks in the EU market over a period of fourteen years. Before that there was the LIBOR scandal, where bankers reported false interbank interest rates over a long period (as early as the 90's by some sources) in order for banks to profit on their portfolios, billions of dollars' worth of fines followed[2]. Finally, the EU antitrust commission imposed 1.47 billion euros in fines on members of a CRT cartel[3] (cathode-ray-tubes), another worldwide cartel that involved the price fixing of important components of TV screens and computer monitors between 1996 and 2006. These are just three cases from the last five years in which illegal collusion has been detected and proven, the true extent of cartel formations is unknown. The height of the fines reflect the negative impact that cartels have on the market, being able to detect cartels is therefore a bit of a 'golden goose' for antitrust commissions. Finding them appears to be troublesome though, of the three examples listed above, two were 'detected' because one or more of the cartel members got cold feet and reported the cartel to authorities in hopes of escaping prosecution and gaining immunity from fines. Only the LIBOR scandal featured an empirical research paper by Snider and Youle (2010), two economics professors who showed that the posted LIBOR rates were inconsistent with observable costs and were clustered around certain points when they shouldn't have been. Even

[1] http://www.seattletimes.com/business/truckmakers-includng-paccar-get-record-324-billion-eu-fine-for-price-fixing/ ; http://www.bloomberg.com/news/articles/2016-07-19/truckmakers-fined-record-3-24-billion-by-eu-for-price-fixing

[2] https://en.wikipedia.org/wiki/Libor_scandal#Fines_for_manipulation

[3] http://europa.eu/rapid/press-release_IP-12-1317_nl.htm

this cartel however was initially brought under the radar, not by the examination of economic evidence and data, but by an article in the Wall Street Journal in 2008[4]. The use of financial data to detect signs of collusion is –unfortunately- not something that is being worked on a lot. Given the enormity of the impact that large cartels can have on a market, as is highlighted by the large fines cartel members tend to face, we think that this field should receive more attention. This paper will start with an overview of theory regarding the detection, nature and effects of collusion, followed by a historical overview of the Indian pharmaceutical market. This should give the reader enough insight into the theoretical groundwork of our research as well as explaining the features of the Indian market that make it particularly interesting for studying. After the theoretical overview we will present our dataset, followed by the development of our hypotheses in the Method section, which also explains our testing procedure in detail. After this, we present the results when applying the method to the entire dataset, followed by our case study into Isosorbide-5-mononitrate, a drug used to lower the blood pressure which stands out from the rest of the dataset and was chosen to be examined in great detail (more on this in the relevant section). Lastly we turn to summary results of the full set of medicines in our dataset, and provide possible avenues for future research before turning to discuss the meaning of the results in the conclusion.

Theoretical basis

Earlier work in this area has yielded some theoretical foundation in solving the problem of cartel detection. Abrantes-Metz et al. (2006) conducted a case study centered around the failure of a bidding cartel and found a strong negative relationship between the presence of collusion and price variance, proposing that relatively price variance could be related to collusion in general

[4] http://www.wsj.com/articles/SB121200703762027135

making it possible to screen for it using price data. In this paper we will use some of this work as a collusion detection method and attempt to find suspicious activity in the Indian pharmaceutical market. Bajari & Summers (2002) used a model of competitive bidding to detect collusive behaviour of a few firms who were found to engage in bid-rigging. Their model focuses on two conditions that will be met by the bidding behaviour of a competitive firm, with firms who don't meet these conditions being likely to be engaged in some form of collusion. A more simple method was used by Harrington (2004), who used OLS to compare the behaviour of suspected cartel members with a benchmark, which was known to be competitive. In this paper we will focus on the work of Marshall and Marx (2012). They propose a method in which an investigator focuses on the presence of certain economic characteristics of any given market that should not be observed if the market were completely competitive. These characteristics are coined 'plus factors' and –for the purpose of explaining them easily- we will compare them here to witnesses testifying before court. The reason we draw this comparison is the fact that these plus factors in isolation have little to no implication as far as detecting a colluding market goes. Similarly, a single witness testifying is often not enough evidence to convict someone of a crime just like the presence of just one or more plus factors is not sufficient evidence to consider a firm 'guilty' of collusion. The presence of several plus factors together however is a strong indication that something is wrong, just like multiple witnesses testifying make for a stronger case. The presence of multiple plus factors in the same market forms a *super plus factor* and is theorized to be a strong indication of collusion within that market. Each plus factor, as identified my Marx and Marshall (2012) is named and briefly explained in the next section. Price elevation

1. Quantity restriction
2. Reduction of buyer resistance

3. Internal incentive shifts
4. Allocation of collusive gain
5. Redistributions
6. Communication and monitorying
7. Enforcement and punishment
8. Dominant-firm conduct

Price elevation is simply the elevation of prices above what they would have been in the absence of collusion. If an econometric model would exist that could accurately predict the price of some product, then positive deviations of this predicted price could be an indicator of collusion. Of course constructing such models is difficult and requires a lot of reliable data, either on the costs that firms have or some sort of benchmark. Nevertheless an accurate model would be of great use to policymakers trying to detect collusion. *Quantity restriction* is, as the name implies, characterized by industry level production levels that are below what they would have been if collusion where absent. A good example is the OPEC cartel, which publicizes its restrictions. The restrictions help to keep the price of oil high on the international market, to the benefit of the OPEC members. *Steps to reduce buyer resistance*: this plus factor relates to the steps that colluding firms will take in order to decrease resistance to price increases amongst their buyers. After all, the effects of collusion include at least some considerable price increases which will be opposed by buyers if they have the power to do so. Marx and Marshall note that collusive price announcements follow certain characteristics. First, they are made at a relatively higher frequency than non-collusive price announcements. Second, these announcements occur at regular intervals. Third, collusive price changes are more incremental, or *gradual* in nature, in the sense that they aren't very large changes as those would be more strongly opposed. Fourth, price

announcements will often be made by multiple firms at the same time, this sends a signal to all buyers in the market that the price change has some underlying cause and buyers won't be able to avoid the increase by switching to another supplier. Fifth, the price announcements can be led by firms that aren't the market leader. This one is rather important if we consider the effects of tacit collusion. Some markets have a strong market leader that everyone else tends to follow. If the market leader increases prices than everyone else will follow suit, not because of explicit agreements but because it is the best strategy for smaller firms to not oppose the leader **some**. If a firm other than the market leader is leading the price increases, with the leader *following* the small firm, than this is cause for raised eyebrows at the least. Sixth and finally, price announcements made in a collusive environment often have long lead times, which means they are announced some considerable amount of time before they become effective, relative to price announcements in a competitive market.

About collusion

When talking about collusion we typically refer to the kind of collusion that makes headlines around the world. These kind of cases typically involve some upper layer of management striking illegal deals with the management of other companies in the same branch, with the goal of reducing competition and raising profits in the sector. The most famous example is no doubt the OPEC cartel, which consists of a number of oil producing countries and aims to elevate the price of crude oil by restricting the amount that is produced by the countries the cartel resides over. Cartels that follow this general formula are mostly illegal (with OPEC being a notorious exception) as governments around the world actively try to prevent and punish them as a means to protect consumers from their effects. There are some less obvious forms of collusion however, as the term in itself simply hints at a broad range of coordination amongst firms that would otherwise compete. An example of collusion that doesn't follow the simple 'restrict output, raise

prices' scheme is the anti-poaching agreement between Apple and Google (Rosenblatt, 2012) whereby they agreed to not try and hire each other's employees in order to drive down wages in the sector. While these lower wages should lead to lower product prices and this cartel thus did not technically hurt consumers, it still led to a large lawsuit filed by employees as it led to lower competition in the labour market and it was deemed illegal for the two companies to coordinate themselves in this way (the case eventually settled for 415 million dollars). Collusion can also take milder forms that aren't punished by the legal system. Groups of companies that work together in advertising their branch of industry and its products as a whole could be said to be colluding, yet they aren't aiming to extract an artificially high price from consumers and still compete with other companies. Collusion like this would be found in markets where many small firms operate that by themselves cannot afford the cost of advertisement.

Tacit collusion (briefly)

One form of collusion is generally unavoidable and isn't necessarily the result of explicit agreement amongst would-be competitors. This form of collusion is called *tacit collusion* and is the result of firms broadcasting their prices on the market and reacting to the also broadcasted prices of its competitors. Initially, one would expect that this sort of environment would lead to bertrand pricing, in which each firm will undercut its competitors by a small margin in order to capture a large market share each time period. Over time this would drive profits to zero, the same outcome as a perfectly competitive market would achieve, at least in theory. In reality, one will find that a somewhat competent manager is quite aware of economic theory regarding market structures and will not blindly accept a zero-profit outcome if there is anything he can do about it. In practice this means that firms will also take the future into account and their expectations regarding the pricing strategies of other firms, meaning that they will expect other companies to follow suit in a price war should they start one. The result is that firms will keep

their prices at the same level as their competitors in fear of retaliation and price wars, leading to price levels similar to those of oligopolies. This effect can be especially present in actual oligopolies, where there is a clear market leader that everyone can follow. Not following the market leader in such a case would simply lead to lower profits in the best case, or an outright price war with the market leader in the worst case.

The possibility of tacit collusion creates a problem for us when analysing the pharmaceutical market because it has market leaders. Therefore, if we would for example find that a number of firms is continuously pushing up prices for some drug, we could not say whether or not the firms were explicitly colluding in order to reduce price competition and increase prices. It might have simply been a case of the largest firm deciding to increase its margins and everyone following suit out of fear of a future price war with the market leader. This is potentially a large issue, luckily there is some alleviation to this problem. First of all, the above description of a market leader 'setting' all market prices works in a market where every firm clearly transmits its price to the buyers/consumers in the market. However, prices to final consumers are not clearly transmitted in the pharmaceutical market. Drugs aren't like other consumer goods in the sense that consumer choose between alternatives based on their preference. The need for a medicine is often immediate and must be satisfied quickly. Most consumers aren't knowledgeable about the various choices they have in medicines to treat their ailments, instead their doctor will describe them a medicine to take. As the prescribing doctor is a medical professional and expected to know about the best choice of medicine they pretty much have the say in what medicine is to be taken and the consumer does not choose at all. This in itself doesn't need to be a problem for competition until we realize that doctors tend to not prescribe a generic drug, leaving the choice of brand up to the patient, but rather prescribe a specific brand of the drug. What's more is that

manufacturers sell not to consumers but to intermediaries such as pharmacists. Since these are business transactions the terms tend to be specified in contracts, which leaves a lot of room for manufacturers to be less than fully transparent about their prices. This means that, even in the presence of a strong market leader, smaller firms can not simply match the leader's price and hope to snatch some portion of the market. They will have to enter into contracts with wholesalers at which point they will have to offer a better price, or compete in some other way. This should somewhat reduce the problem that tacit collusion creates for our analysis, but doesn't solve it. Fortunately there exists an easy and intuitive method that can disprove the presence of tacit collusion in a market. If tacit collusion is a strong factor in some market we should be able to identify one firm, the market leader, that always makes the first move when it comes to increasing prices. A market follower moving first would make no sense, a point that is also raised by Marshall & Marx (2012). If we observe situations in which smaller firms move first, with the market leader matching at a later point in time we can conclude that tacit collusion is unlikely. For these two reasons, we believe to be able to control for the possibility of tacit collusion.

Historical overview of the Indian pharmaceutical market

Government intervention is a keyword regarding the Indian pharmaceutical market, as the sector has been the subject of increasing government regulation in order to combat some of the diseases plaguing it. In 2005, as a result of membership in the World Trade Organization, the Indian government amended its patent laws in order to provide legal protection for intellectual property, introducing the possibility to patent pharmaceutical inventions and thus transforming the industry into a more innovative form compared to the pre-2005 period (Kale & Little, 2007; Chittoor et al., 2009; Basheer, 2005). Prior to the reform, India only recognized process-patents, which allowed the sector to grow rapidly although it innovated little compared to international standards. After the reforms there was a possibility of sharply increased competition as

multinational firms could now enter the market after having sought protection of their intellectual property. Kale & Little (2007) show that it resulted in a strong, self-sufficient industry within the country. In recent years the sector has exhibited growth rates exceeding 10%, whereas the pharmaceutical industries of other developed countries tend towards a growth rate of around 5%. In spite of this unprecedented growth rate the sector still has failings when it comes to the basic task of supplying medicine to the country, as noted by Balarajan, Selvaraj, & Subramanian, (2011). They point out that prices of drugs in the private sector are rising at an alarming which is a big problem considering the relative size of the private medicine industry in India compared to the public sector. Several important medicines are not available in the public sector, which increases the reliability of the people on the poorly regulated private sector. The lack of regulation regarding essential medicines leads to a market that is highly susceptible to unethical practices by the pharmaceutical companies, including the possibility of collusion. The dependency of the people on the expensive private sector and its effect on the ability of low income groups to access healthcare has prompted the Indian government to increase regulation in more recent years, reviewing the list of medicines it deems ‘essential’ and expanding it with new drugs to be controlled more strictly with regards to price. The drugs chosen for the list were chosen because they were the most important to the people and were thus most likely to be exploited if left unregulated.

Data

The dataset used contains detailed economical information about 48 medicines which are sold in India and are partially controlled by the government. The data recorded includes: Price to retailer, maximum retail price, sales volume, free giveaways, generic name, SKU codes, ATC codes, company, and state and is recorded with monthly intervals and at the SKU (medicine) level,

making this dataset incredibly precise, allowing for a detailed regression analysis. Furthermore, the SKU codes contain further information about each observation. This includes: dosages, package size, delivery type, brand name, and release speed. The ATC codes are used to identify groups of medicines by purpose. From the information on dosage and package size we were able to calculate weighted prices, allowing for easy comparisons in price across different dosage and package sizes. The generic names and dosage information also made it possible to create a dummy variable that indicated whether or not a medicine was included in the DPCO of 2013, as this document provides combinations of generic names and dosages to come under price control. With all the relevant data in place it was possible to construct summary statistics for each medicine in the dataset which we will talk about in the next section.

Summary analysis

Preceding any statistical analysis an exhaustive study of the summary statistics of the dataset took place. The reason for this was to gain some initial insight into the data and more importantly, the things the data represented. In order to accomplish this we checked each medicine that was present in the dataset for its use in healthcare using an online database[5] on healthcare drugs. Information on which dosages were controlled and which weren't was taken from the DPCO 2013 as discussed earlier. The next step was to construct some meaningful summaries with all this information. The choice fell on a collection of graphs that could easily show the movement of over time of important economic variables. Thus for each individual medicine the price and sales quantities over time were graphed. These graphs were separated by controlled medicines and uncontrolled medicines, and also by dosage and company size. Each graph was also accompanied by a brief description about the medicine it related to, indicating what the medicine

[5] The database used is http://www.apotheek.nl/medicijnen. It is a Dutch website designed as an information portal for patients who wish to look up information about a medicine.

was used for, which dosages it was sold in and which of these were controlled as per the DPCO 2013. Examining these graphs provided us with some common occurrences across the different medicines. Prices are trending upward over time. This upward trend does not seem to be specific for certain dosages when viewed at a glance, instead all dosages are getting more expensive. For some medicines the increase isn't all that dramatic, for example the drug Atorvastatin, which lowers cholesterol in the bloodstream, exhibits a rise in price of about 10% over a period of 5 years. A rise of about 20% is more common however, and in the case of Metformin, a diabetes medicine that lowers blood sugar levels, prices rise by as much as 40% over the same period. An important side note here is that India has relatively high inflation rates[6] which may help explain some of the increase. There is one exception to the rising trend and it is Cefixime, a drug that aids in preventing epileptic seizures. Its prices actually drop by 20-30% (depending on dosage). There are also a few drugs which show an initial decline in prices followed by sharp increases later in time and a few that remain at more or less the same price level. Overall though many drugs are getting more expensive. Another characteristic that the graphs show are differences in sales volume between dosages. Sales figures for many drugs are dominated by either controlled or uncontrolled dosages, with controlled dosages dominating the sales more often. This isn't surprising of itself as certain dosages, usually relatively low ones, are simply very common due to higher dosages only being required in extreme cases of illness. As these dosages are more commonly sold they are more important to the public and are therefore more likely to be selected by the government to come under price control schemes, explaining the fact that controlled dosages often dominate. Their relative importance also makes them more vulnerable to exploitation, another reason for these dosages in particular to be controlled by the government,

[6] According to the worldbank data the annual inflation in India was 8% or more during the time period 2008-2014. (http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?locations=IN)

more on this will be said in the method section. The interesting thing here is that the dosages that dominate also seem to more often than not be relatively more expensive. This leaves us with the odd combination of more expensive medicines often being the medicine of choice for patients. This is indicative of the potential problem we touched upon earlier in the theory section, about the lack of information on the side of the patient. These are generic medicines after all, meaning that they are a very homogenous product. With this in mind it seems highly unlikely that well-informed customers would select expensive dosages, especially considering that these undersold, cheap dosages are sold by the same companies that produce the expensive variants, and even under the same brand name. Because the same companies are involved we can rule out successful branding as a cause for this phenomenon. When the graphs were set up to distinguish between large and small companies another interesting phenomenon was revealed. It seems that large companies, defined as those companies selling a brand with a 1% or greater market share, are often charging a much higher price than small companies. Also, when prices are seen to increase, either sharply or over time, it seems to be driven in many cases by large companies. These things are observed particularly for medicines that show a clear disparity in price and sales volume between controlled and uncontrolled dosages, which leaves us with an interesting situation in which large companies are not only charging more for their product than small companies for a similar product but are also pushing the most expensive variants of this product to their customers, all while retaining a relatively large market share. While none of this directly points to colluding behaviour it does indicate a serious problem in the market, as people are seemingly overcharged heavily for medicines. While such a situation is bad enough for consumers in general it is even worse in this market, as consumers that are priced out will have effectively lost access to healthcare and are at risk of falling victim to illness. While primarily a social issue, the potential effect on the economy that this can have should not be underestimated, a sick workforce

is not a productive workforce after all, and public healthcare systems may potentially face the same problem as consumers and end up overspending, effectively wasting tax money on overpriced medicines. This issue is outside the scope of this paper however so we will leave it at this. Needless to say though, it peaked our curiosity even further as we examined the medicines. A few medicines in particular seemed to stand out, but in order to select the most tale-telling case study we had to provide a more thorough basis than graphical analysis. We therefore performed a statistical analysis of every medicine which is explained in the following section.

Method

As stated earlier, the current process by which cartels and other forms of collusion are discovered is through journalistic investigations or whistle blowers from within the cartel. In this paper however, we will utilize an empirical analysis using the basic economic data that we have on prices and sales quantity to scan the market for the presence of plus factors. We will first give the reader a brief idea of this process in this section before proceeding to explain the choice of dependant and independent variables in the next two sections, and finally identifying the control group in the last section in this chapter. We focus on the plus factors of *price elevation, quantity restriction,* and *reduction of buyer resistance*. We also provide a qualitative analysis after the empirics in order to provide the reader with another outlook on the results beyond numbers. The empirical analysis will consist of a series of difference-in-difference regressions that will provide us with statistical evidence regarding the behaviour of some economic variables in the market. The formulae that are estimated take the following form:

$$Y = \beta_1 * dControl + \beta_2 * Period2 + \beta_3 * Period3 + \beta_4 * Period2xdControl + \beta_5 * Period3xdControl + \beta_6 * dSlow + \tau_t + \alpha_{i,t} + \epsilon$$

The next sections will explain this formula more thoroughly. The dependant variable Y will be substituted by a variety of variables –that is to say: each regression will estimate the effect of the same set of independent variables on a different dependant variable- which are, in order; 'Weighted price (PTR)', 'Weighted price (MRP)', 'Sales quantity', 'Price increase (PTR)', 'Price increase (MRP)', 'Absolute price increase (PTR)', and 'Absolute price increase (MRP)'. Variables followed by (PTR) or (MRP) relate to 'Prices To Retailer', and 'Maximum Retailing Price, respectively. The difference between price increase variables and absolute price increase variables is that the former relate to a dummy variable that takes value 1 when prices rise and is 0 otherwise, whereas the latter relates to the actual amount by which the price changes in the case of an increase. The aim of having so many different dependant variables is to test for all the different plus factors. Each 'type' of dependant variable (price/quantity/frequency etc) relates to a distinct plus factor. The first two variables, weighted PTR and weighted MRP are used to test for the presence of *price elevation*. In the presence of this plus factor we expect to see a positive and statistically significant coefficient for the explanatory variables (which we will delve into in the next section), indicating that prices are elevated above what would normally be expected. The third dependant variable, sales quantity, is used to test for the plus factor of *quantity restriction*. In the presence of this plus factor we would expect to see a negative and statistically significant coefficient for the explanatory variables, indicating an inexplicable reduction in sales volume. The remaining four dependant variables, all related to price increases, are meant to test for the presence of the plus factor of *reduction of buyer resistance.* The first two variables in this set relate to the frequency or quantity of price increases in the market while the latter two variables measure the actual change (in rupees) in the price in the case of an increase. Recall that in the event of collusion, firms will try to reduce their buyers' resistance to price increases by increasing the price more frequently, thus signalling that this is standard practice, while

simultaneously reducing the size of each individual increase, making it less likely that a buyer will heavily fight any particular increase. If we relate this to the regressions, we would expect –in the presence of collusion, positive and statistically significant coefficients in the first two regressions (with price increase as the dependant variable) and a negative and statistically significant coefficient in the latter two regressions (with absolute price change as the dependant variable). A combination of these expected results along these four regressions would be a strong indication of the presence of this particular plus factor.

In this next section we will talk about the independent variables. The main explanatory variables are the interaction terms, which are constructed from two dummy variables: ‘dcontrol’ and ‘period1-3’. ‘dcontrol’ has value 1 for medicines that are included in the DPCO of 2013 and value 0 otherwise, it simply tracks controlled medicine formulations. ‘period1-3’ is a set of three dummy variables (period1, period2, period3). These variables have value 1 if an observation falls within its related time period and have value 0 otherwise. The period dummies mark specific (and important) time periods in the dataset and are chosen as follows: period 1 denotes the period before September 2009, which is when consultation regarding the updating of the essential medicines list began. We can see this period as the period before any strong anticipation regarding the control of any particular medicine. The second period is the time between September 2009 and June 2011 and is the period during which consultation took place before updating the essential medicines list. In this period, firms may have anticipated certain medicines coming under control but could still effectively lobby against changes as nothing was final, you could say that there was weak anticipation. The final period stretches from June 2011 to June 2013, from the month in which the essential medicines list was updated until the DPCO coming into effect. During this time firms had exact knowledge about the medicines to come under

control and could take action accordingly, in other words there was strong anticipation. The medicines selected for the DPCO were all important for the general public and were thus arguably more susceptible to exploitation. Considering that the possibility for this would be reduced drastically after the DPCO took effect we anticipate that colluding activities (if present at all) would peak for these medicines as anticipation rose, with firms wanting to extract value before prices were forced down, more information on this train of thought can be found in the following section where the control and treatment group choices are explained. The effects on sales volumes are particularly interesting in this regard, as a good way of offsetting any potential losses is to shift sales and production to other formulations which are not controlled. The main variables we look at in the results are then the interaction terms of dcontrolxperiod2 and dcontrolxperiod3, with dcontrolxperiod1 chosen as baseline. Control variables include the dummy variables of period and dcontrol themselves, another dummy which takes value 1 for formulations designed as 'slow release' medicines (literally meaning the substance is released more slowly, a trait which may be valued by some and should thus be controlled for) and several fixed effects, namely time fixed effects, which are based on the month in which observations took place, and company-state fixed effects which are unique for each combination of company and state meaning it controls for particular behaviour that any individual firm exhibits in any particular area of operation. Company-state fixed effects are used instead of individual company fixed effects and state fixed effects because the behaviour of firms may change between states based on things like regional market share, demand, wealth and such factors which may prompt firms to adjust their policy from state to state.

Finally we will talk about the control- and treatment group. In order to test our hypotheses and indeed make any sort of statement regarding the presence of plus factors in the Indian

pharmaceutical market we will need some information. Ideally we would know exactly what is going on at firms at the managing level but obviously such information is kept strictly secret by the firms themselves, as releasing it is harmful. Fortunately there is another way in which we use a control group to test the behaviour of the medicines. It just so happens that we have the perfect control group, after all we are looking at medicines which are partially controlled, which means we can use the uncontrolled dosages as a control group for the controlled dosages. Since there is no difference between control group and treatment group except for dosages we have a perfectly valid control group as long as we weigh prices. Of course this method is based on the assumption that these controlled dosages are somehow much more susceptible to colluding behaviour than the uncontrolled dosages are and can thus be thought of as a treatment group when testing for collusion. Medicines in general are less transparent with regards to their pricing mechanisms, but this is true for controlled and uncontrolled dosages alike, so how are the controlled dosages different? We can defend this assumption by pointing out the same characteristics of these particular dosages that the Indian government identified when they decided to control these dosages specifically: they are deemed *essential*, meaning there is high, stable demand for these medicines in *these dosages specifically*, making them a target for collusion that has particularly high potential payoffs. At the same time, the super plus factor of *price elevation* and *quantity restriction* becomes even stronger as higher prices with lower supply suggests that sales are being shifted to uncontrolled dosages, making the medicine market more susceptible to potential exploitation once again.

From the plus factors we derive three testable hypotheses, which are formulated as follows:

1) *"Prices for controlled dosages are higher relative to uncontrolled dosages of the same medicine"* ,

2) *"Sales quantities for controlled dosages are lower relative to uncontrolled dosages of the same medicine"* , and
3) 3) *"The nature of the timing and size of price increases for controlled dosages are such that buyers in this market are less likely to oppose the changes, relative to the nature of these factors for uncontrolled dosages of the same medicine"*.

From the combination of formula and hypotheses we can derive the following statistical tests (the same test is repeated for each hypothesis, with different dependent variables for each one) :

H0: the combination of a dosage being controlled and being sold in a period with high anticipation (period 2 or 3) does not have the expected effect on the dependent variable.

Ha: the combination of a dosage being controlled and being sold in a period with high anticipation has a statistically significant effect of a certain sign

The expected sign differs depending on the dependent variable being used and the plus factor that is being tested, an opposite sign from the expected sign described below does not corroborate our hypotheses and is taken to not reject the null hypothesis, thus explaining our choice of words when formulating it. When collusion is present in the treatment group we can expect prices to be higher relative to the control group, so when regressing with the price (PTR or MRP) as dependent variable the null hypothesis is rejected when the estimated coefficients of β_5 and/or β_6 are statistically significant and show a positive sign. The effect of collusion on sales quantity is expected to be negative when collusion is a factor, so when sales volume is the dependent variable we reject the null hypothesis if the estimated coefficients of β_5 and/or β_6 are statistically significant and show a negative sign. The expected effect of collusion on the nature of price

increases consists of two parts. 1: the amount of price increases that occurs is expected to go up, and 2: the size of these individual changes is expected to go down. Therefore, when the dependent variable is the amount of price increases (PTR or MRP) we reject the null hypothesis if the estimated coefficients of β_5 and/or β_6 are statistically significant and show a negative sign. When the dependent variable is the size of price increases (PTR or MRP) we reject the null hypothesis when the estimated coefficients of β_5 and/or β_6 are statistically significant and show a positive sign. This means that for each medicine, we have two regressions to test the first hypothesis, one regression to test the second hypothesis and four regressions to test the third and final hypothesis.

Interim results

The result tables of all the regression can be found in full in Appendix A at the end of this paper. The main purpose of this stage of the analysis was to get a sense of the state of the market as far as the presence of plus factors is concerned, and to use this knowledge to select a suitable candidate for a case study, as we felt that an in depth-analysis would be desirable for the purpose of maximum inference from the results and a resulting strong conclusion. Because the first and third hypotheses are tested with multiple regressions it is possible for them to be partially corroborated. It's also possible for one or more of the hypotheses to be corroborated while others are rejected. Naturally the hypotheses that are confirmed and rejected differ from one medicine to another, in order to come up with a suitable case study, a medicine would have to be selected that corroborated the most of these hypotheses, preferably in full (so no partial rejecting of the null hypothesis) and preferably for all three hypotheses at the same time. Sadly the results did not yield such a medicine. The second hypothesis testing the presence of *quantity restriction* was rejected for most medicines and the third hypothesis which tests for *reduction of buyer resistance*

was never fully accepted, although it was accepted partially in many cases. The fact that four separate regressions test this hypothesis may be the cause for this. Although no medicine showed the expected result in all regressions and thus exhibited the presence of all the plus factors we tested for there were several that showed some combination. As we explained in the theory section of this paper, the combination of *price elevation* and *quantity restriction* is one that is particularly strong when trying to infer collusion and is thus of interest. Three medicines in the dataset showed the presence of this super plus factor, they are: Isosorbide-5-Mononitrate, Rifampicin, and Spironolactone[7]. In addition to the super plus factor the regressions for these medicines also partially corroborated the third hypothesis, making these medicines the most likely to be subjected to collusion. Of these three medicines, Isosorbide-5-Mononitrate was deemed the most suitable candidate for investigation. The first reason for this being that it showed the strange combination of the controlled dosage exhibiting both higher prices and higher sales at the same time, and the second reason for this being that the controlled dosage of Spironolactone (25mg) is only sold by a single company, which makes it rather difficult for them to collude with its (non-existent) competitors in this market. We will return briefly to the whole sample before the conclusion section. Again, should the reader desire to see the result tables for these medicines and the others, they can be found in appendix A.

Isosorbide Mononitrate

About

Isosorbide mononitrate is a drug most commonly used to prevent or reduce the effect of angina pectoris, which is an umbrella term for describing a constant sensation of chest pains. Angina

[7] As a true testament to the importance of statistical testing and scientific method in general, none of these three medicines seemed particularly interesting judging from the summary graphs discussed earlier, apart from Isosorbide-5-Mononitrate showing a large disparity in price between dosages combined with a disparity in sales volume.

pectoris can have a number of causes including coronary artery disease. Isosorbide mononitrate causes blood vessels to dilate, thereby reducing blood pressure which helps combat this disease and alleviates the pain. Studies are also being undertaken to analyze the drug's potential use for pregnant women, by facilitating cervical ripening (the process of softening and dilating of the cervix which allows for fetus delivery). This could potentially aid women with a postdated pregnancy (a 'late' delivery) as panel studies suggest shorter deliverance times and lower morbidity rates among those who used the drug.

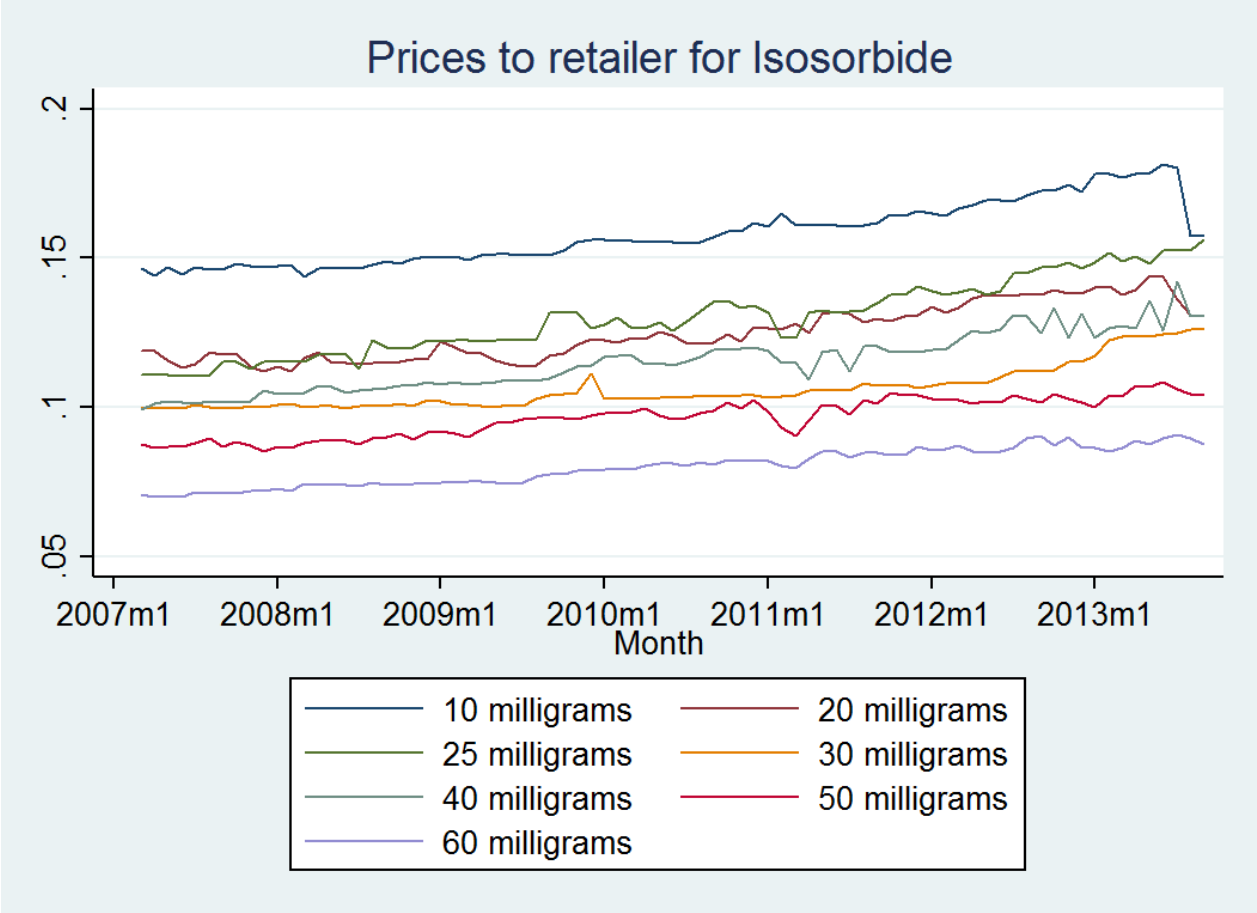
In the Indian market

Isosorbide mononitrate is being sold on the Indian market by a total of 37 companies that we have data on and is sold in varying dosages. These are, in ascending order: 10, 20, 25, 30, 40, 50, and 60 mg. Only the smallest two dosages (10 and 20 mg) fall under the price control regulations from DPCO 2013. The drug seems to have a relatively unscrupulous history, save for a few incidents in recent history. In November 2012 a number of drug testing facilities were set up in India to test the quality of drugs being sold there. Within the first 11 months they reported a total of 118 of 'substandard drugs', which included a batch of isosorbide mononitrate tablets manufactured by Biochem Industries ltd. In 2016, Italian investigators uncovered major deficiencies in pharmaceutical plants ran by Indian based manufacturers, this report relates to findings in Italy however and makes no speculation regarding conditions in India. Isosorbide mononitrate came under price control following the DPCO act of 2013, although only the 10 and 20 mg dosages were included. All other dosages, including the 25mg dosage, the closest substitute to the controlled variants, are left uncontrolled and manufacturers are free to set whatever price they wish for these dosages.

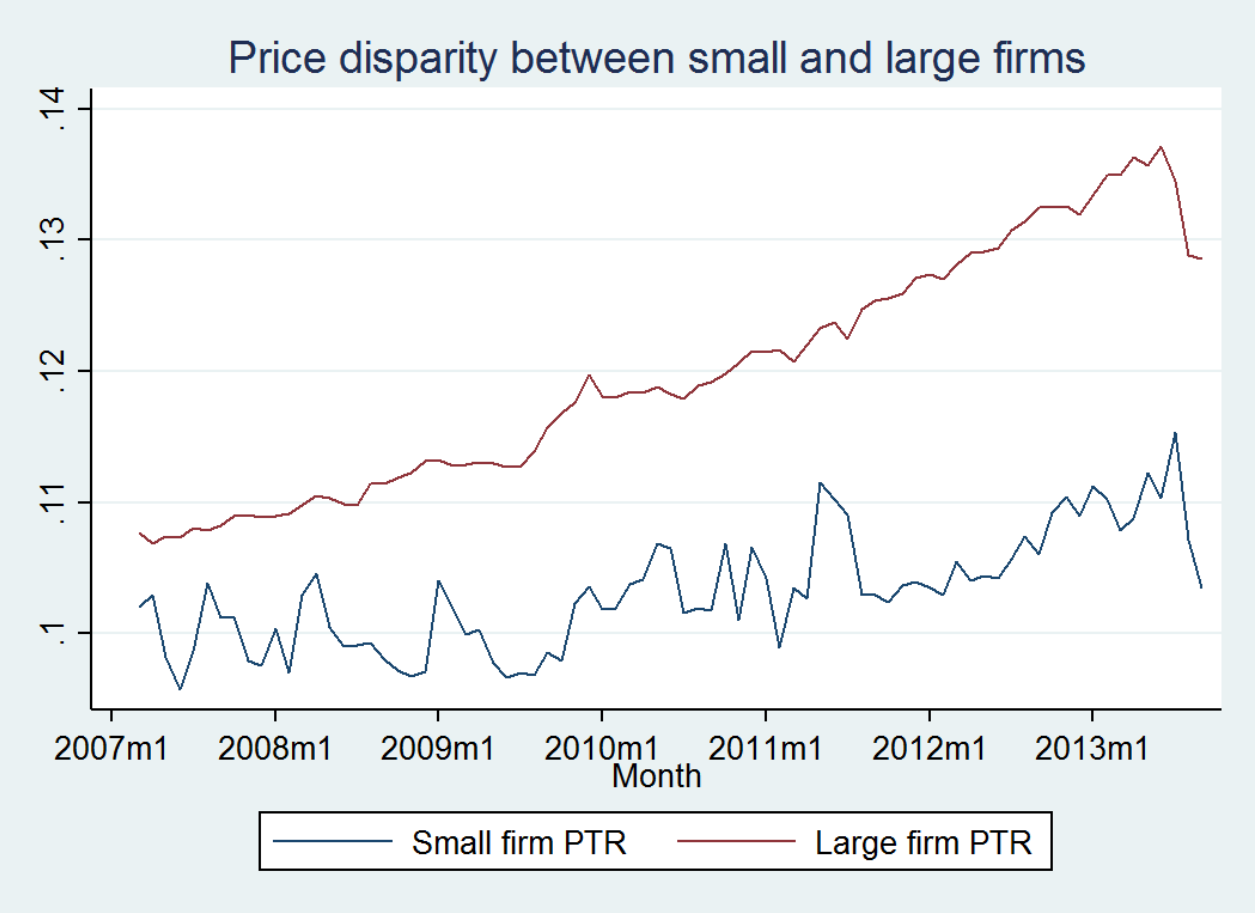
Summary statistics

We first present two graphs showing the price development of isosorbide-5-mononitrate which show the overall price development of this drug over time. The first graph (graph 1: monthly PTR by dosage) shows average prices across all firms for each dosage. One remarkable feature that immediately stands out in this graph is the relatively high price of the 10 milligram dosage, which is being sold for an average price of 0.15 rupees per milligram in 2007, with the second most expensive dosage trailing behind at around 0.12 rupees, a 20% difference. In general the lowest dosages are more expensive, with the 3 lowest dosages (10, 20, and 25 mg) also forming the top 3 most expensive formulations. All dosages trend upward for most of the time period for which we have data, but the 10 and 20 milligram dosages experience a sudden price drop in 2013, probably the result of the DPCO that came into effect in May that year. This drop in price causes the closest uncontrolled substitute for these dosages, 25 milligrams, to converge in price with the 10 milligram dosage. The second graph (graph 2: monthly PTR by dosage and firm size) shows average prices across all dosages, but separates the data in large and small firms. Firms are deemed large if their market share exceeded 1%, which is the same standard used by the Indian government when deciding which firms would be used in calculating the new ceiling prices. What´s interesting in this graph is that it shows large firms charging a higher price than small firms, with a difference in price that increases over time. A rather impressive feat considering the fact that isosorbide mononitrate is a very homogenous product. In the next section we will present the results from our analysis of this medicine.

graph 1: monthly PTR by dosage



Graph 2: montly PTR by dosage and firm size



Results

The table below, Result table 1, lists the regression results for Isosorbide-5-Mononitrate, the dependent variables are: Price to Retailer (column 1), Maximum Retailing Price (column 2), and Sales Quantity (column 3). The explanatory variables shown are the controlled formulation dummy variable, interaction variables between control and period dummies (with period 1 being omitted as it is baseline), and a constant. A slowed release dummy is used as a control variable but isn't shown, time and company-state fixed effects are also not shown. Period 2 and period 3 dummy variables are omitted by Stata and are not shown because of it.

Result table 1

VARIABLES	(1) PTR	(2) MRP	(3) Sales
controlled formulation dummy	0.0415***	0.0532***	2,826***
	(0.00173)	(0.00220)	(429.8)
Period 2 interaction with control dummy	0.000830	0.00125*	-236.7*
	(0.000570)	(0.000751)	(140.9)
Period 3 interaction with control dummy	0.00247***	0.00287*	-705.8***
	(0.000761)	(0.00154)	(197.2)
Constant	0.0486***	0.0642***	-2,227***
	(0.00195)	(0.00242)	(388.8)
Observations	92,899	92,899	92,952
R-squared	0.764	0.704	0.301

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
time FE
and company-state FE not shown
errors are clustered around company-state

As is evident by the first two columns in the table, there is a positive and statistically significant relationship between the dependent variables PTR and MRP and the interaction term for period 3 and the control dummy. There is also a positive and statistically significant coefficient for the controlled formulation dummy. These results suggest that companies are raising the price of this medicine specifically for the controlled dosages, and even more so in period 3 (for controlled dosages). Since we have a valid control group –the exact same medicine but uncontrolled by the government- we accept the presence of the plus factor of price elevation for isosorbide-5-mononitrate. The third column shows the results when quantity of sales is the dependent variable. As can be seen, the controlled formulation dummy has a large positive and statistically significant effect which is likely the result of selection bias. The dosages that the government chooses to control are likely selected at least in part on their weight in sales, with formulation that are sold in

large quantity being considered earlier as their relative price has a larger impact. Both interaction coefficients (period 2 AND 3) are negative and statistically significant which tells us that the sales quantity of controlled formulations is dropping in these periods specifically. This result corroborates (correct use of word?) the presence of the plus factor of quantity restriction for this medicine. As we discussed earlier, the combined presence of price elevation and quantity restriction constitutes as a super plus factor, as a rising price in combination with dropping sales strongly suggests some form of collusion. In the following table, Result table 2, we show the results regarding the frequency and size of the price changes. Like in the previous table, a slowed release dummy is not shown. Time and state-company fixed effects are also not shown, but are included in the regression as control variables. Dummies for period 2 and 3 are omitted by Stata and are thus not shown either. The variables shown are the dummy that indicates controlled dosages and the interaction effects between this dummy and the dummies indicating periods 2 and 3. The dependent variable differs in each columns. Columns 1 and 2 show the frequency at which price increases occur for PTR and MRP, respectively (technically, the dependent variable is a dummy variable that is 1 for observations that indicate a price increase and 0 otherwise and thus cannot be interpreted as a frequency per se, however a positive influence on this number means more price increases so talking about frequencies makes intuitive sense and is still correct so long as we don't make direct statements about the absolute value of this frequency and instead simply say it goes 'up' or 'down'). Columns 3 and 4 have the absolute amount of the price increase as the dependent variable, again for PTR and MRP respectively and weighted to correct for differences in dosages and package sizes.

As is evident from the table, we are observed a positive and statistically significant result for the period 3 x control interaction term in the first two columns, meaning that prices are increasing

more often in period 3 for controlled formulations specifically. Recall from the theory that colluding markets are expected to exhibit a

price change pattern that has a relatively high amount of small increases in order to reduce the resistance that buyers will have to these changes (they would protest harder against singleton large increases). We observe the relatively high amount of changes, but we also have to look at the size of these changes. In columns 3 and 4 we can test this by looking for negative coefficients for the interaction terms. For the interaction term of period 3, we observe a negative and statistically significant coefficient in column 4 only (MRP). Both columns show a negative and statistically significant coefficient for the interaction effect for period 2, but these are not coupled with a positive and significant coefficient in columns 1 and 2. Because of this, we can only partially accept the presence of reduction of buyer resistance in this market.

Result table 2

VARIABLES	(1) PTR frequency	(2) MRP frequency	(3) PTR increase	(4) MRP increase
Controlled formulation dummy	-0.0405***	-0.0350***	6.99e-05***	0.000521***
	(0.00353)	(0.00367)	(2.70e-05)	(9.55e-05)
Period 2 interaction with control dummy	-0.00517	-0.00971**	-0.000241***	-0.000308***
	(0.00352)	(0.00456)	(4.79e-05)	(5.92e-05)
Period 3 interaction with control dummy	0.0195***	0.00723*	1.73e-05	-0.000520*
	(0.00355)	(0.00410)	(4.17e-05)	(0.000299)
Constant	0.0485***	0.0563***	0.000279***	0.000311***
	(0.00453)	(0.00490)	(3.65e-05)	(5.06e-05)
Observations	90,922	90,922	90,922	90,922
R-squared	0.048	0.106	0.028	0.028

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
time FE
and company-state FE not shown
errors are clustered around company-state

qualitative analysis

In the following paragraphs we take a more direct look at the development of prices for Isosorbide, after all there is much that regressions won't tell us. We might be able to broadly say that the market has some characteristic of collusion judging from the results so far but this also raises new questions: who are the important players in this market and how does their behaviour relate to this result? We will take a closer look at the treatment group (10 and 20 milligrams) in the following tables and graphs. First are two tables below which show the 10 largest companies, by sales volume, for both dosages.

Table 1: 10 milligrams

Company	Weighted PTR	Sales
Zydus Cadila	0.13	51189
Pernteral Drugs	0.1	92254
Stadmed PVT. LTD.	0.13	172794
Biochem pharmaceutical INDS	0.11	344682
Torrent Pharmaceuticals LTD.	0.12	465660
Micro Labs LTD	0.15	1462767
Lupin LTD	0.13	1473860
Intas pharmaceuticals LTD	0.16	5332837
Abbott Healthcare PVT. LTD	0.19	14596656
Sun pharmaceutical industries LTD	0.20	18956788

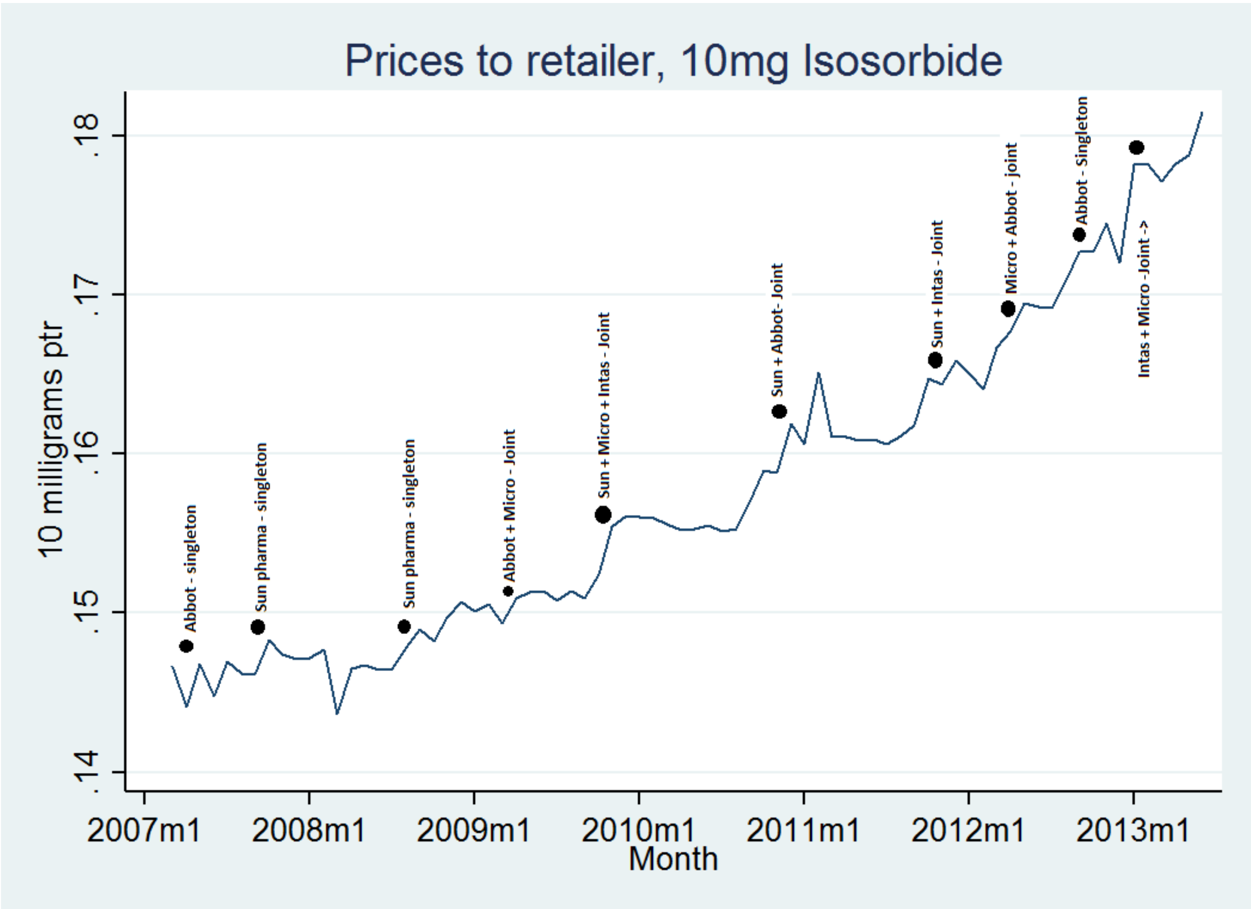
Table 2: 20 milligrams

Company	Weighted PTR	Sales
Merck LTD	0.10	901993
Biochem pharmaceutical INDS	0.12	932923
Torrent pharmaceuticals LTD.	0.12	979219
Novartis India LTD	0.14	1301395
Micro labs LTD	0.14	2160784
Lupin LTD	0.10	2309437
Zydus Cadila	0.08	2463851
Intas pharmaceuticals LTD	0.13	9131337
Abbott Healthcare PVT LTD	0.16	26701495
Sun pharmaceutical industries LTD	0.16	29543046

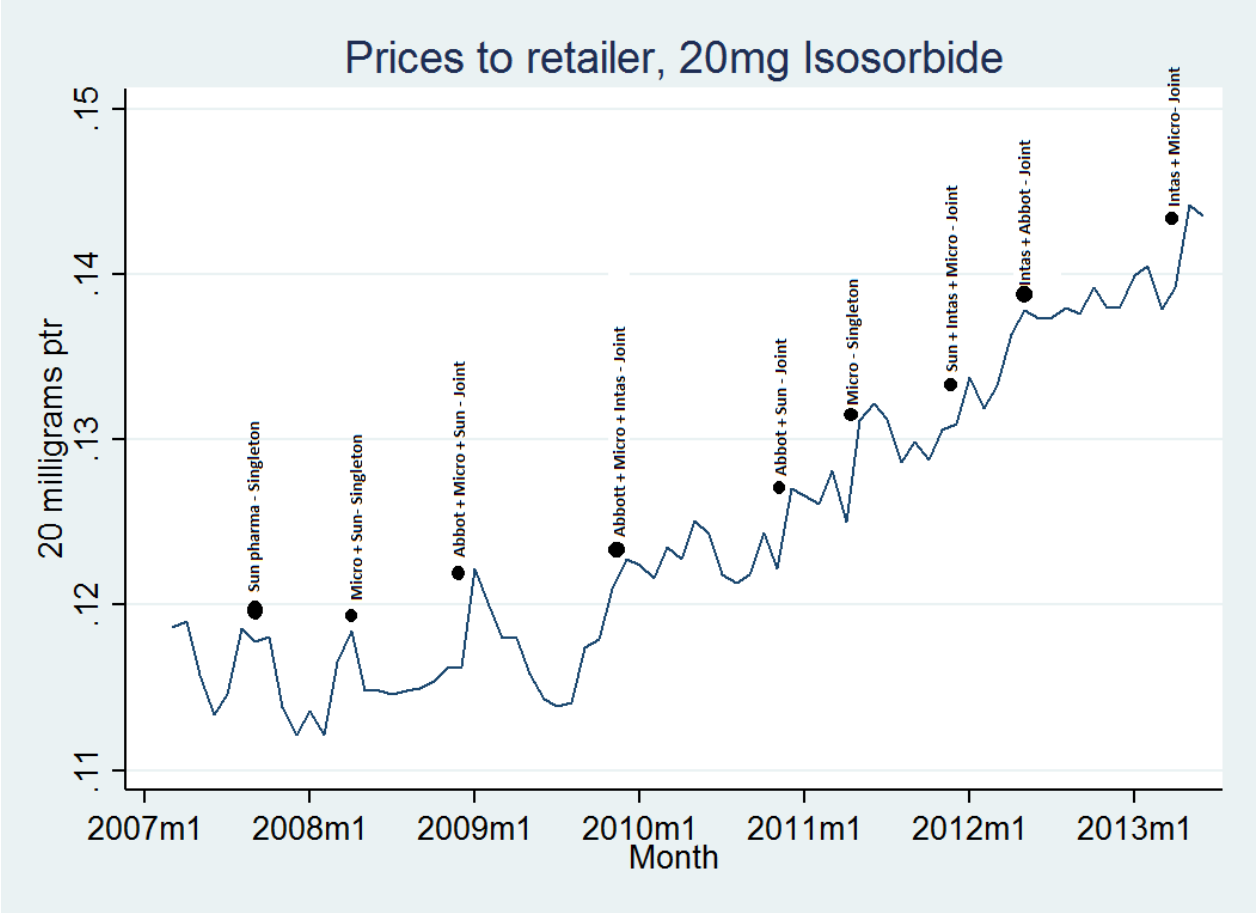
One thing that already stands out is the higher price that larger companies seem to be able to charge. Since it would make little sense for a large number of small companies to coordinate as opposed to a

small number of large companies we take some particular interest in the behaviour of these top 10 companies, moreover the pricing strategies of these companies will have a much larger impact on the market due to the sheer size of the market share that these companies have. We now present two graphs which show the price development over time of 10 mg Isosorbide and 20 mg Isosorbide, respectively, followed by an explanation and interpretation.

Graph 3: Monthly PTR, 10 milligrams isosorbide-5-mononitrate



graph 4: Monthly PTR, 20 milligrams isosorbide-5-mononitrate



explanation

The line in each graph shows the price of the respective dosage of the medicine over time. The small circles show price increases, their position on the x-axis corresponds to the time when the increase occurred and the text description above it shows the companie(s) involved as well as the nature of the price change, where singleton indicates that a company increased their price by themselves and join indicates that multiple companies increased their prices together. Some pruning was in order, only a few companies are shown as most of the companies are rather large and not worth investigating. Furthermore, price increases were marked as joint if the companies increased prices within a 3-month timespan starting from the first increase. The First company listed in the description is the also the first company to increase prices, except for a few cases

where the change occurs in the same month and a leader cannot be identified (as data is monthly). The graphs focus on four companies specifically for the reason that other companies present among the largest 10 are not observed to push their prices up in the same manner, they charge prices that are 10% lower or more and make very infrequent price changes (sometimes only once over the entire period 2007-2013). The companies focused on seem to be closer together in terms of the price they charge and the frequency with which they increase this price.

Interpreting

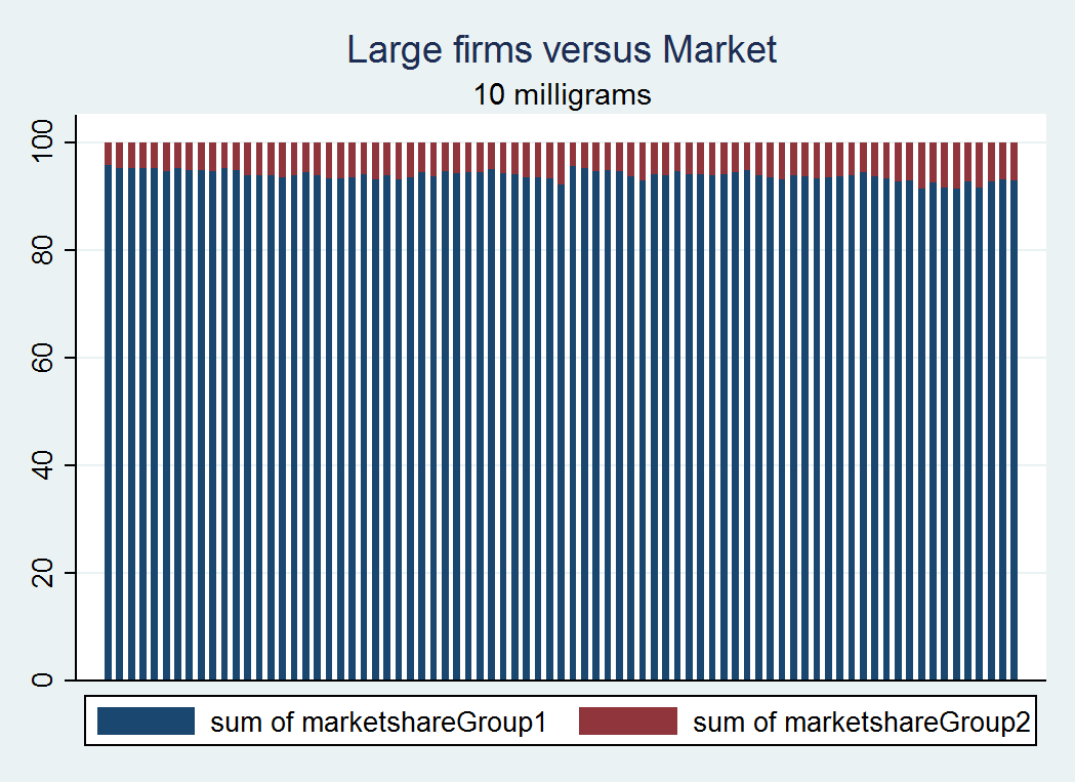
The main thing we look for when interpreting the pattern of price changes is both a change in the nature of the increase, i.e. a sudden shift to joint changes only, and the leading company in the joint changes. When looking at the nature of the price increases we note that, for both dosages, joint changes are observed more after 2009, as opposed to the 2 years before 2009 when we only observe some singleton changes. We must note two things however. Firstly, singleton changes do not disappear completely, as we still observe them in 2012 (10 mg) and 2011 (20mg) which would heavily contradict the notion of these companies coordinating their price changes. Secondly, Abbott is seen to have a rather rigid pattern of increasing their price, raising it by some appreciable amount in regular intervals of 1 to 1,5 years. It may well be that Abbott has no interest whatsoever in the timing of price increases of other companies and simply sticks to its regime, which would mean that several Joint increases in the graphs could also be interpreted as a singleton change which just happened to coincide with Abbott's timing interval. Looking at market leadership for the 10 milligrams formulation we can observe that Sun pharmaceutical leads every increase in which it is jointly involved, as one might expect for a market leader in sales. The increases that don't feature Sun both involve Abbott and Micro, with Micro leading once and Abbott leading the other time. These increases could be seen as separate changes for the reason stated earlier. Insofar as collusion goes, this behaviour does not provide much, if any,

indication of colluding practices in this market. In the market for the 20 milligram formulation we observe Abbott leading the joint price increases between 2009 and 2011, whereas after 2011 the leader switches, with Sun pharmaceutical leading one increase and Intas pharmaceutical leading two increases. The changing of leadership is interesting, as it contradicts expected market behaviour. The fact that Sun pharmaceutical -who is market leader in terms of sales in this market also- only leads one price increase is also strange, given the fact that it prices aggressively in the 10 milligram market. It isn't clear why Sun pharmaceutical behaves so different in this market. Something else that jumps out is Micro being involved in many price increases, often joined by Intas. Before 2010, Micro seems to lead these changes whereas Intas leads after 2010. There are also singleton changes by Micro however so this behaviour does not seem to point very strongly towards collusion.

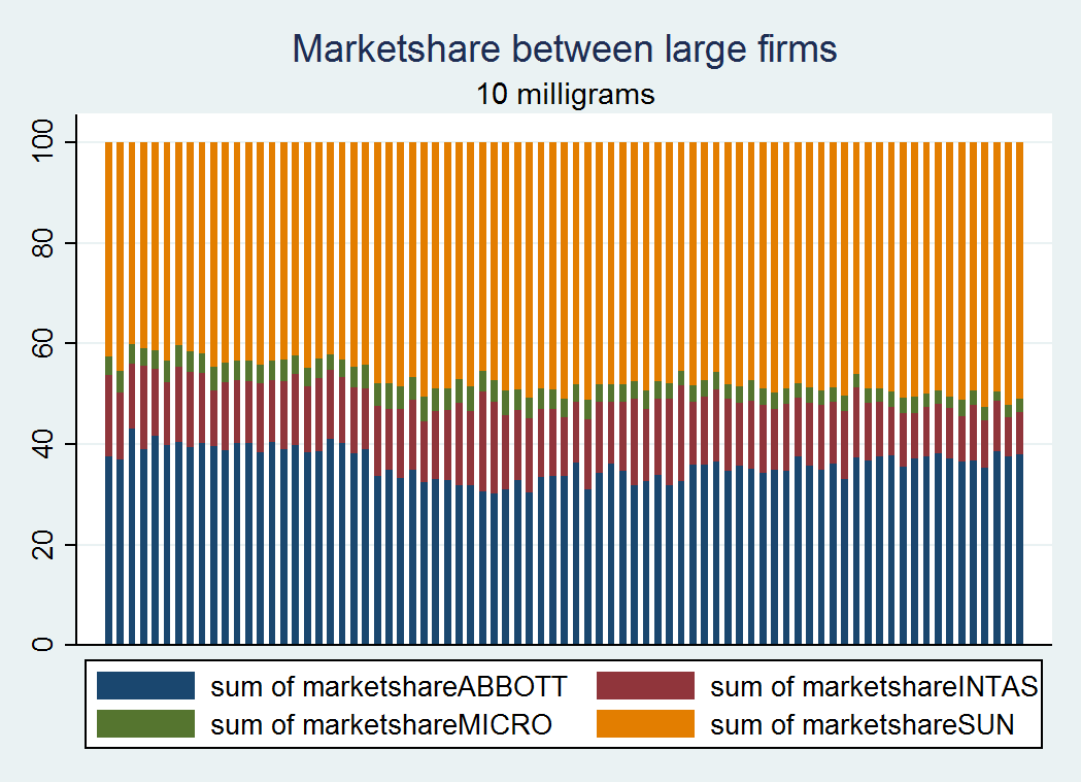
Marketshares

The final thing we take a look at are the market shares held by these companies. As noted by (Marshall & Marx, 2012) we can expect market shares to fluctuate in a competitive market, as firms will attempt to gain market share, often at the expense of their competitors. In a colluding market the opposite happens, with market shares between the firms involved being very stable as a result of inter-firm agreements regarding relative sales. Plotting these market shares between large firms and between this group of firms and the rest of the market therefore has some merit when discussing the likelihood of collusion in the market. The graphs are presented below, followed by an explanation and interpretation.

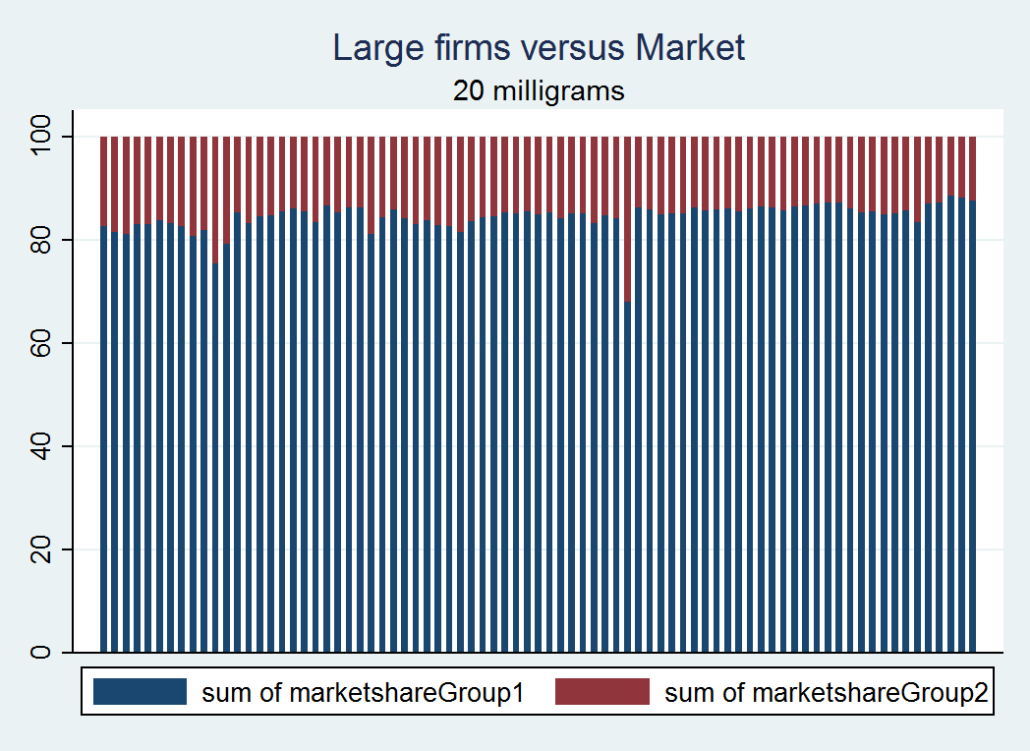
graph 5: market shares of large firms (group1) vs small firms (group2), 10 milligrams



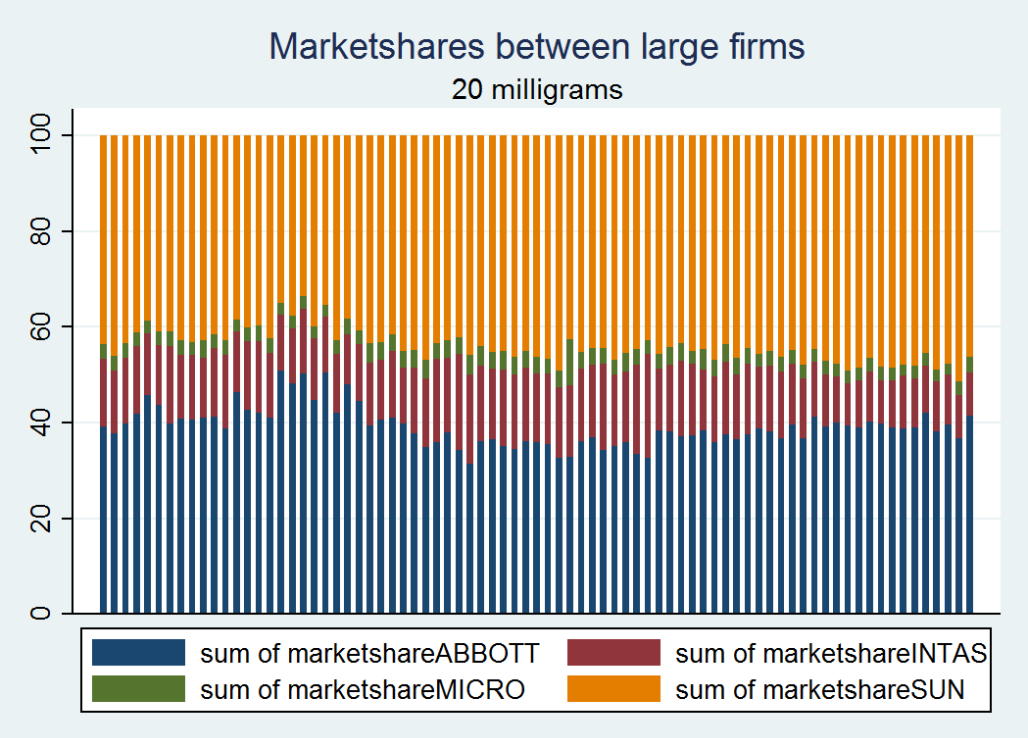
graph 6: market shares within group 1, 10 milligrams



graph 7: market shares of large firms (group1) vs small firms (group2), 20 milligrams



graph 8: market shares within group 1, 20 milligrams



The graphs are mostly self-explanatory, the y-axis notes the cumulative marketshare of the firms and the x-axis shows time. The legend shows which colours correspond to which company. Group 1 is the group of large firms that featured in the graphs in the previous section, group 2 is the rest of the market. Although it is somewhat difficult to see due to the scale, both the 10 milligram and the 20 milligram market show normal fluctuations in market share between the group of large firms and the rest of the market. Both markets also show fluctuation between the individual firms present in group 1, which suggests that they are competing normally and don't collude over market shares.

The wider market

Before we jump to the conclusions of this study we will return briefly to the other medicines in the dataset. The following section will summarize the results obtained from that analysis. Table 5 on the following page shows whether or not a hypothesis was accepted for every medicine in the dataset. There are 48 medicines in total, including isosorbide. The first column shows the name of the medicine, the 3 following columns shows if we can confirm the presence of the plus factor named in the column header. If a cell reads 'partial' it means that only one of the regressions pertaining to that plus factor rejects the null hypothesis, for example the regressions using maximum retailing price (MRP) as a dependant variable will show positive and statistically significant coefficients while the regression using price to retailer (PTR) does not. As discussed, the last column has many partials since it has four related regressions which may or may not reject the null. In table 6, below table 5 we list the same results but group them based on the merit we believe they have as the subjects of future studies into either collusion or the market in general. Isosorbide will be omitted as it already featured in this paper (although we certainly do

not want to give the impression that other researchers should not try to verify our results in any way).

Table 3: plus factor presence in the market

Medicine	Price elevation	Quantity restriction	Reduction of BR
Alprazolam	No	No	Partial
Amitriptyline	No	No	No
Amlodipine	Partial	No	No
Amoxycillin	No	No	No
Atenolol	No	Yes	No
Atorvastatin	No	No	No
Bromocriptine	No	No	No
Carbamazepine	No	No	Partial
Carbimazole	Yes	No	Partial
Cefalixin	Partial	No	Partial
Cefixime	No	No	Partial
Chlorambucil	Partial	No	No
Chlorpromazin	No	No	No
Danazol	Yes	No	No
Dexamathasone	No	No	No
Dextromethorphan	No	No	Partial
Diazepam	Yes	No	Partial
Diclofenac	Partial	No	Partial
Dicyclomine	No	Yes	Partial
Didanosine	no	no	no
Diltiazem	no	no	Partial
Enalapril	Yes	no	partial
Ethambutol	No	no	No
Etoposide	Yes	No	Partial
Famotidine	no	Yes	Partial
Fluoxetine	no	No	No
Griseofulvin	Yes	No	Partial
Hydrochlorothiazide	No	No	No
Ibuprofen	No	No	Partial
Isosorbide-5-mononitrate	Yes	Yes	Partial
Lamivudine	No	No	No
Lithium	Partial	Yes	Partial
Metformin	No	No	No
Methotrexate	Partial	No	Partial
Metoprolol	Yes	No	Partial
Ofloxacin	No	No	No
Olanzapine	No	No	Partial
Phenytoin	No	No	No
Propranolol	Partial	No	Partial

Pyridostigmine	No	No	Partial
Rifampicin	Yes	Yes	Partial
Salbutamol	No	No	Partial
Sodiumvalproate	Yes	No	No
Spironolactone	Yes	Yes	Partial
Tamoxifen	Insufficient obs	-	-
Terbutaline	No	Yes	Partial
Verapamil	No	No	Partial
Warfarin	No	No	Partial

Table 6: medicines by relevance for future research

Medicine	Price elevation	Quantity restriction	Reduction of BR
Triple plus factor			
Rifampicin	Yes	Yes	Partial
Spironolactone	Yes	Yes	Partial
Double plus factor			
Carbimazole	Yes	No	Partial
Diazepam	Yes	No	Partial
Griseofulvin	Yes	No	Partial
Lithium	Partial	Yes	Partial
Terbutaline	No	Yes	Partial

As mentioned before, Spironolactone is not suitable as the subject for a collusion study as the dosage under control is only sold by one company, for this reason however it would be perfect for a study into the effect of local monopolies in the this market. Rifampicin displays very similar characteristics to Isosorbide Mononitrate and would therefore be a prime candidate for a follow up case study like the one presented in this paper. The medicines under the "double plus factor" header do not display as many plus factors as the case study (or less strongly so, in the case of lithium) but still exhibit two out of three plus factors and also come with a small twist that makes them interesting in their own regard. We will go over each one briefly. Carbimazole strongly displays the problems of information asymmetry that we discussed on several occasions in this paper, the lower dosages completely dominate the sales figures compared to the high dosage and are well over 50% more expensive on top this. Something that is very worth noticing is that the price of the uncontrolled dosage shoots up very abruptly when the DPCO comes into effect and almost converges with the average price of the controlled dosages. Before the order was implemented some civil groups[8] brought forth concerns about a ceiling price possibly acting as a guideline for manufacturers and would thus end up increasing prices. Whether or not this is the reason for the rise in price we see here is a question that could be worth answering. Diazepam shows even stronger signs of information asymmetry, with the average price for controlled dosages more than doubling up on the price of uncontrolled dosages. Although this medicine did not test positive for the plus factor of *quantity restriction* it does exhibit falling sales figures for controlled dosages, with one dosage in particular (5mg) loses a lot of sales relative to the other dosages. Griseofulvin again shows information asymmetry. It does not test positive for *quantity restriction* as sales for the controlled variant remain high relative to the uncontrolled one, what's extra interesting here perhaps is the strongly increasing divergence in prices for this medicine,

[8] See http://pharmabiz.com/NewsDetails.aspx?aid=73532&sid=1 for more information on this.

both dosages cost around .006 rupees per milligram in 2007 but by 2013, after an initial decline in prices, the price for the controlled substance had risen to .007 rupees per milligram whereas the uncontrolled variant had *dropped* in price to about .0045 rupees per milligram, thus failing to recover from the initial price decline that both dosages exhibited. Prices across these dosages moving in the opposite direction gives a very strong suspicion that prices are not competitive for medicine and collusion may be at play. Lithium saw an expected result in the price regressions for MRP only and thus does not display a super plus factor. Prices to retailers are, in a break of tradition, very closely together across controlled and uncontrolled dosages. The dosage that was chosen to come under price control is not the dosage dominating in sales however, and the price of this dosage plummeted after the order came into effect while the price of uncontrolled dosages continued to rise. This medicine is probably interesting to include in an evaluation study that tests for the effectiveness of the DPCO, after all if the controlled dosage in this case is barely sold despite it having dropped in price than the effectiveness of the order can be disputed. Finally we have terbutaline. The results of this medicine's regression is not what makes it so interesting, but rather how the sales data are behaving. In 2012 the sales figures for this medicine dropped by well over 90% to near-zero and never recovered. Its closest substitute in the dataset used for this paper is salbutamol, which also saw a drop in sales figures around the same time. These medicines are used by asthma patients, an unlikely group of people to suddenly have no need for their medicines. It is obvious that demand has not disappeared for this sort of medicine, it simply shifted to a substitute. It should be noted that we do not have data on every asthma medicine available in the market so we are unsure where demand went. The fear we have is that firms have shifted production to an uncontrolled substitute in order to avoid price controls in this sub market. We think that the abrupt shift in demand as well as the reason for this shift to happen would be an interesting topic for future research. Finally a special mention should go out to Lamivudine, a

case that points to a weakness in the method we used and is discussed at the end of the next and final section.

Conclusion

The presence of the super plus factor of *price elevation* and *quantity restriction* combined is a very troubling one when observed in a market as discussed in the theory. The fact that three medicines in our dataset, including the case study, exhibited this super plus factor is therefore rather troubling and indicative of a market that is not fully competitive, which leaves room for the industry to come under further scrutiny in order to ensure that the general public can have access to affordable medicines and healthcare. That said and with the qualitative part of the case study in mind, it is too far of a stretch to conclude that explicit collusion is the cause for the relatively high prices and lower sales volumes of the controlled dosages of these medicines. One cause in particular which can't be ruled out is that these dosages, due to the sheer difference in sales volume have achieved higher market maturity compared to the uncontrolled dosages, and are associated with higher prices because firms are now trying to extract as much surplus as possible in order to cover the costs of future investments into new medicines. A simple coincidence whereby several firms just decided around the same time to increase prices just because they could do so and increase their profit is also possible, although perhaps less plausible when considered as the underlying cause for all three of the medicines which tested positive for the super plus factor. The reduction in sales in this scenario could be either the market reaction to higher prices or a shift to substitutes that are cheaper. Another point for the possible presence of collusion can be made when we take another look at Table 3 and note the number of medicines that test positive for *price elevation*. Given our choice of control group, which in combination with FE rules out so many confounding factors it is really hard to imagine what could cause these

results if not some form of collaboration by pharmaceutical firms, either explicit or implicit. In summary, while we can't prove collusion *exists* in the market, we have certainly become very sceptic about its *absence*. In either case though we can say that the Indian government has chosen wisely in bringing these drugs under a price control regime in order to combat such practices, if they exists. The apparent drop in prices for many of these controlled substances suggests that the DPCO of 2013 was effective at least in this regard. In order to further improve market conditions for consumers in India we suggest that future action by the Indian government also include some policy to improve the transparency of market prices of medicines. The fact that the most expensive variants of particular medicines are also completely dominating sales is indefensible and strongly suggests foul play of some sort and a complete failure of the industry to serve its social duty, as a medicine industry that acts in the interest of the general populace would never push generics that are *less* effective while costing *more* this hard. The most striking example, (the one already hinted at several times) is saved for the very end of this section.

As a final note we would like to point out a few limitations of this paper, which offer room for improvement in future work and indeed invite more research. First of all only one medicine out of the 48 was qualitatively analyzed, a process that is probably necessary given that the results from this part of the analysis contradicted the results of the quantitative part insofar as proving colluding behaviour goes. Future research with a broad scope would do well to develop this sort of analysis for a larger range of medicines. Secondly, while we believe that the method we used is very useful and can provide valid and meaningful results it fails to directly capture certain practices which don't fall under the typical notion of collusion or cartel-formation but are still unethical and should be discouraged strongly by governing bodies. To give an example of this relevant to the Indian pharmaceutical market we can return to the great lack of information that

customers in this market have about their product choice. Rather than actively selecting the product hey think is best they are instead told by their physician what to buy, the extreme situations this could lead to will be pointed out at the end of this paragraph. A manufacturer of medicine could in theory reach an agreement with retailers whereby they will only prescribe certain brands of medicine in exchange for some monetary reward. This will allow the manufacturer to keep the prices high without losing sales. Using the same method we used, the result would probably point at the presence of *price elevation* for these drugs, but not *quantity restriction*, as sales remain high. A researcher would be forced to conclude all is likely just fine given the absence of a super plus factor. This is a slight weakness of the method, as a vertical cartel such as that would require a different approach to prove. The collaboration in this case is after all not between a group of manufacturers but between a manufacturer and any number of retailers. This form of collusion is more likely to occur when regulation is low and private incentives are high, boxes that the Indian market certainly ticks. To provide a (possible) real life example of this, and to return to the extreme situations we talked about just a bit earlier we would like to point out the case of Lamivudine, one of the medicines in the data set. The results for the method are nothing spectacular, no plus factors are present. However a quick excursion into summary statistics for this medicine reveals that one dosage in which this medicine is sold only accounts for 11% of total sales, even though this dosage is selling for half the price while carrying 50% more active substance, thus equating to a weighted price of 1/3 of what the other dosage sells for. Lamivudine is used as an HIV-drug, inhibiting the virus that destroys anti-bodies. The reason we didn't talk about this medicine at all in the main text is twofold: firstly it probably deserves a paper focused just on this medicine and the reason for this extremely strange phenomenon surrounding its price and sales quantity, secondly the method we chose is not suitable for a unique situation like that, a specialized method would likely need to be developed.

This drug is perhaps the best candidate for a study that focuses not on collusion per se but on the information asymmetry in the pharmaceutical market and its effects, which in the case of an HIV-medicine may take the most dire form. In order to end on a slightly more positive note, we hope that this paper prompts further research into this area and helps to direct policy makers to giving this industry their full attention, thus paving the way for further intervention to help shape the market into one that best serves the consumer.

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Appendix A

The following hold for each table in the regression and is shown here once.

Robust standard errors in parentheses, Time and company-state FE not shown, errors clustered around company-state
*** p<0.01, ** p<0.05, * p<0.1

Legend for column numbers:

(1): weighted price to retailer

(2): weighted maximum retail price

(3): sales quantity

(4): Amount of increases in price to retailer

(5): amount of increases in maximum retailing price

(6): size of increases in price to retailer

(7) : size of increase in maximum retailing price

VARIABLES	(1) ALPRAZOLAM ptr	(2) ALPRAZOLAM mrp	(3) ALPRAZOLAM salesunits	(4) ALPRAZOLAM ptrincrease	(5) ALPRAZOLAM mrpincrease	(6) ALPRAZOLAM absincrease ptr	(7) ALPRAZOLAM absincrease mrp
dcontrol	1.550	1.881	6,417***	-0.0202***	-0.0214***	-0.00684	0.176
	(0)	(0)	(692.9)	(0.00299)	(0.00191)	(0)	(0)
p2xcontrol	0.0546	0.0775	-397.2	0.0207***	0.0306***	0.0286	-0.173
	(0)	(0)	(266.7)	(0.00416)	(0.00368)	(0)	(0)
p3xcontrol	-0.00861	0.276	300.3	0.0128**	0.0153***	0.00888	-0.204
	(0)	(0)	(374.2)	(0.00499)	(0.00348)	(0)	(0)
dslow	-0.0449	-0.0474	-6,192***	-0.00227	-0.00764***	-0.00373	0.0844
	(0)	(0)	(694.4)	(0.00179)	(0.00181)	(0)	(0)
Constant	2.301	2.849	-5,316***	0.0387***	0.0549***	0.0156	0.123
	(0)	(0)	(625.1)	(0.00266)	(0.00252)	(0)	(0)
Observations	120,547	120,547	120,833	120,387	120,387	120,387	8,001
R-squared	0.546	0.238	0.334	0.039	0.109	0.032	0.282

VARIABLES	(1) AMITRIPTYLINE ptr	(2) AMITRIPTYLINE mrp	(3) AMITRIPTYLINE salesunits	(4) AMITRIPTYLINE ptrincrease	(5) AMITRIPTYLINE mrpincrease	(6) AMITRIPTYLINE absincrease ptr	(7) AMITRIPTYLINE absincrease mrp
dcontrol	-0.0117***	-0.0150	885.0***	0.0216***	0.0175***	4.06e-05*	0.000159
	(0.000921)	(0)	(280.1)	(0.00362)	(0.00298)	(2.31e-05)	(0)
p2xcontrol	-0.00115	-0.000896	297.5	-0.0125***	-0.00483	-0.000300***	-0.00609
	(0.00100)	(0)	(234.9)	(0.00444)	(0.00619)	(8.51e-05)	(0)
p3xcontrol	-0.00405***	-0.0351	505.2*	-0.0292***	-0.0198***	-7.59e-05	-0.00116
	(0.00113)	(0)	(295.6)	(0.00392)	(0.00459)	(5.09e-05)	(0)
dslow	0.0616***	0.0768	10.46	5.88e-05	-0.00286	-0.000214***	-0.0152
	(0.0200)	(0)	(168.5)	(0.00549)	(0.00581)	(6.59e-05)	(0)
Constant	0.0518***	0.0755	-174.9	0.00387	0.0237***	0.000297***	0.0188
	(0.00108)	(0)	(276.4)	(0.00518)	(0.00320)	(6.07e-05)	(0)
Observations	50,404	50,404	50,404	50,265	50,265	50,265	4,410
R-squared	0.362	0.097	0.305	0.056	0.148	0.041	0.345

VARIABLES	(1) AMLODIPINE ptr	(2) AMLODIPINE mrp	(3) AMLODIPINE salesunits	(4) AMLODIPINE ptrincrease	(5) AMLODIPINE mrpincrease	(6) AMLODIPINE absincrease ptr	(7) AMLODIPINE absincrease mrp
dcontrol	0.129***	0.164***	7,129***	-0.0105***	-0.000538	0.000431***	0.0109
	(0.00424)	(0.00542)	(770.1)	(0.00301)	(0.00298)	(6.52e-05)	(0)
p2xcontrol	-0.00529	-0.00718*	345.2	-0.00857**	-0.0152***	-0.000539***	0.000815
	(0.00338)	(0.00419)	(244.9)	(0.00381)	(0.00392)	(0.000117)	(0)
p3xcontrol	0.00292	0.0186***	1,147***	0.00356	-0.00246	6.79e-05	0.0216
	(0.00384)	(0.00500)	(316.3)	(0.00328)	(0.00380)	(0.000141)	(0)
dslow	0.759***	0.926***	-13,376***	-0.0216***	-0.0322***	-9.60e-05	
	(0.182)	(0.225)	(1,709)	(0.00306)	(0.00363)	(0.000178)	
Constant	0.225***	0.278***	-6,344***	0.0378***	0.0215***	0.000136***	0.0452
	(0.00356)	(0.00458)	(751.4)	(0.00142)	(0.00163)	(4.37e-05)	(0)
Observations	144,150	144,150	144,150	144,150	144,150	144,150	11,446
R-squared	0.785	0.763	0.497	0.037	0.135	0.025	0.313

VARIABLES	(1) AMOXYCILLIN ptr	(2) AMOXYCILLIN mrp	(3) AMOXYCILLIN salesunits	(4) AMOXYCILLIN ptrincrease	(5) AMOXYCILLIN mrpincrease	(6) AMOXYCILLIN absincrease ptr	(7) AMOXYCILLIN absincrease mrp
dcontrol	-0.00258	-0.00314	1,352	0.0163	0.0195	-3.15e-05	-0.000335
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
p2xcontrol	-0.00147	-0.00200	-166.5	0.0137	0.0215	4.47e-05	-0.000167
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
p3xcontrol	-0.000218	-0.000567	244.1	0.0225	0.0110	4.27e-05	-0.000841
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
dslow	0.000514	0.000348	-651.7	-0.00318	0.00490	-3.94e-06	-0.000177
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Constant	0.0155	0.0199	-1,587	0.00532	0.00543	4.36e-05	0.00101
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Observations	124,994	124,994	125,206	120,907	120,907	120,907	10,101
R-squared	0.195	0.176	0.312	0.051	0.125	0.041	0.400

VARIABLES	(1) ATENOLOL ptr	(2) ATENOLOL mrp	(3) ATENOLOL salesunits	(4) ATENOLOL ptrincrease	(5) ATENOLOL mrpincrease	(6) ATENOLOL absincrease ptr	(7) ATENOLOL absincrease mrp
dcontrol	-0.0157*** (0.000740)	-0.0195*** (0.000919)	-1,097*** (371.1)	0.0160*** (0.00247)	0.0217*** (0.00244)	-7.75e-05*** (1.54e-05)	-0.00430*** (0.000558)
p2xcontrol	-0.000189 (0.000645)	-0.000463 (0.000796)	-306.3 (195.9)	0.00366 (0.00390)	-0.00870* (0.00459)	7.65e-05*** (1.95e-05)	0.00320*** (0.000559)
p3xcontrol	-0.00299*** (0.000772)	-0.00537*** (0.000994)	-528.6** (253.1)	-0.0121*** (0.00330)	-0.0135*** (0.00350)	-2.38e-05 (2.50e-05)	0.00220*** (0.000477)
dslow	0.0294*** (0.00244)	0.0457*** (0.00433)	-2,030*** (532.3)	0.0390** (0.0162)	-0.0167** (0.00685)	-4.61e-05** (2.07e-05)	
Constant	0.0330*** (0.000624)	0.0433*** (0.000799)	1,926*** (416.8)	-0.000104 (0.00150)	0.0331*** (0.00199)	8.84e-05*** (8.35e-06)	0.0100*** (0.000466)
Observations	84,340	84,340	84,340	84,340	84,340	84,340	6,191
R-squared	0.685	0.684	0.269	0.046	0.110	0.027	0.262

VARIABLES	(1) ATORVASTATIN ptr	(2) ATORVASTATIN mrp	(3) ATORVASTATIN salesunits	(4) ATORVASTATIN ptrincrease	(5) ATORVASTATIN mrpincrease	(6) ATORVASTATIN absincrease ptr	(7) ATORVASTATIN absincrease mrp
dcontrol	0.125 (0)	0.157 (0)	2,512 (0)	-0.00541 (0)	0.00455 (0)	0.000153 (0)	0.00251 (0)
p2xcontrol	0.0230 (0)	0.0286 (0)	-87.91 (0)	-0.00168 (0)	-0.0129 (0)	0.00138 (0)	0.0188 (0)
p3xcontrol	0.0469 (0)	0.0674 (0)	-182.2 (0)	0.00696 (0)	-0.000269 (0)	0.000320 (0)	0.0173 (0)
dslow	-0.173 (0)	-0.222 (0)	-5,713 (0)	-0.0245 (0)	0.0144 (0)	-0.00108 (0)	-0.0394 (0)
Constant	0.238 (0)	0.309 (0)	-2,328 (0)	-0.0254 (0)	-0.0308 (0)	-0.00204 (0)	0.0181 (0)
Observations	263,035	263,035	263,035	261,928	261,928	261,928	21,453
R-squared	0.613	0.609	0.352	0.056	0.138	0.021	0.296

VARIABLES	(1) BROMOCRIPTINE ptr	(2) BROMOCRIPTINE mrp	(3) BROMOCRIPTINE salesunits	(4) BROMOCRIPTINE ptrincrease	(5) BROMOCRIPTINE mrpincrease	(6) BROMOCRIPTINE absincrease ptr	(7) BROMOCRIPTINE absincrease mrp
dcontrol	-3.418***	-4.341***	-138.2***	0.0126***	0.0296***	0.000316	0.0581
	(0.0103)	(0.0119)	(51.19)	(0.00476)	(0.0112)	(0.00132)	(0)
p2xcontrol	-0.195***	-0.307***	179.4***	-0.0564***	0.00304	0.00941***	0.243
	(0.0257)	(0.0383)	(60.54)	(0.0157)	(0.00892)	(0.00341)	(0)
Constant	8.954***	11.40***	273.7***	0.148***	0.113***	0.0223***	0.0464
	(0.0191)	(0.0245)	(48.71)	(0.00513)	(0.0113)	(0.000842)	(0)
Observations	15,587	15,587	15,587	15,587	15,587	15,587	1,445
R-squared	0.833	0.832	0.638	0.184	0.255	0.103	0.555

VARIABLES	(1) CARBAMAZEPINE ptr	(2) CARBAMAZEPINE mrp	(3) CARBAMAZEPINE salesunits	(4) CARBAMAZEPINE ptrincrease	(5) CARBAMAZEPINE mrpincrease	(6) CARBAMAZEPINE absincrease ptr	(7) CARBAMAZEPINE absincrease mrp
dcontrol	0.000317***	0.000356***	7,433***	-0.00313	-0.0170***	3.75e-06**	0.000239***
	(7.92e-05)	(9.29e-05)	(1,046)	(0.00341)	(0.00315)	(1.82e-06)	(7.16e-05)
p2xcontrol	-0.000128*	-0.000134	482.3	-0.00166	0.0265***	1.02e-05***	-3.39e-05
	(6.95e-05)	(8.26e-05)	(374.6)	(0.00376)	(0.00327)	(3.90e-06)	(8.04e-05)
p3xcontrol	-0.000313***	-0.000272***	725.6	-0.00936**	-0.00529	-8.21e-06***	-6.59e-05
	(7.79e-05)	(9.32e-05)	(464.5)	(0.00399)	(0.00419)	(2.22e-06)	(8.46e-05)
dslow	0.000303***	0.000381***	-4,730***	-0.00453***	0.00993***	1.83e-06	-0.000158***
	(1.83e-05)	(2.14e-05)	(840.8)	(0.00170)	(0.00139)	(1.70e-06)	(6.00e-05)
Constant	0.00714***	0.00886***	-4,752***	0.0332***	0.0266***	3.69e-06*	0.000828**
	(8.78e-05)	(0.000102)	(1,215)	(0.00362)	(0.00358)	(1.88e-06)	(0.000368)
Observations	62,903	62,903	62,903	51,700	51,700	51,700	2,573
R-squared	0.312	0.330	0.419	0.072	0.181	0.041	0.500

VARIABLES	(1) CARBIMAZOLE ptr	(2) CARBIMAZOLE mrp	(3) CARBIMAZOLE salesunits	(4) CARBIMAZOLE ptrincrease	(5) CARBIMAZOLE mrpincrease	(6) CARBIMAZOLE absincrease ptr	(7) CARBIMAZOLE absincrease mrp
dcontrol	0.0654***	0.0812***	712.9***	-0.0399***	-0.00465	-0.000172***	-0.00709***
	(0.00169)	(0.00206)	(161.1)	(0.00327)	(0.00473)	(5.55e-05)	(0.00151)
p2xcontrol	0.00139	0.00241**	-55.74	-0.0314***	-0.0268***	3.63e-05	-0.00140
	(0.000954)	(0.00108)	(86.75)	(0.00687)	(0.00383)	(0.000108)	(0.00149)
	(0.00117)	(0.00190)	(101.9)	(0.00417)	(0.00563)	(0.000114)	(0.00247)
p3xcontrol	0.00671***	0.00434***	93.35	0.0650***	0.0143**	0.000833***	0.000619
Constant	0.200***	0.289***	-402.4***	0.130***	0.124***	0.00110***	0.0637***
	(0.00103)	(0.000823)	(95.49)	(0.00130)	(0.00225)	(1.75e-05)	(0.00272)
Observations	15,505	15,505	15,505	15,505	15,505	15,505	1,621
R-squared	0.807	0.659	0.452	0.186	0.276	0.123	0.426

VARIABLES	(1) CEFALEXIN ptr	(2) CEFALEXIN mrp	(3) CEFALEXIN salesunits	(4) CEFALEXIN ptrincrease	(5) CEFALEXIN mrpincrease	(6) CEFALEXIN absincrease ptr	(7) CEFALEXIN absincrease mrp
dcontrol	0.000432**	0.000414*	910.5***	-0.00648**	0.0161***	6.67e-06	-7.71e-05
	(0.000181)	(0.000229)	(213.1)	(0.00300)	(0.00343)	(5.86e-06)	(7.37e-05)
p2xcontrol	5.02e-05	0.000224	1.405	0.0244***	0.0359***	3.84e-05***	0.000316
	(0.000164)	(0.000219)	(72.02)	(0.00399)	(0.00438)	(1.36e-05)	(0.000250)
p3xcontrol	6.91e-05	0.00115***	126.2	0.0311***	0.00539	1.69e-05*	0.000894***
	(0.000222)	(0.000313)	(126.5)	(0.00570)	(0.00553)	(9.53e-06)	(0.000223)
dslow	0.00257***	0.00311***	-359.7***	-0.0183***	-0.00885**	4.40e-05***	0.000401**
	(0.000254)	(0.000319)	(115.8)	(0.00204)	(0.00376)	(9.94e-06)	(0.000189)
Constant	0.0199***	0.0251***	-991.0***	-0.00967*	-0.0228***	-0.000101***	0.00172***
	(0.000229)	(0.000299)	(259.5)	(0.00513)	(0.00411)	(3.01e-05)	(0.000386)
Observations	73,486	73,486	73,486	69,696	69,696	69,696	6,750
R-squared	0.748	0.707	0.453	0.076	0.123	0.038	0.314

VARIABLES	(1) CEFIXIME ptr	(2) CEFIXIME mrp	(3) CEFIXIME salesunits	(4) CEFIXIME ptrincrease	(5) CEFIXIME mrpincrease	(6) CEFIXIME absincrease ptr	(7) CEFIXIME absincrease mrp
dcontrol	-0.00983	-0.0129	2,726	0.000247	0.0131***	1.83e-05	-0.00363
	(0)	(0)	(0)	(0.00244)	(0.00237)	(0)	(0)
p2xcontrol	0.00113	0.00154	-182.1	0.0146***	0.0142***	5.05e-05	0.0265
	(0)	(0)	(0)	(0.00312)	(0.00325)	(0)	(0)
p3xcontrol	0.00104	0.00440	118.4	0.00581**	-0.0105***	-1.34e-05	0.0332
	(0)	(0)	(0)	(0.00247)	(0.00246)	(0)	(0)
dslow	0.00107	-0.00191	-1,025	-0.00290*	-0.00672***	-3.14e-05	-0.0193
	(0)	(0)	(0)	(0.00157)	(0.00129)	(0)	(0)
Constant	0.0601	0.0764	-2,413	-0.00812***	-0.00424*	-0.000106	0.0135
	(0)	(0)	(0)	(0.00264)	(0.00250)	(0)	(0)
Observations	244,982	244,982	246,358	243,117	243,117	243,117	15,156
R-squared	0.550	0.185	0.465	0.054	0.209	0.011	0.547

VARIABLES	(1) CHLORAMBUCIL ptr	(2) CHLORAMBUCIL mrp	(3) CHLORAMBUCIL salesunits	(4) CHLORAMBUCIL ptrincrease	(5) CHLORAMBUCIL mrpincrease	(6) CHLORAMBUCIL absincrease ptr	(7) CHLORAMBUCIL absincrease mrp
dcontrol	7.155***	8.532***	-0.507	-0.0399	-0.0398	-0.0360*	-0.290
	(0.0284)	(0.0334)	(0.775)	(0.0232)	(0.0236)	(0.0194)	(0)
p2xcontrol	0.109**	0.118**	-0.323	0.108***	0.0713**	0.219***	
	(0.0411)	(0.0489)	(1.618)	(0.0343)	(0.0247)	(0.0429)	
p3xcontrol	-0.216***	0.204***	-0.476	-0.000968	0.00606	0.0305	1.043
	(0.0303)	(0.0405)	(1.806)	(0.0255)	(0.0281)	(0.0195)	(0)
Constant	4.066***	5.156***	2.967	-0.395**	-0.362**	-0.799***	1.370
	(0.137)	(0.161)	(4.063)	(0.139)	(0.138)	(0.226)	(0)
Observations	548	548	548	548	548	548	28
R-squared	0.974	0.979	0.948	0.412	0.511	0.353	1.000

VARIABLES	(1) CHLORPROMAZINE ptr	(2) CHLORPROMAZINE mrp	(3) CHLORPROMAZINE salesunits	(4) CHLORPROMAZINE ptrincrease	(5) CHLORPROMAZINE mrpincrease	(6) CHLORPROMAZINE absincreaseptr	(7) CHLORPROMAZINE absincreasemrp
dcontrol	-0.000356	-2.13e-05	-46.47	0.00211	-0.00755	-1.53e-05	0.00226
	(0.00141)	(0.00175)	(649.2)	(0.00687)	(0.00507)	(4.69e-05)	(0.0106)
p2xcontrol	-0.0257***	-0.0326***	4,489*	0.0268*	0.0211	-0.000116	0.0150
	(0.00705)	(0.00894)	(2,497)	(0.0158)	(0.0209)	(0.000285)	(0.0110)
p3xcontrol	-0.0313***	-0.0444***	4,469*	-0.00499	0.0121	-0.000133	0.00666
	(0.00643)	(0.00915)	(2,402)	(0.0107)	(0.0119)	(0.000102)	(0.00703)
Constant	0.0164***	0.0213***	2,239*	0.0190***	0.0352***	7.41e-05	0.00291
	(0.00279)	(0.00360)	(1,179)	(0.00396)	(0.00337)	(5.18e-05)	(0.00506)
Observations	10,809	10,809	10,809	10,423	10,423	10,423	426
R-squared	0.313	0.317	0.567	0.102	0.114	0.067	0.525

VARIABLES	(1) DANAZOL ptr	(2) DANAZOL mrp	(3) DANAZOL salesunits	(4) DANAZOL ptrincrease	(5) DANAZOL mrpincrease	(6) DANAZOL absincreaseptr	(7) DANAZOL absincreasemrp
dcontrol	0.0301***	0.0374***	136.8***	-0.00310	0.0103	1.96e-05	0.000887**
	(0.000626)	(0.000769)	(34.36)	(0.00531)	(0.00629)	(4.52e-05)	(0.000423)
p2xcontrol	0.00582***	0.00738***	-2.315	0.0232***	0.00417	0.000474***	0.00174
	(0.000427)	(0.000548)	(17.23)	(0.00883)	(0.0102)	(0.000125)	(0.00186)
p3xcontrol	0.0111***	0.0156***	15.46	-0.00766	-0.0209***	0.000138	-0.00118
	(0.00119)	(0.00153)	(17.94)	(0.00767)	(0.00584)	(0.000117)	(0.000803)
Constant	0.102***	0.122***	-64.54**	0.0798***	0.0964***	0.000672***	0.00165*
	(0.00227)	(0.00206)	(27.79)	(0.00325)	(0.00249)	(3.28e-05)	(0.000852)
Observations	24,579	24,579	24,579	24,579	24,579	24,579	2,438
R-squared	0.842	0.846	0.560	0.114	0.182	0.064	0.480

VARIABLES	(1) DEXAMETHASONE ptr	(2) DEXAMETHASONE mrp	(3) DEXAMETHASONE salesunits	(4) DEXAMETHASONE ptrincrease	(5) DEXAMETHASONE mrpincrease	(6) DEXAMETHASONE absincrease ptr	(7) DEXAMETHASONE absincrease mrp
dcontrol	0.0259	0.0323	157,275***	-0.0214***	-0.00535	-0.0135**	0.302***
	(0.0288)	(0.0365)	(38,928)	(0.00269)	(0.00651)	(0.00547)	(0.0669)
p2xcontrol	-0.0406	-0.0459	35,849***	0.0122***	-0.00605	-0.00527	-0.698***
	(0.0267)	(0.0316)	(10,628)	(0.00405)	(0.00515)	(0.00638)	(0.235)
p3xcontrol	-0.0163	-0.0805	68,002	-0.0167**	-0.0247***	0.00895	0.892
	(0.0449)	(0.0557)	(44,029)	(0.00710)	(0.00609)	(0.00597)	(0.902)
Constant	0.810***	0.987***	-2,701	0.0279***	-0.0124**	0.00409*	0.149
	(0.0166)	(0.0200)	(5,081)	(0.00397)	(0.00538)	(0.00212)	(0.146)
Observations	14,696	14,696	14,696	14,137	14,137	14,137	414
R-squared	0.122	0.118	0.142	0.109	0.098	0.040	0.743

VARIABLES	(1) DEXTROMETHORPHAN ptr	(2) DEXTROMETHORPHAN mrp	(3) DEXTROMETHORPHAN salesunits	(4) DEXTROMETHORPHAN ptrincrease	(5) DEXTROMETHORPHAN mrpincrease	(6) DEXTROMETHORPHAN absincrease ptr	(7) DEXTROMETHORPHAN absincrease mrp
dcontrol	-0.0121***	-0.0147***	-839.3***	-0.0558***	-0.0550***	-0.000781***	-0.0117
	(0.00132)	(0.00169)	(49.37)	(0.0156)	(0.0154)	(0.000176)	
p2xcontrol	-0.00267	-0.00306	380.9***	0.155***	0.187***	0.00178***	
	(0.00246)	(0.00350)	(40.24)	(0.0232)	(0.0259)	(0.000289)	
p3xcontrol	-0.00518*	-0.0102***	513.9***	0.0826***	0.0800***	9.08e-05	0.00687***
	(0.00250)	(0.00336)	(177.5)	(0.0185)	(0.0142)	(0.000208)	(0.000263)
Constant	0.175***	0.221***	-8.592	0.0267***	0.0566***	0.000260***	0.0151***
	(0.00172)	(0.00224)	(37.94)	(0.00615)	(0.00506)	(7.98e-05)	(0.000341)
Observations	1,361	1,361	1,361	1,361	1,361	1,361	87
R-squared	0.338	0.395	0.511	0.414	0.562	0.298	0.941

VARIABLES	(1) DIAZEPAM ptr	(2) DIAZEPAM mrp	(3) DIAZEPAM salesunits	(4) DIAZEPAM ptrincrease	(5) DIAZEPAM mrpincrease	(6) DIAZEPAM absincrease ptr	(7) DIAZEPAM absincrease mrp
dcontrol	0.222***	0.278***	1,331***	-0.0123	0.0226***	0.00169***	-0.0107*
	(0.00845)	(0.00988)	(379.5)	(0.00769)	(0.00805)	(0.000394)	(0.00628)
p2xcontrol	0.0245***	0.0313***	-376.8	0.00279	-0.0600***	-0.000341	0.0362***
	(0.00550)	(0.00665)	(262.5)	(0.0123)	(0.0182)	(0.000546)	(0.00953)
p3xcontrol	0.0332***	0.0593***	-299.9	0.0219**	-0.0252**	-0.00124***	0.0109*
	(0.00785)	(0.00939)	(354.9)	(0.00862)	(0.00999)	(0.000437)	(0.00552)
Constant	-0.193***	-0.232***	-195.0	0.00436	0.0251**	-0.000330	0.0250***
	(0.00909)	(0.0109)	(375.0)	(0.0151)	(0.0102)	(0.000348)	(0.00624)
Observations	21,446	21,446	21,446	21,446	21,446	21,446	1,626
R-squared	0.645	0.648	0.660	0.091	0.148	0.084	0.717

VARIABLES	(1) DICLOFENAC ptr	(2) DICLOFENAC mrp	(3) DICLOFENAC salesunits	(4) DICLOFENAC ptrincrease	(5) DICLOFENAC mrpincrease	(6) DICLOFENAC absincrease ptr	(7) DICLOFENAC absincrease mrp
dcontrol	0.00218***	0.00255***	-2,781***	-0.0219***	-0.000579	0.000186***	0.00351
	(0.000390)	(0.000470)	(589.7)	(0.00501)	(0.00641)	(4.72e-05)	(0)
p2xcontrol	-0.000110	0.000217	-98.60	0.00676*	-0.00877*	1.61e-06	0.000220
	(0.000176)	(0.000215)	(182.0)	(0.00388)	(0.00456)	(2.06e-05)	(0)
p3xcontrol	-0.000489	0.00115***	10.91	0.0292***	0.00231	0.000127***	0.00335
	(0.000319)	(0.000407)	(273.8)	(0.00328)	(0.00446)	(2.45e-05)	(0)
dslow	0.00197***	0.00248***	-3,177***	0.0195***	0.0228***	0.000238***	0.00283
	(0.000436)	(0.000498)	(642.0)	(0.00607)	(0.00639)	(4.87e-05)	(0)
Constant	0.0142***	0.0183***	3,288***	0.126***	0.113***	0.000461***	0.00274
	(0.000365)	(0.000451)	(624.7)	(0.00516)	(0.00611)	(5.61e-05)	(0)
Observations	74,544	74,544	74,544	73,963	73,963	73,963	6,583
R-squared	0.895	0.888	0.358	0.061	0.128	0.036	0.352

VARIABLES	(1) DICYCLOMINE ptr	(2) DICYCLOMINE mrp	(3) DICYCLOMINE salesunits	(4) DICYCLOMINE ptrincrease	(5) DICYCLOMINE mrpincrease	(6) DICYCLOMINE absincrease ptr	(7) DICYCLOMINE absincrease mrp
dcontrol	0.0799***	0.103***	304.9	0.00317	-0.0302		
	(9.04e-05)	(0.000291)	(183.4)	(0.00407)	(0.0409)		
p2xcontrol	0.000223	-0.00739***	-747.6***	-0.0118	0.112***		
	(0.000335)	(0.000314)	(228.8)	(0.00906)	(0.0344)		
Constant	0.0597***	0.0757***	1,128***	0.0344***	0.0621	4.90e-05	0.00571
	(0.000398)	(0.000322)	(235.6)	(0.00990)	(0.0440)	(0)	(0)
Observations	204	204	204	204	204	204	7
R-squared	0.995	0.997	0.924	0.917	0.914	1.000	1.000

VARIABLES	(1) DIDANOSINE ptr	(2) DIDANOSINE mrp	(3) DIDANOSINE salesunits	(4) DIDANOSINE ptrincrease	(5) DIDANOSINE mrpincrease	(6) DIDANOSINE absincrease ptr	(7) DIDANOSINE absincrease mrp
dcontrol	-0.0137	-0.0172	-19.29	0.0213	0.0223	9.88e-06	
	(0)	(0)	(0)	(0)	(0)	(0)	
p2xcontrol	-0.0640	-0.0801	8.857	-0.0502	-0.0508	-0.000188	
	(0)	(0)	(0)	(0)	(0)	(0)	
dslow	-0.0126	-0.0157	1,795	-0.0454	-0.0442	-0.000143	
	(0)	(0)	(0)	(0)	(0)	(0)	
Constant	0.128	0.161	27.16	0.0724	0.0766	0.000364	0.0197
	(0)	(0)	(0)	(0)	(0)	(0)	(0.0181)
Observations	1,368	1,368	1,368	1,368	1,368	1,368	52
R-squared	0.214	0.217	0.495	0.493	0.502	0.056	0.180

VARIABLES	(1) DILTIAZEM ptr	(2) DILTIAZEM mrp	(3) DILTIAZEM salesunits	(4) DILTIAZEM ptrincrease	(5) DILTIAZEM mrpincrease	(6) DILTIAZEM absincrease ptr	(7) DILTIAZEM absincrease mrp
dcontrol	0.0117	0.0144***	4,033***	-0.0371***	-0.0456***	-7.50e-05***	0.000634**
	(0)	(0.000986)	(837.0)	(0.00245)	(0.00347)	(1.49e-05)	(0.000280)
p2xcontrol	-0.00150	-0.00136**	64.69	0.0354***	0.0299***	0.000167***	-0.000295
	(0)	(0.000586)	(81.70)	(0.00448)	(0.00525)	(1.46e-05)	(0.000253)
p3xcontrol	-0.000311	-0.000368	-131.8	0.0277***	0.0190***	0.000131***	0.00216***
	(0)	(0.000916)	(132.1)	(0.00487)	(0.00420)	(3.45e-05)	(0.000573)
dslow	0.00156	0.00219**	4,030***	-0.0126***	-0.0167***	-1.32e-05	-0.00105***
	(0)	(0.000988)	(807.8)	(0.00248)	(0.00328)	(1.70e-05)	(0.000367)
Constant	0.0498	0.0646***	-4,017***	0.0489***	0.0762***	0.000220***	0.00667***
	(0)	(0.000766)	(809.1)	(0.00450)	(0.00493)	(1.76e-05)	(0.000394)
Observations	51,418	51,418	51,418	51,418	51,418	51,418	4,935
R-squared	0.806	0.812	0.473	0.077	0.111	0.052	0.333

VARIABLES	(1) ENALAPRIL ptr	(2) ENALAPRIL mrp	(3) ENALAPRIL salesunits	(4) ENALAPRIL ptrincrease	(5) ENALAPRIL mrpincrease	(6) ENALAPRIL absincrease ptr	(7) ENALAPRIL absincrease mrp
dcontrol	0.136***	0.166***	4,490***	-0.00422	-0.0263***	0.00182***	0.0336***
	(0.00337)	(0.00437)	(623.0)	(0.00413)	(0.00326)	(0.000227)	(0.00289)
p2xcontrol	0.0114***	0.0128***	-42.55	-0.0627***	-0.0194***	-0.00161***	-0.0185***
	(0.00250)	(0.00350)	(255.3)	(0.00611)	(0.00660)	(0.000247)	(0.00338)
p3xcontrol	0.0250***	0.0566***	21.89	0.000815	0.0323***	-0.000572**	0.0101*
	(0.00296)	(0.00481)	(398.1)	(0.00492)	(0.00436)	(0.000232)	(0.00591)
Constant	0.00815**	0.0268***	-4,190***	0.0383***	0.0778***	-0.000935***	0.103***
	(0.00391)	(0.00513)	(783.3)	(0.00391)	(0.00913)	(0.000157)	(0.00544)
Observations	44,152	44,152	44,152	44,152	44,152	44,152	4,008
R-squared	0.663	0.511	0.330	0.077	0.167	0.039	0.531

VARIABLES	(1) ETHAMBUTOL ptr	(2) ETHAMBUTOL mrp	(3) ETHAMBUTOL salesunits	(4) ETHAMBUTOL ptrincrease	(5) ETHAMBUTOL mrpincrease	(6) ETHAMBUTOL absincrease ptr	(7) ETHAMBUTOL absincrease mrp
dcontrol	0.000266*** (3.34e-05)	0.000327*** (4.08e-05)	523.9*** (96.81)	-0.00922 (0.00588)	0.00934* (0.00510)	-6.51e-07 (8.14e-07)	-2.66e-05*** (8.47e-06)
p2xcontrol	-0.000151*** (6.11e-05)	-0.000197*** (7.32e-05)	22.56 (73.94)	-0.00859 (0.00550)	-0.0307*** (0.00705)	-5.29e-07 (1.92e-06)	0.000141*** (1.92e-05)
p3xcontrol	-0.000143*** (3.13e-05)	-0.000171*** (3.61e-05)	9.566 (120.7)	-0.000843 (0.00716)	-0.0157** (0.00687)	-1.75e-06 (1.59e-06)	0.000120*** (8.89e-06)
Constant	0.00458*** (1.84e-05)	0.00549*** (2.49e-05)	-49.03 (72.09)	0.00354* (0.00182)	0.0138*** (0.00177)	2.97e-06*** (5.47e-07)	0.000622*** (9.77e-05)
Observations	37,966	37,966	37,966	37,966	37,966	37,966	2,122
R-squared	0.417	0.438	0.482	0.061	0.225	0.077	0.883

VARIABLES	(1) ETOPOSIDE ptr	(2) ETOPOSIDE mrp	(3) ETOPOSIDE salesunits	(4) ETOPOSIDE ptrincrease	(5) ETOPOSIDE mrpincrease	(6) ETOPOSIDE absincrease ptr	(7) ETOPOSIDE absincrease mrp
dcontrol	0.0236 (0.0323)	0.0284 (0.0383)	-2.757 (6.940)	0.0578*** (0.0167)	0.0586*** (0.0162)	0.00811** (0.00387)	-0.182* (0.0927)
p2xcontrol	0.263 (0.190)	0.319 (0.226)	43.44 (31.71)	0.113* (0.0603)	0.177*** (0.0574)	0.000911 (0.0138)	
p3xcontrol	0.126*** (0.0362)	0.0761* (0.0433)	-4.280 (11.06)	-0.147*** (0.0160)	0.00394 (0.0233)	-0.00986** (0.00461)	
Constant	1.079*** (0.0133)	1.306*** (0.0158)	7.352* (3.685)	0.137*** (0.0191)	0.130*** (0.0184)	0.0130*** (0.00246)	0.166*** (0.0219)
Observations	506	506	506	506	506	506	45
R-squared	0.852	0.849	0.711	0.593	0.552	0.728	0.965

VARIABLES	(1) FAMOTIDINE ptr	(2) FAMOTIDINE mrp	(3) FAMOTIDINE salesunits	(4) FAMOTIDINE ptrincrease	(5) FAMOTIDINE mrpincrease	(6) FAMOTIDINE absincrease ptr	(7) FAMOTIDINE absincrease mrp
dcontrol	0.00675***	0.00876***	-242.8	-0.0327***	-0.0392***	-0.000192***	0.00969*
	(0.00159)	(0.00200)	(1,098)	(0.00448)	(0.00348)	(2.50e-05)	(0.00525)
p2xcontrol	-0.00319	-0.00435	-7,639***	0.0153***	0.0595***	0.000224***	-0.0134
	(0.00276)	(0.00346)	(1,786)	(0.00547)	(0.00620)	(6.81e-05)	(0.0101)
p3xcontrol	-0.000985	-5.21e-05	-14,819***	0.0250***	0.0440***	0.000112***	-0.00218
	(0.00249)	(0.00310)	(3,139)	(0.00443)	(0.00516)	(2.49e-05)	(0.00167)
dslow			3,761**	-0.0407***	-0.0288***	-2.57e-05	
			(1,652)	(0.00344)	(0.00279)	(2.51e-05)	
Constant	0.00567***	0.00711***	3,516***	0.0545***	0.0407***	5.82e-05***	-0.0299***
	(0.000812)	(0.00101)	(844.7)	(0.00281)	(0.00262)	(2.00e-05)	(0.00857)
Observations	24,383	24,383	24,498	24,384	24,384	24,384	696
R-squared	0.691	0.691	0.641	0.091	0.101	0.075	0.971

VARIABLES	(1) FLUOXETINE ptr	(2) FLUOXETINE mrp	(3) FLUOXETINE salesunits	(4) FLUOXETINE ptrincrease	(5) FLUOXETINE mrpincrease	(6) FLUOXETINE absincrease ptr	(7) FLUOXETINE absincrease mrp
dcontrol	0.0106	0.0135	2,462***	0.0120**	0.0294***	8.96e-05***	-0.00261***
	(0)	(0)	(258.8)	(0.00607)	(0.00518)	(2.68e-05)	(0.000599)
p2xcontrol	0.00138	0.00177	55.65	0.00601	-0.0187***	5.46e-05	0.00575***
	(0)	(0)	(78.24)	(0.00543)	(0.00446)	(8.98e-05)	(0.000741)
p3xcontrol	0.00351	0.00221	228.9*	0.0102	-0.0386***	0.000100**	0.00215*
	(0)	(0)	(125.1)	(0.00754)	(0.00541)	(4.76e-05)	(0.00110)
Constant	0.112	0.139	-2,383***	-0.000744	0.0219***	-0.000136	-0.00121
	(0)	(0)	(253.1)	(0.00925)	(0.00683)	(0.000137)	(0.0227)
Observations	38,421	38,421	38,421	38,421	38,421	38,421	3,462
R-squared	0.629	0.626	0.459	0.063	0.148	0.053	0.688

VARIABLES	(1) GRISEOFULVIN ptr	(2) GRISEOFULVIN mrp	(3) GRISEOFULVIN salesunits	(4) GRISEOFULVIN ptrincrease	(5) GRISEOFULVIN mrpincrease	(6) GRISEOFULVIN absincreaseptr	(7) GRISEOFULVIN absincreasemrp
dcontrol	0.000539	0.000579	-558.2**	0.00558	-0.00250	-1.27e-05**	-0.000717
	(0.000394)	(0)	(277.8)	(0.00407)	(0)	(5.17e-06)	(0)
p2xcontrol	0.00149***	0.00169	927.8	-0.0280***	-0.0708	-2.78e-06	-3.40e-05
	(0.000342)	(0)	(594.2)	(0.00539)	(0)	(8.24e-06)	(0)
p3xcontrol	0.00182***	0.00410	4,230***	-0.0519***	0.0742	-1.41e-05***	
	(0.000392)	(0)	(1,543)	(0.00590)	(0)	(4.09e-06)	
Constant	0.00738***	0.00935	-576.3	0.0281***	0.0440	3.10e-05***	0.00726
	(0.000485)	(0)	(401.9)	(0.00458)	(0)	(5.50e-06)	(0)
Observations	10,192	10,192	10,192	10,171	10,171	10,171	492
R-squared	0.113	0.093	0.354	0.180	0.194	0.068	1.000

VARIABLES	(1) HYDROCHLOROTHIAZIDE ptr	(2) HYDROCHLOROTHIAZIDE mrp	(3) HYDROCHLOROTHIAZIDE salesunits	(4) HYDROCHLOROTHIAZIDE ptrincrease	(5) HYDROCHLOROTHIAZIDE mrpincrease	(6) HYDROCHLOROTHIAZIDE absincreaseptr	(7) HYDROCHLOROTHIAZIDE absincreasemrp
dcontrol	-0.00867	-0.0111	-2,028	0.0284	0.0357	-2.38e-05	0.00302
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
p2xcontrol	-0.00303	-0.00332	-541.0	-0.0163	-0.0478	0.000378	0.000616
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
p3xcontrol	-0.00589	-0.00831	-1,186	0.0176	-0.0110	8.07e-05	-0.00524
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Constant	0.0727	0.0918	7,023	0.0373	0.0751	0.000185	0.00597
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Observations	19,216	19,216	19,216	19,216	19,216	19,216	1,379
R-squared	0.729	0.682	0.629	0.086	0.172	0.093	0.656

VARIABLES	(1) IBUPROFEN ptr	(2) IBUPROFEN mrp	(3) IBUPROFEN salesunits	(4) IBUPROFEN ptrincrease	(5) IBUPROFEN mrpincrease	(6) IBUPROFEN absincrease ptr	(7) IBUPROFEN absincrease mrp
dcontrol	0.000399*** (2.64e-05)	0.000451*** (4.58e-05)	5,592*** (1,531)	0.00855** (0.00341)	-0.0397*** (0.00443)	2.26e-06 (4.86e-06)	-2.52e-05 (0.000115)
p2xcontrol	-0.000156*** (4.19e-05)	-0.000223*** (5.40e-05)	917.5 (1,068)	-0.0275*** (0.00778)	0.0212*** (0.00617)	3.99e-05 (3.75e-05)	0.000253 (0.000206)
p3xcontrol	-4.31e-05 (4.39e-05)	0.000102 (0.000115)	4,496*** (1,502)	-0.00372 (0.00606)	0.0170*** (0.00607)	8.30e-08 (3.52e-06)	0.000498*** (0.000174)
dslow	0.00100*** (2.06e-05)	0.00116*** (2.49e-05)	-15,546*** (1,351)	-0.0543*** (0.00384)	-0.107*** (0.00640)	-1.64e-05* (9.05e-06)	
Constant	0.00143*** (1.05e-05)	0.00181*** (1.22e-05)	11,698*** (1,037)	0.0555*** (0.00158)	0.0746*** (0.00183)	6.25e-06 (6.62e-06)	0.000413*** (4.80e-05)
Observations	19,038	19,038	19,038	18,495	18,495	18,495	882
R-squared	0.628	0.614	0.198	0.111	0.173	0.017	0.991

VARIABLES	(1) ISOSORBIDE-5-MONONITRATE ptr	(2) ISOSORBIDE-5-MONONITRATE mrp	(3) ISOSORBIDE-5-MONONITRATE salesunits	(4) ISOSORBIDE-5-MONONITRATE ptrincrease	(5) ISOSORBIDE-5-MONONITRATE mrpincrease	(6) ISOSORBIDE-5-MONONITRATE absincrease ptr	(7) ISOSORBIDE-5-MONONITRATE absincrease mrp
dcontrol	0.0415*** (0.00173)	0.0532*** (0.00220)	2,826*** (429.8)	-0.0405*** (0.00353)	-0.0350*** (0.00367)	3.24e-05 (2.15e-05)	0.00969*** (0.000706)
p2xcontrol	0.000830 (0.000570)	0.00125* (0.000751)	-236.7* (140.9)	-0.00517 (0.00352)	-0.00971*** (0.00456)	-0.000204*** (4.60e-05)	-0.00393*** (0.000439)
p3xcontrol	0.00247*** (0.000761)	0.00287* (0.00154)	-705.8*** (197.2)	0.0195*** (0.00355)	0.00723* (0.00410)	0.000111*** (3.04e-05)	-0.00843*** (0.00294)
dslow	-0.00449*** (0.00159)	-0.00534*** (0.00200)	1,343*** (204.8)	-0.00851*** (0.00321)	-0.0281*** (0.00328)	-4.55e-05** (1.80e-05)	0.00112* (0.000641)
Constant	0.0486*** (0.00195)	0.0642*** (0.00242)	-2,227*** (388.8)	0.0485*** (0.00453)	0.0563*** (0.00490)	0.000218*** (3.48e-05)	0.0144*** (0.00155)
Observations	92,899	92,899	92,952	90,922	90,922	90,922	8,396
R-squared	0.764	0.704	0.301	0.048	0.106	0.029	0.270

VARIABLES	(1) LAMIVUDINE ptr	(2) LAMIVUDINE mrp	(3) LAMIVUDINE salesunits	(4) LAMIVUDINE ptrincrease	(5) LAMIVUDINE mrpincrease	(6) LAMIVUDINE absincrease ptr	(7) LAMIVUDINE absincrease mrp
dcontrol	-0.00776*** (0.00139)	-0.00849*** (0.00184)	-1,149*** (206.9)	0.0844*** (0.0107)	0.0835*** (0.0107)	3.36e-05 (2.10e-05)	-0.00336*** (0.000538)
p2xcontrol	-0.00807*** (0.00182)	-0.00977*** (0.00224)	-227.7** (87.67)	-0.108*** (0.0116)	-0.103*** (0.0124)	-0.000223*** (4.38e-05)	0.00510*** (0.00109)
p3xcontrol	-0.0124*** (0.00175)	-0.0199*** (0.00259)	-191.6 (147.2)	-0.106*** (0.0124)	-0.104*** (0.0122)	-4.33e-05 (4.74e-05)	
Constant	0.0579*** (0.00111)	0.0731*** (0.00142)	1,245*** (237.6)	-0.0664*** (0.00987)	-0.0404*** (0.00801)	0.000131*** (3.09e-05)	0.00385*** (0.000313)
Observations	6,575	6,575	6,575	6,575	6,575	6,575	347
R-squared	0.988	0.988	0.515	0.288	0.506	0.202	0.916

VARIABLES	(1) LITHIUM ptr	(2) LITHIUM mrp	(3) LITHIUM salesunits	(4) LITHIUM ptrincrease	(5) LITHIUM mrpincrease	(6) LITHIUM absincrease ptr	(7) LITHIUM absincrease mrp
dcontrol	0.000237*** (5.56e-05)	0.000289*** (8.49e-05)	-1,687*** (307.8)	-0.00426 (0.00654)	-0.0429*** (0.00521)	-7.70e-06*** (2.50e-06)	-0.000121*** (5.39e-05)
p2xcontrol	6.36e-05** (2.90e-05)	6.70e-05* (3.46e-05)	-95.96 (79.40)	0.0151*** (0.00558)	0.0323*** (0.00761)	1.21e-05*** (2.12e-06)	0.000144*** (5.38e-05)
p3xcontrol	4.61e-05 (5.12e-05)	0.000241*** (5.77e-05)	-405.5*** (126.3)	0.0136* (0.00732)	0.0196*** (0.00555)	-1.47e-06 (4.35e-06)	0.000124 (7.66e-05)
dslow	0.000525*** (7.18e-05)	0.000723*** (0.000104)	-1,109*** (369.2)	0.00722 (0.00613)	-0.0313*** (0.00560)	-3.74e-06 (2.94e-06)	-0.000279*** (5.74e-05)
Constant	0.00419*** (5.75e-05)	0.00533*** (8.29e-05)	1,928*** (321.5)	0.0140*** (0.00505)	0.0472*** (0.00593)	1.17e-05*** (2.23e-06)	0.000844*** (9.13e-05)
Observations	22,338	22,338	22,338	22,338	22,338	22,338	1,417
R-squared	0.831	0.837	0.675	0.081	0.138	0.072	0.545

VARIABLES	(1) METFORMIN ptr	(2) METFORMIN mrp	(3) METFORMIN salesunits	(4) METFORMIN ptrincrease	(5) METFORMIN mrpincrease	(6) METFORMIN absincrease ptr	(7) METFORMIN absincrease mrp
dcontrol	0.000483	0.000605	3,337***	-0.00243	0.00927	-4.29e-07	8.53e-05
	(0)	(0)	(409.5)	(0)	(0)	(0)	(0)
p2xcontrol	8.07e-05	0.000107	781.4***	0.00312	-0.00694	9.01e-06	-0.000139
	(0)	(0)	(176.6)	(0)	(0)	(0)	(0)
p3xcontrol	0.000121	0.000191	2,245***	0.00404	-0.0101	1.98e-06	6.59e-05
	(0)	(0)	(446.3)	(0)	(0)	(0)	(0)
dslow	0.000725	0.000904	335.1	0.0204	0.0175	7.24e-06	4.42e-05
	(0)	(0)	(601.4)	(0)	(0)	(0)	(0)
Constant	0.00203	0.00256	295.7	0.0517	0.0827	3.96e-06	0.000120
	(0)	(0)	(388.4)	(0)	(0)	(0)	(0)
Observations	165,696	165,696	165,696	164,404	164,404	164,404	12,134
R-squared	0.713	0.715	0.464	0.034	0.118	0.033	0.529

VARIABLES	(1) METHOTREXATE ptr	(2) METHOTREXATE mrp	(3) METHOTREXATE salesunits	(4) METHOTREXATE ptrincrease	(5) METHOTREXATE mrpincrease	(6) METHOTREXATE absincrease ptr	(7) METHOTREXATE absincrease mrp
dcontrol	-0.773	-0.961***	101.8	-0.0282***	-0.0285***	-0.00104	-0.0210
	(0)	(0.182)	(71.01)	(0.00501)	(0.00730)	(0.000703)	(0)
p2xcontrol	0.802	0.994***	97.84**	0.0275***	0.0339***	-0.000211	0.0251
	(0)	(0.275)	(46.28)	(0.00664)	(0.00837)	(0.00142)	(0)
p3xcontrol	0.714	0.909***	60.00	0.0407***	0.0508***	-0.000119	-0.00389
	(0)	(0.234)	(71.99)	(0.00596)	(0.00821)	(0.000749)	(0)
Constant	1.539	1.917***	79.46**	0.0107***	-0.0284***	0.000849***	0.544
	(0)	(0.0365)	(40.14)	(0.00317)	(0.00278)	(0.000257)	(0)
Observations	36,677	36,677	36,677	36,677	36,677	36,677	2,699
R-squared	0.248	0.246	0.522	0.101	0.171	0.080	0.570

VARIABLES	(1) METOPROLOL ptr	(2) METOPROLOL mrp	(3) METOPROLOL salesunits	(4) METOPROLOL ptrincrease	(5) METOPROLOL mrpincrease	(6) METOPROLOL absincrease ptr	(7) METOPROLOL absincrease mrp
dcontrol	0.00447*** (0.00133)	0.00539*** (0.00166)	2,797*** (217.1)	-0.0197*** (0.00203)	0.0127*** (0.00273)	-5.19e-05*** (1.94e-05)	0.000185 (0.000376)
p2xcontrol	0.00292*** (0.000805)	0.00355*** (0.00100)	467.7*** (80.78)	0.0265*** (0.00275)	-0.0113*** (0.00324)	-0.000298*** (7.68e-05)	-0.00287*** (0.000681)
p3xcontrol	0.00376*** (0.00113)	0.00522*** (0.00144)	477.2*** (132.1)	0.0178*** (0.00236)	-0.00643** (0.00317)	-6.02e-05 (5.21e-05)	0.00354*** (0.000913)
dslow	0.0610*** (0.00403)	0.0785*** (0.00507)	-863.8*** (284.9)	0.0163*** (0.00357)	0.0117*** (0.00341)	0.000873*** (0.000118)	0.0125*** (0.00117)
Constant	0.0317*** (0.00466)	0.0398*** (0.00588)	-2,086*** (266.5)	-0.0101** (0.00408)	-0.0180*** (0.00399)	-0.000634*** (9.04e-05)	-0.0447*** (0.00961)
Observations	177,321	177,321	177,321	172,311	172,311	172,311	14,941
R-squared	0.470	0.468	0.440	0.044	0.153	0.019	0.190

VARIABLES	(1) OFLOXACIN ptr	(2) OFLOXACIN mrp	(3) OFLOXACIN salesunits	(4) OFLOXACIN ptrincrease	(5) OFLOXACIN mrpincrease	(6) OFLOXACIN absincrease ptr	(7) OFLOXACIN absincrease mrp
dcontrol	0.00179*** (0.000168)	0.00220*** (0.000213)	2,689*** (314.3)	0.0124*** (0.00226)	0.000569 (0.00209)	-6.15e-06 (1.31e-05)	-2.74e-05 (0.000231)
p2xcontrol	0.000143 (0.000132)	0.000261 (0.000164)	204.1 (130.1)	0.00169 (0.00300)	0.0131*** (0.00351)	3.37e-05** (1.39e-05)	0.000982** (0.000395)
p3xcontrol	-0.000508** (0.000253)	0.000471 (0.000313)	326.6 (203.5)	-0.0158*** (0.00320)	-6.20e-05 (0.00309)	-4.20e-05** (1.76e-05)	-1.51e-05 (0.000367)
dslow	0.00266*** (0.000269)	0.00308*** (0.000290)	-2,536*** (571.9)	0.00377 (0.00386)	0.00357 (0.00512)	2.16e-05** (8.72e-06)	3.73e-05 (0.000211)
Constant	0.0148*** (0.000126)	0.0186*** (0.000159)	-1,032*** (253.2)	0.0168*** (0.00119)	0.0422*** (0.00108)	2.81e-05*** (4.96e-06)	0.000541*** (0.000169)
Observations	172,138	172,138	172,138	170,183	170,183	170,183	12,840
R-squared	0.879	0.873	0.326	0.043	0.117	0.022	0.150

VARIABLES	(1) OLANZAPINE ptr	(2) OLANZAPINE mrp	(3) OLANZAPINE salesunits	(4) OLANZAPINE ptrincrease	(5) OLANZAPINE mrpincrease	(6) OLANZAPINE absincrease ptr	(7) OLANZAPINE absincrease mrp
dcontrol	-0.0256	-0.0306	590.3	-0.00125	0.0127***	2.82e-05	-0.00394***
	(0)	(0)	(0)	(0.00187)	(0.00216)	(6.20e-05)	(0.000771)
p2xcontrol	0.000596	0.000632	74.04	0.00722**	-0.00534*	-0.000125	-0.00355***
	(0)	(0)	(0)	(0.00302)	(0.00300)	(0.000122)	(0.00107)
p3xcontrol	-0.00241	-0.00311	67.83	0.00623**	0.00916***	-6.97e-05	-0.00658***
	(0)	(0)	(0)	(0.00265)	(0.00289)	(0.000109)	(0.00127)
dslow	-0.0907	-0.107	-1,043	-0.0696***	-0.0653***	-0.00274***	-0.0264***
	(0)	(0)	(0)	(0.0116)	(0.0133)	(0.000391)	(0.000868)
Constant	0.444	0.556	-529.2	-0.0179***	-0.0252***	9.08e-05	0.0463***
	(0)	(0)	(0)	(0.00316)	(0.00347)	(9.89e-05)	(0.00285)
Observations	151,071	151,071	151,071	138,817	138,817	138,817	11,956
R-squared	0.389	0.422	0.334	0.038	0.115	0.037	0.462

VARIABLES	(1) PHENYTOIN ptr	(2) PHENYTOIN mrp	(3) PHENYTOIN salesunits	(4) PHENYTOIN ptrincrease	(5) PHENYTOIN mrpincrease	(6) PHENYTOIN absincrease ptr	(7) PHENYTOIN absincrease mrp
dcontrol	0.00867	0.0106	1,699	-0.0222	-0.0360	7.84e-06	-0.000176
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
p2xcontrol	-0.00897	-0.0115	518.2	0.00855	0.0255	4.06e-05	-1.35e-05
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
p3xcontrol	-0.00585	-0.00629	-21.68	-0.00199	-0.00372	-6.35e-06	0.00227
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
dslow	0.000369	0.000309	243.0	-0.0408	-0.0500	-6.10e-05	0.000120
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Constant	0.0113	0.0141	7,893	0.146	0.209	4.81e-05	-0.000413
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Observations	36,335	36,335	36,335	34,802	34,802	34,802	3,556
R-squared	0.308	0.296	0.370	0.081	0.147	0.038	0.170

VARIABLES	(1) PROPRANOLOL ptr	(2) PROPRANOLOL mrp	(3) PROPRANOLOL salesunits	(4) PROPRANOLOL ptrincrease	(5) PROPRANOLOL mrpincrease	(6) PROPRANOLOL absincrease ptr	(7) PROPRANOLOL absincrease mrp
dcontrol	0.00948***	0.0120***	2,806***	0.00491	0.000989	1.76e-05	0.00106***
	(0.000592)	(0.000746)	(483.0)	(0.00326)	(0.00366)	(2.02e-05)	(0.000266)
p2xcontrol	-0.00106*	-0.00139*	496.3**	-0.000713	0.0180***	0.000107**	0.000514
	(0.000596)	(0.000757)	(193.1)	(0.00462)	(0.00492)	(4.77e-05)	(0.000552)
p3xcontrol	0.00105	0.00466***	468.5	0.0124***	0.0186***	8.48e-05***	0.00189***
	(0.000779)	(0.00125)	(431.1)	(0.00357)	(0.00408)	(2.53e-05)	(0.000393)
dslow	-0.0252***	-0.0319***	1,368***	0.00527***	0.0150***	-0.000108***	-0.00374***
	(0.000930)	(0.00124)	(323.6)	(0.00158)	(0.00195)	(1.37e-05)	(0.000277)
Constant	0.0789***	0.0992***	-2,096***	0.0537***	0.0759***	0.000299***	0.00679***
	(0.000955)	(0.00129)	(409.9)	(0.00206)	(0.00241)	(1.66e-05)	(0.000337)
Observations	56,076	56,076	56,076	52,742	52,742	52,742	4,333
R-squared	0.318	0.326	0.655	0.064	0.148	0.070	0.534

VARIABLES	(1) PYRIDOSTIGMINE ptr	(2) PYRIDOSTIGMINE mrp	(3) PYRIDOSTIGMINE salesunits	(4) PYRIDOSTIGMINE ptrincrease	(5) PYRIDOSTIGMINE mrpincrease	(6) PYRIDOSTIGMINE absincrease ptr	(7) PYRIDOSTIGMINE absincrease mrp
dcontrol	0.0363***	0.0454***	543.1***	0.0152***	0.00971	0.000336***	-0.00216
	(0.000928)	(0.00119)	(203.4)	(0.00544)	(0.00705)	(4.30e-05)	(0)
p2xcontrol	-0.00468***	-0.00539***	165.5	-0.0522***	0.0117	-0.000386***	0.0113
	(0.00166)	(0.00209)	(119.3)	(0.00633)	(0.00824)	(9.90e-05)	(0)
p3xcontrol	-0.00462***	-0.00551***	482.1**	-0.00915	-0.000173	-0.000136**	0.00607
	(0.00160)	(0.00208)	(188.0)	(0.00704)	(0.00675)	(5.72e-05)	(0)
Constant	0.0914***	0.115***	12.54	0.136***	0.147***	0.000456***	0.00531
	(5.86e-05)	(7.98e-05)	(105.8)	(0.00130)	(0.00179)	(7.41e-06)	(0)
Observations	6,130	6,130	6,130	6,130	6,130	6,130	620
R-squared	0.872	0.872	0.506	0.289	0.328	0.121	0.618

VARIABLES	(1) RIFAMPICIN ptr	(2) RIFAMPICIN mrp	(3) RIFAMPICIN salesunits	(4) RIFAMPICIN ptrincrease	(5) RIFAMPICIN mrpincrease	(6) RIFAMPICIN absincrease ptr	(7) RIFAMPICIN absincrease mrp
dcontrol	0.000733*** (0.000260)	0.00102*** (0.000313)	-1,769*** (307.0)	0.0290*** (0.00377)	0.0196*** (0.00321)	-5.78e-05** (2.55e-05)	-0.000312 (0.000238)
p2xcontrol	0.00140*** (0.000369)	0.00128*** (0.000436)	-529.0** (246.6)	-0.0566*** (0.00753)	-0.0714*** (0.00885)	0.000197*** (6.99e-05)	0.00376*** (0.000769)
p3xcontrol	0.00144*** (0.000418)	0.00178*** (0.000509)	-1,022*** (371.9)	0.0178*** (0.00644)	-0.0223*** (0.00503)	6.12e-05** (2.72e-05)	0.000607*** (0.000228)
Constant	0.00965*** (7.32e-05)	0.0115*** (8.96e-05)	527.9*** (154.1)	0.0188*** (0.00492)	0.0372*** (0.00802)	8.81e-06*** (3.23e-06)	0.000770*** (0.000250)
Observations	13,362	13,362	13,362	13,361	13,361	13,361	893
R-squared	0.937	0.937	0.542	0.121	0.223	0.059	0.974

VARIABLES	(1) SALBUTAMOL ptr	(2) SALBUTAMOL mrp	(3) SALBUTAMOL salesunits	(4) SALBUTAMOL ptrincrease	(5) SALBUTAMOL mrpincrease	(6) SALBUTAMOL absincrease ptr	(7) SALBUTAMOL absincrease mrp
dcontrol	0.0436 (0)	0.0518 (0)	16,577 (0)	0.00233 (0.00943)	0.00376 (0)	-1.31e-05 (0)	0.00581 (0)
p2xcontrol	0.00551 (0)	0.00532 (0)	3,669 (0)	-0.0456*** (0.00816)	0.0287 (0)	0.000169 (0)	
p3xcontrol	0.0109 (0)	0.0224 (0)	-10,072 (0)	0.0201** (0.00878)	0.00968 (0)	0.00199 (0)	
dslow	-0.000523 (0)	-0.0127 (0)	4,951 (0)	0.0260** (0.0121)	-0.00126 (0)	0.000100 (0)	
Constant	-0.0175 (0)	-0.0182 (0)	-20,018 (0)	0.0465*** (0.00973)	0.00883 (0)	9.85e-05 (0)	0.0435 (0)
Observations	21,551	21,551	21,657	18,245	18,245	18,245	492
R-squared	0.835	0.806	0.417	0.090	0.101	0.088	1.000

VARIABLES	(1) SODIUMVALPROATE ptr	(2) SODIUMVALPROATE mrp	(3) SODIUMVALPROATE salesunits	(4) SODIUMVALPROATE ptrincrease	(5) SODIUMVALPROATE mrpincrease	(6) SODIUMVALPROATE absincrease ptr	(7) SODIUMVALPROATE absincrease mrp
dcontrol	-0.000141	-0.000131	-57.47	-0.00376	0.00227	-8.54e-06	-0.000109
	(0.000103)	(0.000124)	(94.32)	(0.00341)	(0.00368)	(5.21e-06)	(0)
p2xcontrol	9.94e-05	0.000162**	195.8**	0.0164***	-0.0419***	4.89e-05***	0.000806
	(6.57e-05)	(8.19e-05)	(95.70)	(0.00529)	(0.00628)	(1.34e-05)	(0)
p3xcontrol	0.000747***	0.00110***	-22.04	-0.0218***	-0.0145***	-6.94e-06	0.00169
	(0.000117)	(0.000163)	(130.2)	(0.00402)	(0.00396)	(6.00e-06)	(0)
dslow	-0.00170***	-0.00220***	-630.5***	-0.120***	-0.147***	-8.68e-05***	-0.00230
	(2.55e-05)	(3.05e-05)	(25.97)	(0.000535)	(0.000732)	(4.89e-07)	(0)
Constant	0.0136***	0.0172***	1,358***	0.168***	0.192***	8.52e-05***	0.000167
	(7.41e-05)	(8.53e-05)	(74.22)	(0.00167)	(0.00201)	(1.25e-06)	(0)
Observations	41,205	41,205	41,205	41,136	41,136	41,136	3,338
R-squared	0.812	0.659	0.451	0.081	0.176	0.042	0.251

VARIABLES	(1) SPIRONOLACTONE ptr	(2) SPIRONOLACTONE mrp	(3) SPIRONOLACTONE salesunits	(4) SPIRONOLACTONE ptrincrease	(5) SPIRONOLACTONE mrpincrease	(6) SPIRONOLACTONE absincrease ptr	(7) SPIRONOLACTONE absincrease mrp
dcontrol	-0.000360	-0.00289***	11,840***	0.0174***	0.0352***	0.000612***	-0.00200***
	(0.000370)	(0.000348)	(2,460)	(0.00624)	(0.00461)	(8.66e-06)	(0)
p2xcontrol	0.00357***	0.00748***	1,470	-0.107***	-0.0770***	-0.000758***	0.00500***
	(0.000609)	(0.000594)	(1,126)	(0.00408)	(0.0130)	(1.52e-05)	(0)
p3xcontrol	0.00583***	0.00692***	-2,667**	-0.0583***	-0.0653***	-0.000634***	
	(0.000486)	(0.000525)	(1,116)	(0.00591)	(0.00368)	(1.32e-05)	
Constant	0.0142***	0.0182***	2,025***	-0.00188	0.00773	8.09e-05***	0.00751***
	(0.000332)	(0.000422)	(361.4)	(0.0140)	(0.0142)	(2.13e-05)	(0)
Observations	8,097	8,097	8,097	8,097	8,097	8,097	520
R-squared	0.695	0.689	0.549	0.277	0.235	0.246	1.000

VARIABLES	(1) TAMOXIFEN ptr	(2) TAMOXIFEN mrp	(3) TAMOXIFEN salesunits	(4) TAMOXIFEN ptrincrease	(5) TAMOXIFEN mrpincrease	(6) TAMOXIFEN absincrease ptr	(7) TAMOXIFEN absincrease mrp
dcontrol	-0.338	-0.433	2,214	-0.0798	-0.124	-0.000765	
	(0)	(0)	(0)	(0)	(0)	(0)	
Constant	0.570	0.735	-244.7	0.0438	0.0652	0.000681	0.158***
	(0)	(0)	(0)	(0)	(0)	(0)	(0.0159)
Observations	10,278	10,278	10,278	10,278	10,278	10,278	680
R-squared	0.987	0.954	0.410	0.113	0.184	0.035	0.535

VARIABLES	(1) TERBUTALINE ptr	(2) TERBUTALINE mrp	(3) TERBUTALINE salesunits	(4) TERBUTALINE ptrincrease	(5) TERBUTALINE mrpincrease	(6) TERBUTALINE absincrease ptr	(7) TERBUTALINE absincrease mrp
dcontrol	0.0323***	0.0404***	1,633***	0.0117***	0.00569	-3.02e-05	0.00317***
	(0.000814)	(0.00131)	(402.3)	(0.00373)	(0.00394)	(5.03e-05)	(0.000801)
p2xcontrol	-0.00379	-0.00893**	393.9	-0.0265***	0.0276**	0.000240	-0.00744
	(0.00232)	(0.00375)	(261.6)	(0.00621)	(0.0130)	(0.000238)	(0.00459)
p3xcontrol	-0.0140**	-0.0159**	-480.7**	-0.0299***	0.0196	-0.000776***	-0.00184**
	(0.00584)	(0.00714)	(204.3)	(0.00415)	(0.0151)	(0.000243)	(0.000817)
Constant	0.251***	0.316***	1,770***	0.0812***	0.102***	0.00105***	0.0198***
	(0.000508)	(0.000680)	(108.0)	(0.000613)	(0.000818)	(4.26e-05)	(0.000714)
Observations	7,654	7,654	7,654	7,145	7,145	7,145	670
R-squared	0.988	0.985	0.307	0.233	0.294	0.070	0.656

VARIABLES	(1) VERAPAMIL ptr	(2) VERAPAMIL mrp	(3) VERAPAMIL salesunits	(4) VERAPAMIL ptrincrease	(5) VERAPAMIL mrpincrease	(6) VERAPAMIL absincrease ptr	(7) VERAPAMIL absincrease mrp
dcontrol	0.000233***	0.00101***	15,500***	-0.0306***	-0.0219***	-5.94e-05***	
	(1.60e-05)	(1.74e-05)	(2,162)	(0.00179)	(0.00447)	(3.21e-06)	
p2xcontrol	-0.000620***	-0.000833***	394.8	0.0373***	-0.00159	2.23e-05***	
	(4.35e-06)	(5.70e-06)	(831.5)	(0.00212)	(0.00240)	(2.45e-06)	
p3xcontrol	-0.000932***	-0.000931***	1,168	0.0285***	0.0429***	4.12e-05***	
	(5.95e-06)	(7.24e-06)	(752.2)	(0.00141)	(0.00330)	(2.51e-06)	
dslow	-8.34e-05***	-8.13e-05***	2,040***	-0.00549***	-0.0374***	-3.21e-05***	-0.000793***
	(1.72e-05)	(1.81e-05)	(348.0)	(0.00130)	(0.00294)	(1.98e-06)	(3.41e-05)
Constant	0.0137***	0.0170***	572.8	0.0261***	0.0652***	4.05e-05***	0.00162***
	(1.17e-05)	(1.22e-05)	(830.8)	(0.000947)	(0.00222)	(1.39e-06)	(7.58e-06)
Observations	9,494	9,494	9,494	9,494	9,494	9,494	436
R-squared	0.516	0.394	0.354	0.266	0.152	0.163	0.967

VARIABLES	(1) WARFARIN ptr	(2) WARFARIN mrp	(3) WARFARIN salesunits	(4) WARFARIN ptrincrease	(5) WARFARIN mrpincrease	(6) WARFARIN absincrease ptr	(7) WARFARIN absincrease mrp
dcontrol	-0.748***	-0.933***	4,149***	-0.0337***	-0.0448***	-0.00229***	-0.0400
	(0.0582)	(0.0732)	(846.4)	(0.00484)	(0.00643)	(0.000147)	(0)
p2xcontrol	0.0400*	0.0398	992.4***	0.0139***	-0.0253***	-0.00336***	-0.0400
	(0.0225)	(0.0285)	(315.2)	(0.00413)	(0.00630)	(0.000271)	(0)
p3xcontrol	-0.00488	-0.0282	1,045**	0.0660***	0.0784***	0.00289***	-0.0170
	(0.0262)	(0.0350)	(435.8)	(0.00592)	(0.00727)	(0.000497)	(0)
Constant	1.065***	1.339***	399.8	0.0672***	0.124***	0.00457***	0.0814
	(0.0172)	(0.0222)	(273.1)	(0.000871)	(0.00102)	(3.86e-05)	(0)
Observations	9,292	9,292	9,292	9,292	9,292	9,292	926
R-squared	0.490	0.501	0.618	0.291	0.395	0.267	0.549