Cost-shifting among rural Montana independent community pharmacies

Kyle A. Downey
The University of Montana

Follow this and additional works at: https://scholarworks.umt.edu/etd
Let us know how access to this document benefits you.

Recommended Citation

This Thesis is brought to you for free and open access by the Graduate School at ScholarWorks at University of Montana. It has been accepted for inclusion in Graduate Student Theses, Dissertations, & Professional Papers by an authorized administrator of ScholarWorks at University of Montana. For more information, please contact scholarworks@mso.umt.edu.
The University of MONTANA

Permission is granted by the author to reproduce this material in its entirety, provided that this material is used for scholarly purposes and is properly cited in published works and reports.

** Please check "Yes" or "No" and provide signature **

Yes, I grant permission  
No, I do not grant permission

Author's Signature  Kyle A Downey

Date  12-16-98

Any copying for commercial purposes or financial gain may be undertaken only with the author's explicit consent.
COST-SHIFTING AMONG RURAL MONTANA INDEPENDENT COMMUNITY PHARMACIES

By

KYLE A. DOWNEY

BA Economics, The University of Washington, 1993

Presented in partial fulfillment of the requirements of Master of Science

The University of Montana
1999

July 27, 1999

Approved by:

Chairperson

Dean, Graduate School

7-29-99
ABSTRACT

Downey, Kyle A., MS Pharmacy Administration, June 1999

Cost-Shifting Among Rural Montana Independent Community Pharmacies (65 pp.)

Director: Timothy P. Stratton, Ph.D., R.Ph.

Cost-shifting is a familiar term within the health care community and is commonly associated with hospitals. Many other health care providers, including pharmacists, have been affected by the practice. With the number of patients covered by third-party programs continuing to increase, cost-shifting is one of pharmacy's many complex issues.

The goal of the study was to determine if Montana Independent Retail Pharmacies engage in third-party induced cost-shifting. Costs of dispensing prescriptions by study pharmacies and drug costs were compared to the reimbursement rates for three different groups of prescription patients: cash customers, Montana Medicaid customers and Express Scripts customers (a third-party carrier for University of Montana employees).

Data were collected from six Independent pharmacies throughout Montana. Information was collected on 100 consecutive private pay prescriptions for each of the stores. Using pricing formulas supplied by the pharmacy managers, gross reimbursements were calculated for each of the same prescriptions as if they had been dispensed to Montana Medicaid or Express Scripts patients. A breakeven all-payer price was determined for each prescription consisting of the acquisition cost of each drug and the cost of dispensing the prescription. Cost-shifting occurs if a significant difference exists between the mean price for each group of prescriptions and if one or more payer group(s) are reimbursing below the all-payer price.

All study pharmacies were located in rural areas with populations less than 25,000. A total of 596 prescriptions were analyzed. The average cost of dispensing a prescription among study pharmacies was determined to be $6.12 (+/- $0.85SD). Third-party prices were calculated using formulas based on Average Wholesale Price (AWP), utilizing Maximum Acquisition Cost (MAC) for certain generic drugs. Combining prescriptions from the six stores (n=596), $0.90 per prescription was found to be shifted from Express Scripts (one of many third-party programs) to cash paying customers for the same prescription. Five cents of the charge for each cash prescription may be directly attributed to the Express Scripts program.

As the number of patients being covered by third-party payers increases, the ability to cost-shift to cash paying patients will diminish. By accepting contracts below the cost of dispensing a prescription, independent pharmacies risk losing money by serving patients whose prescriptions are covered by third-party payers. To soften the burden, on average, the independent pharmacies in this study cost-shift to their private pay patients.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF TABLES AND FIGURES</td>
<td>v</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>vi</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Cost-Shifting</td>
<td>1</td>
</tr>
<tr>
<td>Price Discrimination</td>
<td>2</td>
</tr>
<tr>
<td>Pharmacy Market</td>
<td>2</td>
</tr>
<tr>
<td>Third Degree Price Discrimination</td>
<td>3</td>
</tr>
<tr>
<td>Price Discrimination vs. Cost-Shifting</td>
<td>4</td>
</tr>
<tr>
<td>Cost-Shifting by Hospitals</td>
<td>8</td>
</tr>
<tr>
<td>Research Question</td>
<td>12</td>
</tr>
<tr>
<td>REVIEW OF THE LITERATURE</td>
<td>13</td>
</tr>
<tr>
<td>Cost-Shifting in the Hospital Industry</td>
<td>13</td>
</tr>
<tr>
<td>Cost-Shifting among Private Practice Physicians</td>
<td>17</td>
</tr>
<tr>
<td>Cost-Shifting among Retail Pharmacy</td>
<td>18</td>
</tr>
<tr>
<td>Hypothesis</td>
<td>20</td>
</tr>
<tr>
<td>METHODOLOGY</td>
<td>22</td>
</tr>
<tr>
<td>Pharmacy Selection and Activities</td>
<td>22</td>
</tr>
<tr>
<td>Net Contributions Calculations</td>
<td>24</td>
</tr>
<tr>
<td>Cost-Shift Calculations</td>
<td>24</td>
</tr>
<tr>
<td>ASSUMPTIONS AND LIMITATIONS</td>
<td>29</td>
</tr>
<tr>
<td>RESULTS</td>
<td>31</td>
</tr>
<tr>
<td>Pharmacy Characteristics</td>
<td>31</td>
</tr>
<tr>
<td>Pharmacy Reimbursement</td>
<td>31</td>
</tr>
<tr>
<td>Market</td>
<td>33</td>
</tr>
<tr>
<td>Cost of Dispensing a Prescription</td>
<td>34</td>
</tr>
<tr>
<td>Net Reimbursement</td>
<td>36</td>
</tr>
<tr>
<td>Pharmacy Cost-Shift</td>
<td>37</td>
</tr>
<tr>
<td>Regression Analysis</td>
<td>38</td>
</tr>
<tr>
<td>Correlation</td>
<td>40</td>
</tr>
<tr>
<td>Mean Weighted Revenue</td>
<td>40</td>
</tr>
</tbody>
</table>
LIST OF TABLES AND FIGURES

FIGURES

FIGURE 1: THIRD-DEGREE PRICE DISCRIMINATION ........................................... 4

FIGURE 2: COST-SHIFTING
   A) PROFIT MAXIMIZING HOSPITAL ............................................ 6
   B) COST MINIMIZATION HOSPITAL ........................................... 6

FIGURE 3: COST-SHIFTING BELOW MONOPOLY PRICE ............................... 8

FIGURE 4: CHANGES IN HOSPITAL MEDICARE RATES ............................... 9

FIGURE 5: PHYSICIAN PROFIT MAXIMIZATION ......................................... 18

TABLES

TABLE 1: AVERAGE REIMBURSEMENT RATES FOR EACH PHARMACY ............... 32

TABLE 2: PERCENTAGE OF THIRD-PARTY PRESCRIPTIONS FILLED BY STUDY PHARMACIES AND NUMBER OF COMPETING PHARMACIES .......... 34

TABLE 3: COST OF DISPENSING A PRESCRIPTION FOR STUDY PHARMACIES ............................. 34

TABLE 4: DIFFERENCES IN NET REIMBURSEMENT .................................. 37

TABLE 5: INDEPENDENT PHARMACY COST-SHIFT ................................... 38

TABLE 6: REGRESSION ANALYSIS ...................................................... 38

TABLE 7: MEAN WEIGHTED REVENUE (ALL STORES) ............................... 42

TABLE 8: MEAN WEIGHTED REVENUE (STORES 1, 2, 4 & 5) .................... 43

TABLE 9: REDUCTION IN TOTAL REVENUE PER PRESCRIPTION .................. 44
ACKNOWLEDGEMENTS

I would like to thank the American Foundation for Pharmaceutical Education (AFPE) and NARD for the funding received for this project.

In addition, I appreciate the help and guidance I have received from Professor Timothy Stratton, Professor Lori Morin and Professor Kay Unger on the project.

Most of all, I would like to thank my parents, Pat and Karen, for all of the support and guidance they have provided throughout my many years of schooling.
INTRODUCTION

Are third party prescription programs unjust? While the beneficiaries of many third party programs are relatively affluent, many private pay patients are less financially secure. This latter group includes the elderly on fixed incomes, the self-employed, the underinsured and the uninsured. Prescription reimbursement policies of third party payers cause increased costs from dispensing third party prescriptions (Huey et al., 1995). If these reimbursement policies cause pharmacies to charge more to private pay patients, then cost-shifting is occurring. In the present study, whether cost-shifting is occurring and the extent to which the costs are redistributed to private pay patients in a sample of rural Montana independent pharmacies was examined.

Cost-Shifting

Cost-shifting is a familiar term within the health care community. The practice has been used and associated with hospitals for many years (Ginsburg et al., 1984; Johnson et al., 1984; Duncan, 1992). Many other health care providers, including pharmacists, have also been affected by the practice (Rice et al., 1996; McMillan et al., 1990). In pharmacy, the prevalence of cost-shifting has increased over the past several years and is predicted to continue to do so (McMillan et al., 1990). With an increasing proportion of prescriptions paid for by third parties, cost-shifting is one of the most important and controversial issues pharmacy will have to face in the immediate future.

As defined in the hospital industry, cost-shifting is "the practice by a hospital of charging more to one group of patients because another group is not paying its share of the costs of hospital care (Johnson et al., 1984)." This definition of cost-shifting can be applied to any business which charges consumers different prices for the same service.
where the discount given results in reimbursements falling below the cost of providing that service. Thus, cost-shifting is a form of price discrimination (Cohodes, 1984).

**Price Discrimination**

Price discrimination occurs when a producer of a product charges different prices for an identical product. An example of price discrimination is the charging of different admission prices to the same movie. The higher price elasticity (sensitivity) of senior citizens and students makes it a good strategy to charge lower prices to these groups to attract more people into the theater (Frank, 1991). If more seats are being filled during each show, then the theater is adding to the revenue taken in for a particular movie.

Three conditions must apply for a producer of goods and services to engage in price discrimination (Carlton et al., 1990). First, the producer must have some market power, otherwise he/she will not be able to charge more than the competitive price. Second, the producer must be able to predict the consumer's willingness to pay and that willingness to pay must vary across consumers. Third, the producer must be able to prevent or limit the resale of products from customers who pay the lower price to those who pay the higher price. All three of these conditions are met in the health care sector. When producers of goods set high prices for a service and simultaneously offer discounts to certain customers, such as patients on government programs or those with insurance, price discrimination occurs.

**Pharmacy Market**

Pharmacies engage in price discrimination by fulfilling the three conditions. In the case of the retail pharmacy, most pharmacies have some degree of market power. The loyalty of patients who frequent the pharmacy is an excellent example. In addition, the
number of pharmacists in a community as well as the high overhead of opening a pharmacy often limit the number of pharmacies in a specific area. All of these conditions lead to pharmacies having some degree of market power.

Second, pharmacies are rather easily able to predict patients’ willingness to pay. The patient market is split for the pharmacy into those patients who pay directly for their prescriptions, those who participate in third-party programs and those who participate in the Medicaid program.

Finally, resale of prescription products from the lower price group to those who pay the higher price is prevented through many avenues. First of all, federal law prohibits the use of prescription products by persons for whom they are not prescribed. The sheer numbers of products which physicians prescribe make resale difficult and patients trust that products are not adulterated through the pharmacy, which may not be the case through resale. Trust and confidence that the products are safe and effective is probably the primary reason more resale does not occur.

**Third-Degree Price Discrimination**

A firm without enough information to identify what each customer is willing to pay is unable to extract all of the customer surplus. However, if a firm can determine whether a customer falls into a particular group and it knows the different aggregate demand curves for each group (demand elasticity), different prices may be charged to each group. This is known as third-degree price discrimination (Carlton et al., 1990). Different consumers face different per-unit prices. An example follows where high transaction costs may prevent resale and enable a firm to charge consumers in California higher prices than those in New York.
Imagine a product sold both in California and New York (Figure 1). Letting the subscripts 1 and 2 stand for customer groups in California and New York, respectively, P for price, Q for quantity demanded and MC for marginal cost, the monopolist looks to maximize profits by the following equation:

$$(P_1 - MC) Q_1 + (P_2 - MC) Q_2 = \text{Profits}.$$  

By charging a higher price in California compared to that of New York, the monopolist will separately maximize profits from groups 1 and 2. This is graphically illustrated in Figure 1.

**FIGURE 1: Third-Degree Price Discrimination**

---

**Price Discrimination vs. Cost-Shifting**

Every seller would like to practice perfect price discrimination and maximize the revenue the firm receives. However, if it costs more to serve a particular group of
customers, it is misleading to interpret all price differences as price discrimination (Carlton et al., 1990). If a business is losing money on one group of customers, it may be able to increase prices to another group to recoup the losses; this practice would be cost-shifting.

Price discrimination and cost-shifting both involve charging different prices to different payers for the same service, but the theories have different origins (Rosko et al., 1994). Price discrimination is developed from the neoclassical model of the profit-maximizing, surplus maximizing or cost-minimizing firm. It predicts that a profit-maximizing seller setting its price in the private market and facing a lower government-regulated price in another market, will react by not cost-shifting, or by even possibly lowering the private market price to shadow the government regulated price. In contrast, cost-shifting is viewed as a survival response. With price reductions from government or other payers, the firm will react by increasing private market prices. Thus, it is predictable that hospitals with different objectives (profit maximization vs. utility maximization) will behave differently (Hoerger, 1991).

Cost-shifting is therefore dependent on where the hospital’s prices start to determine whether it occurs. If a discount is being offered to one group of consumers below the costs of that firm and another group of consumers is off-setting that discount with increased prices as a surplus, then cost-shifting is present. This is graphically illustrated in Figure 2.
In the profit-maximizing hospital, if the price starts at $P_1$, then a decrease in group 2’s price from $P_1$ to $P_2$ (A to B) will not invoke the hospital to change the price of group 1. Thus revenue will be extracted from the hospital’s surplus profits (A to C) and cost-shifting does not occur. However, circumstances of the cost minimization hospital are
entirely different. If the price starts at $P_0$, just covering its costs of operation, and group 2's price is lowered from $P_0$ to $P_2$ (A to B), then the hospital is forced to increase the prices $P_0$ to $P_1$ (A to D) to group 1, creating cost-shifting. The amount of the surplus must at least be equal to the net liability. If the price to group 1 is not increased, then the hospital's costs will be greater than its revenue and it will be forced to close.

A third situation may arise where customers in group 1 are being charged a price $P_0$ above the cost of the product but below that of the monopoly price (Figure 3). Group 2's price is then reduced from $P_0$ to $P_2$ (A to B). Therefore, the lightly-shaded area represents the liability the hospital has for selling to the consumers in group 2. If the net liability is greater than the surplus, cost-shifting occurs to offset the liability, increasing group 1's price from $P_0$ to $P_1$ (A to D). The increased surplus generated by the customers in group 1 offsets the liability from the customers in group 2. Otherwise the hospital will be forced out of business when its costs exceed its revenue.
Cost-Shifting by Hospitals

Price discrimination is used to explain hospital cost-shifting (Folland et al., 1997). Two types of hospitals exist in the United States, profit and not-for-profit institutions. The majority of hospitals are not-for-profit (or non-profit). These institutions are looking to maximize other objectives, such as the "welfare" of the community or the labor force which they employ.

Assume that hospitals maximize profits, or for non-profit institutions, hospitals maximize some other objectives (utility). In addition, assume that two groups of patients exist, private (insured or self-pay) and Medicare. A downward sloping demand curve will be employed for the private sector and a constant rate for Medicare reimbursement (Figure 4). Private pay patients will economize or substitute services as their out-of-
pocket expenses increase, justifying the downward-sloping demand curve. So when a hospital raises its fees patients will search for alternative treatments, go to a different hospital or simply purchase less hospital care. Medicare reimbursement is received by the hospitals in two forms, that of fixed costs and variable costs. Fixed costs are received on a yearly basis based upon the hospital's size and do not vary with the quantity of patients treated. Variable costs are reimbursed based on diagnostic related groups (DRGs) for services provided for each patient. Here variable costs are used to assess cost-shifting.

FIGURE 4: Changes in Hospital Medicare Rates

Suppose that R1 covers the average variable cost (C1) for a certain number of Medicare patients seeking admission (Q2) as shown for the Medicare sector, but the rate does not necessarily cover all costs. Finally, the hospital is operating below capacity and C1 is constant over the relevant range and is also equal to the marginal cost. If the hospital
cannot price discriminate in the private sector, then it will accept $Q_1$ private sector patients (where marginal revenue equals marginal cost) and set the price at $P_1$. It will also accept all Medicare patients at a rate of $R_1$ so the hospital will treat a total of $Q_1 + Q_2$ patients. Therefore, total revenues of $P_1Q_1 + R_1Q_2$ create a surplus over variable cost of $(P_1-C_1)Q_1 + (R_1-C_1)Q_2$.

Assume the Medicare reimbursement rate is lowered to $R_2$ but that rate is still above the average variable and marginal cost. This will allow the hospital to still accept $Q_2$ Medicare patients. However, it will not be beneficial for the hospital to increase the price in the private sector. Hospital surpluses will diminish at prices above $P_1$ due to loss of private sector patients whose marginal revenue exceeds marginal cost (monopoly price). The optimal pricing rate remains at $P_1$ for $Q_1$ private patients and cost-shifting will not occur.

Cost-shifting may arise in the model if the hospital was not previously maximizing profits (this is, if the hospital were a cost-minimizing hospital), accepting patients whose marginal revenue fell short of marginal costs (Foland et al., 1997). Hospitals not maximizing profits (typically non-profit institutions) are those which are maximizing another utility, such as the “welfare” of the community. Accepting a lower Medicare rate would induce the hospital to reduce the number of private pay patients by raising the private sector price.

In either case the hospital’s revenues and surplus will be reduced. If the hospital is able to cost-shift, only part of the lost surplus will be recuperated. Over the long run, revenues must cover all costs, otherwise the hospital will not be able to survive. If after lowering the Medicare payment rate the hospital’s revenues still exceed its costs, then no
effect on the private sector price should be seen in the long run. However, that will not be the case if the hospital’s costs exceed its revenue in the long run. The hospital which cannot reduce its costs and cannot increase revenues by cost-shifting will either be forced out of business or forced to merge. As consolidation and closure occurs patients will have fewer hospitals from which to choose, shifting outward the demand for the remaining hospitals until private pay rates can cover the total long-run subsidy of Medicare patients.

Three important points should be taken from hospital cost-shifting. First, participation in the Medicare and Medicaid programs for hospitals is, for all intents and purposes, involuntary. Medicare provides coverage for such a large percentage of a hospital’s potential market, that hospitals must take these patients regardless of the reimbursement rate. If that rate falls below the hospital’s costs which the hospital has already minimized, then cost-shifting is engaged as a survival tactic.

Second, cost-shifting is dependent upon where the costs are set before the price reduction to a particular group is made. If the hospital is a monopolist or profit-maximizer, then cost-shifting does not occur and revenue is extracted from the hospital’s surplus. However, if the hospital is maximizing other objectives such as the “welfare” of the community and setting its prices below the monopoly price to begin with, then cost-shifting may be employed in the presence of decreasing Medicare or Medicaid reimbursement.

Finally, there is a limit to the price reductions to any specific group of patients. When the net liability of a group exceeds the maximum surplus of the other group, then the hospital can either reduce costs or go out of business. The former may lead to a decrease in the quality of services provided or the number of services available to patients.
Research Question

Pharmacy cost-shifting has not been assessed in Montana. With the increasing number of third-party programs entering the pharmacy market, cost-shifting is a worthwhile question to be addressed.

The preceding discussions of cost-shifting and third-degree price discrimination lead to the question to be asked of Independent Retail Pharmacies in this study: Are increased prices being charged to cash-paying patients in the presence of low reimbursement from third-party payers (creating cost-shifting), or are third-party reimbursement policies adequate to cover the pharmacies’ costs?

Hospital cost-shifting is used as the basic framework for the analysis of cost-shifting in pharmacy. The common thread which relates hospital and pharmacy cost-shifting is that both follow the same principles of price discrimination, as described above. However, the major difference between the two is that cost-shifting by hospitals is involuntary. Every hospital must serve Medicare and Medicaid patients. In contrast, pharmacies may choose not to participate in any third-party programs, if desired. Pharmacy cost-shifting is then voluntary due to the fact that pharmacies choose to participate in Medicaid and third-party programs and are not obligated to do so by law.
REVIEW OF THE LITERATURE

A manual literature search was conducted at The University of Montana using *International Pharmaceutical Abstracts* (IPA), and electronic searches were performed using *Medline, Business Index* and the *Academic Index*. “Cost-shifting” was used as the primary search term, with additional search terms being introduced as needed.

Few articles were produced in the field of pharmacy. However, a broad range of articles discussing cost-shifting in the hospital sector were identified. In this paper, a review of cost-shifting in the hospital sector will provide a framework for analyzing cost-shifting in Independent Retail Pharmacy. In addition, physician cost-shifting and past research on pharmacy cost-shifting will be reviewed.

**Cost-Shifting in the Hospital Industry**

In the hospital sector, cost-shifting has been analyzed in many forms since the early 1980s. Debates continue over whether the phenomenon actually occurs and if specific consumers are charged excessive prices to compensate for those who do not pay for the full cost of their care. Cost-shifting in hospitals was explored in depth in the early 1980s (Ginsburg & Stone, 1984; Johnson et al., 1984; Duncan, 1992). The realization that a tiered pricing structure granted large discounts to preferred customer bases along with the increasing costs of health care brought awareness to the issue. For the year 1981, cost-shifting in the hospital industry was estimated to be $4.8 billion, as estimated by the Health Insurance Association of America (Ginsburg & Stone, 1984). Low reimbursement rates from Medicare and Medicaid programs caused hospitals to charge some third-party and cash-paying patients more to cover the nonreimbursed costs of caring for Medicare and
Medicaid patients. Accelerating this cost-shifting phenomenon was the establishment of
the prospective-payment system for Medicare (Ginsburg & Stone, 1984).

Cost-shifting was analyzed in 26 community and public hospitals in the Twin-Cities
metropolitan area from 1981 to 1982 (Johnson et al, 1984). The average hospital had
10,804 admissions and provided 78,120 days of care. The cost-shift was based upon
discounts offered as a percentage of billed charges increasing from $40 million in 1981 to
$63 million in 1982 (1981 adjusted dollars). The shift was primarily due to Medicare and
Medicaid patients but was also associated with the presence of a large Health Maintenance
Organization in the area.

Duncan (1992) discusses the history of cost-shifting from the perspective of
uncompensated care. Uncompensated care is unevenly distributed among providers,
creating cost-shifting. The shifted costs are moved primarily to third-party payers but also
to that of Medicare and Medicaid payers.

Prior to the advent of managed care and capitation, insurers paid hospitals in one
of three ways (Ginsburg & Stone, 1984): pay the total amount charged by the hospital;
reimburse what they determined to be the hospital’s legitimate incurred costs (these
included insurance firms with market power), or specify in advance the amount they would
pay for a specific procedure. Insurers who reimburse on costs or a prospective payment
plan are responsible for most of the cost shifting for three primary reasons (Ginsburg &
Stone, 1984). All three activities lead the hospital to collect payments below the costs of
performing procedures, adding increasing pressure to shift costs.

The first reason is the limitation of cost-finding accounting systems which allocate
costs among different patient groups. These systems attempt to determine the proportion
of hospital costs attributable to each insurer, but the extensive resources required for
detailed reporting limits the accuracy of these data. The second reason prospective
payment systems induce cost-shifting is the unwillingness of insurers to pay for charitable
hospital activities. Care for uninsured patients accounts for a large share of payment
differentials. Hospitals provide charity care to those who are unable to pay their bills.
The final reason for cost-shifting is the prudent purchasing policies of insurers. Insurers
only pay costs which they consider “reasonable.” For example, Medicare and Medicaid
do not pay a return on equity to not-for-profit hospitals because some equity is donated.
As philanthropic and government grants have become scarce and costs are not covered by
Medicare and Medicaid, revenue differentials arise (Ginsburg & Stone, 1984).

There are differing opinions as to whether cost-shifting really occurs in the realm
of hospital industry (Morrisey, 1995; Cohodes 1984). Critics contend that cost-shifting
plays only a very minimal role in the hospital market. The real debate arises over whether
hospitals are being reimbursed above their costs for providing services to patients. If
hospital costs exceed the rates at which they are being reimbursed, they are forced into a
survival tactic of shifting costs to other patients.

In a review article, Morrisey (1995) analyzes the empirical evidence of cost-
shifting. Early studies showed cost-shifting as private prices increased by 50 cents for
each dollar decreased government spending (1981-83 data) and also by 90 cents (1979
data). However, a more recent study analyzing 1983 Blue Cross payments found that in
the presence of fixed pricing by Medicare, Blue Cross saved money. This was taken as
evidence that no cost-shifting was occurring.
Cohodes (1984) states that the extent of cost-shifting has been overestimated. His analysis proposes that the cost-shifting has been based upon charges and not the actual costs by the hospitals in the early 1980s. He does admit that cost-shifting exists but questions to where the costs are being shifted and the extent to which shifting actually occurs.

Government and private not-for-profit hospitals behave differently than for-profit hospitals (Hoerger, 1991). During periods of large changes in reimbursement policy (1983 to 1988), individual not-for-profit and government hospitals experienced significantly lower variations in profits than similarly-sized for-profit hospitals. For-profit hospitals operate near the peak of their profit function and therefore their profits reflect the full effects of fluctuations in reimbursement rates. Conversely, not-for-profit and government hospitals operating below their peak profit functions were able to cost-shift to maintain their profits. As discussed earlier, this behavior depends upon where the hospitals’ prices begin (refer to Figure 3). If a for-profit hospital is already charging the monopolist price then there is no incentive to cost-shift. Conversely, not-for-profit hospitals have an incentive to cost-shift to increase revenue in the presence of decreasing Medicare prices.

Cost-shifting may take the form of increases in prices to private patients, but adjustments may occur to keep the price to private patients constant. A hospital may reduce its quality or cut back on its provision of free care. Changes in the diversity of services the hospitals provide may arise. A labor change may occur as one example, resulting in fewer registered nurses being available to patients, which reduces the hospital’s costs. Poorer care may be given and these costs are absorbed by the patients.
**Cost-Shifting Among Private Practice Physicians**

Cost-shifting among physicians has been evaluated briefly over the last few years. Rice et al. (1996) examined surgical procedures to determine whether physicians raised the rates charged to their privately insured patients in response to Medicare reductions in 1989 and 1990. Data were examined from 1988 to 1991 before each reduction in Medicare reimbursement rates. No increase was seen in excess private charges (patients’ out-of-pocket expenses not paid by private insurers) nor in the average billed charges (reimbursement paid by insurance for privately insured patients) obtained by physicians. Thus the authors concluded that no evidence existed for cost-shifting by physicians.

Showalter’s study (1997) concluded much the same. Physician data from the “Physicians’ Practice Costs and Income Survey” conducted from 1983 to 1985 were examined. The author concludes that in response to lower Medicaid reimbursement rates, physicians actually lowered their charges. By doing this physicians were looking to maximize their revenues by attracting more private-pay and private-insured patients to offset lower Medicaid revenues. This finding contradicts what cost-shifting would anticipate. Rather than raise prices charged to non-Medicaid patients as predicted by a cost-shifting model, physicians could increase their profits by lowering their charges to attract more non-Medicaid patients. In addition, physicians tended to treat fewer Medicaid patients in response to lower Medicaid reimbursement rates.

Physicians look to maximize their profits by treating more patients at a lower reimbursement rate. As represented in Figure 5, physicians can lower their prices from $P_1$ to $P_2$ and thereby increase the number of patients they treat from $Q_1$ to $Q_2$. By lowering
their prices and thereby treating more private-pay patients, physicians can maximize their profits as represented by the shaded area.

FIGURE 5: Physician Profit Maximization

Not analyzed in these studies is the obvious evidence of physicians accepting different rates of reimbursement. If any of these reimbursement rates were below the costs of doing business then costs may be shifted to another group of patients. This type of finding would be evidence for cost-shifting.

Cost-Shifting among Retail Pharmacies

In the retail pharmacy industry, cost-shifting has been studied very little. In the 1990s three articles were written relating to the subject. The latest calculation of cost-shifting in the price of prescriptions was done in Georgia pharmacies (McMillan et al., 1990). Cost-shifting was calculated in both Independent and Chain pharmacies. Chain
pharmacies engaged in a larger cost-shift to the private pay patient than did the Independent pharmacies, although both sectors were engaged in the practice. Chains shifted an average of $0.49 per prescription to private pay customers while Independents shifted an average of $0.30 per prescription. The cost-shifting in the chains largely resulted from dealings with private third-party plans, and with Medicaid among the independents.

Pharmacies have been shown to incur extra expense dispensing third-party prescriptions compared to private pay prescriptions (Huey et al., 1995; Carroll, 1991). Huey et al. examined 10 independent pharmacies in the Atlanta area. The extra expense incurred from dispensing third-party prescriptions totaled $1.02 per prescription. Furthermore, a comparison of third-party reimbursements with the pharmacies’ usual prices to cash patients revealed decreases of $2.71 per prescription. Huey and coworkers note that these increased costs were not compensated for by nonprescription purchases made by third-party customers.

Carroll’s 1991 study involved a larger sample of 35 independent Virginia pharmacies. He determined the added cost of dispensing a third-party prescription to be $1.55. Of the total, $1.47 was attributed to third-party related personnel expenses and $0.08 in claim submission costs. The two studies provide ample evidence of increased costs for dispensing a third-party prescription. Simultaneously, pharmacies are receiving less revenue for dispensing third-party prescriptions compared with revenue from private-pay patrons.
Hypothesis

This study will determine whether or not Montana Independent Retail Pharmacies engage in third-party-induced cost-shifting. Costs of dispensing prescriptions by study pharmacies and drug costs will be compared to the reimbursement rates for three different groups of prescription customers: cash customers, Montana Medicaid customers and Express Scripts customers. Statistically lower rates of reimbursement for Montana Medicaid and Express Scripts patients in comparison with cash paying patients, in addition to evidence that Montana Medicaid or Express Scripts prescriptions are being dispensed at a loss on average, will be considered evidence of cost-shifting. The amount of cost-shift to cash paying patients will be quantified with respect to each program.

The null hypotheses are:

(H₀₁) No difference exists in the mean net reimbursement rate (dollar contribution of each prescription minus all-payer price) from prescriptions for cash paying patients, Montana Medicaid patients and patients covered under the MUS health plan (Express Scripts).

(H₁₁) The mean net reimbursement rate (dollar contribution of each prescription minus all-payer price) for prescriptions from cash paying patients is greater than that from Montana Medicaid patients or from patients covered under the MUS health plan.

(H₀₂) No difference exists in the mean net profit per prescription (reimbursement rate minus acquisition cost of the drug minus cost of dispensing) from prescriptions for cash paying patients, Montana Medicaid patients and patients covered under the MUS health plan.

(H₁₂) The mean net profit per prescription (reimbursement rate minus acquisition cost of the drug minus cost of dispensing) from prescriptions of cash paying patients is greater than that from Montana Medicaid patients or patients covered under the MUS health plan.

(H₀₃) Prescriptions from cash paying patients, Montana Medicaid patients and patients covered under the MUS health plan are being dispensed above the all-payer price (not at a loss).
(H₃) Prescriptions from cash paying patients, Montana Medicaid patients or patients covered under the MUS health plan are being dispensed below the all-payer price (at a loss).

The rejection of all three null hypotheses will be considered evidence of cost-shifting among this sample of Montana Independent Retail Pharmacies.
METHODOLOGY

Pharmacy Selection and Activities

A geographically representative convenience sample of six independent pharmacies from throughout Montana was recruited into the study. Due to the small number of pharmacies involved complete randomization could have lead to a geographically unrepresentative sample. Therefore, study pharmacies were chosen on the basis of location throughout the state and their willingness to participate in the study. Participating pharmacies completed data collection worksheets developed for the study which are described in detail later in this section.

The study was approved by The University of Montana Institutional Review Board (IRB) and the information obtained from each store has been kept confidential.

Each pharmacy was reimbursed $200 for their time in collecting the data. The pharmacies selected served both Montana Medicaid patients and Montana University System (MUS) health plan clients and were willing to participate in the study.

Specific inclusion criteria for each pharmacy were:

1) The pharmacy had to fill at least 75 prescriptions per weekday on average;
2) At least 10% of the pharmacy's prescription volume had to be covered by Montana Medicaid;
3) At least 10% of the pharmacy’s prescription volume had to include other third-party prescription programs and;
4) The pharmacy had to have a computer system capable of segregating prescription sales and cost data from customers who pay cash for their prescriptions and data from customers with third-party prescription coverage.

The 10% prescription volume by Montana Medicaid and third-party payers was chosen arbitrarily by the investigators.
Each of the six pharmacies were asked to collect data regarding the cost of
dispensing a prescription in their pharmacy as well as data pertaining to their costs and
reimbursement rates for each cash, Montana Medicaid and Express Scripts prescription.
Also, the demographics of the pharmacy's patients covered by Montana Medicaid,
Express Scripts, all third party prescription programs and cash paying patients were
collected.

Whether the pharmacies were located in a rural or urban area was determined.
Competition was established by the number of pharmacies located within a 25-mile radius
of each store.

At the beginning of the study period, each pharmacy manager or designee
completed a cost of dispensing data sheet (Appendix 1) based on D.C. Huffman's article
in the February, 1990 issue of the *NARD Journal* (pp. 20-24). In addition, the pharmacy's
current third party reimbursement rates from Montana Medicaid and Express Scripts were
collected. The percentages of cash, third-party and Montana Medicaid business were also
reported by each pharmacy.

Next, cash prescription data were collected. Commencing on Day 1 of the study,
the pharmacy manager or designee of the pharmacy manager completed the cash
prescription data sheet (Appendix 2) using 100 consecutive private pay prescriptions.
Each prescription was assigned a number and the following information was collected for
each prescription: the drug name and strength, drug manufacturer, quantity dispensed,
National Drug Code, package size, pharmacy cost per package, the price charged to the
patient and whether the drug was a brand name or generic drug.
**Net Contribution Calculations**

Using the above data, the gross reimbursement was tallied for each prescription and the mean net reimbursement for dispensing a prescription for each pharmacy was calculated. Using the formulas supplied by the pharmacy managers, gross reimbursements were calculated for each of the same prescriptions as if they had been dispensed to Montana Medicaid patients or Montana University System (Express Scripts) patients. Each pharmacy's cost of dispensing was added to their ingredient cost to arrive at the total cost for each prescription dispensed. The total cost of each prescription was then subtracted from the total revenue obtained from that prescription to obtain the net dollar contribution (net profit) or liability of that prescription. Total contributions for the 100 prescriptions of each pharmacy were tallied. The averaged revenue per prescription for the pharmacy’s cash, Montana Medicaid, and Express Scripts groups determined if a positive net profit existed for prescriptions in each payment group. Prescriptions were then pooled and analyzed to determine if cost-shifting occurred among the independent pharmacies as a whole.

**Cost-Shift Calculations**

Cost-shifting determinations were calculated for each pharmacy as well as the entire prescription set. Analysis of variance (ANOVA) was used to search for differences in the net dollar contribution for each prescription reimbursement program. An alpha level of 0.05 was selected by convention to define statistical significance. The ANOVA test was selected to analyze the data because one dependent variable (difference in net dollar contribution) was evaluated across three different groups (cash paying patients, Montana Medicaid patients and Montana University System patients). A significant ANOVA along
with evidence of a Montana Medicaid or Express Scripts reimbursement rate resulting in a net liability (i.e. dispensing a prescription below cost) served as evidence for cost-shifting.

Attempts to quantify cost-shifting in the hospital market have defined the cost shift empirically as the difference between the average price charged to private paying patients and a hypothetical all-payer rate (McMillan et al., 1990). The all-payer rate is defined as the single price that, if charged to every customer, would yield the same aggregate revenue produced by an existing differential pricing/reimbursement structure.

Two assumptions are made in an all-payer analytical framework as applied to pharmacies (McMillan et al., 1990). The first is that pharmacies can meet target revenues under an all-payer pricing structure. This is expressed in the following equation:

**EQ1: (QTP*APP) + (QPP*APP) = TR**

\[
\begin{align*}
QTP & \text{ – The quantity of third-party prescriptions dispensed;} \\
QPP & \text{ – The quantity of private-pay prescriptions dispensed;} \\
APP & \text{ – The all payer price (the single price which if charged to all payers would generate the target revenue requirement);} \\
TR & \text{ – The pharmacy’s target revenue.}
\end{align*}
\]

The second assumption is that pharmacies achieve target revenues by setting private-pay prices which exceed the all-payer rate by an amount sufficient to balance the reduced revenue of third-party reimbursement rates below the all-payer price. This is represented in the following equation:
EQ2: \( QTP(OTP) + QPP \times (APP + \frac{QTP(\text{APP} - OTP)}{QPP}) = TR \)

\( OTP \) – The third-party reimbursement rate observed in the market.

In analyzing the all-payer approach, the existence of private-pay prices above that of the all-payer price has been considered evidence of cost-shifting activity. Differential prices may also result from a simple lowering of third-party reimbursement rates in the absence of cost-shifting. So a valid cost-shifting inference depends upon evidence of a private-pay increase associated with increasing third-party presence. The all-payer methodology implicitly characterizes this relationship as shown below (McMillan et al., 1990) by combining the above two equations:

\[ EQ3: \text{OPP} = \frac{QTP}{QPP} \times (APP - OTP) + APP \]

\( \text{OPP} \) – The observed private-pay market price.

Adjusting the above equation into a gross margin form (reflecting the sales residual contributing toward operating cost and profit, and which controls price variance due to different acquisition cost categories) yields the following equation:

\[ EQ4: \text{OPP} - AC = \frac{QTP}{QPP} \times (APP - TPP) + APP - AC \]

\( AC \) – Ingredient acquisition cost.

With the above all-payer model, the average gross margin generated from a private-pay prescription is a linear function of the third-party to private-pay prescription volume by cost-shifting pharmacies. The slope represents the degree by which the average
third-party reimbursement falls below an average all-payer price and the intercept equals the average all-payer margin on prescriptions. So the cost shift premium is given by:

\[ \text{EQ5: OPP} - \text{APP} = \frac{\text{QTP} \times (\text{APP} - \text{TPP})}{\text{QPP}}. \]

Using the above theoretical basis, a cost shift regression equation was derived using the private pay price as the dependent variable. This allows searching for evidence of cost-shifting using a multiple regression model.

In the above equation, the cost shift equals a discount given to third-party patients (\(\text{APP}-\text{TPP}\)) in relation to the quantity of third-party prescriptions dispensed compared to that of private pay prescriptions dispensed. The addition of the all-payer price (\(\text{APP}\)) to both sides of the equation yields:

\[ \text{EQ6: OPP} = \left[ \frac{\text{QTP} \times (\text{APP} - \text{TPP})}{\text{QPP}} \right] + \text{APP}. \]

The private cash price depends upon the all-payer price (\(\text{APP}\)), the discount offered to Montana Medicaid and Express Scripts patients (\(\text{APP}-\text{TPP}\)) and a demographic variable related to the amount of competition each pharmacy (\(\text{QTP}/\text{QPP}\)). The all-payer price directly relates to the acquisition cost of each prescription; the discount relates to the reimbursement each pharmacy grants to Montana Medicaid and Express Scripts patients; and the demographic variable relates the number of competing pharmacies within a 25-mile radius of a given study pharmacy.

The all-payer price is the single price that, if charged to all payers (third-party and private-pay) would meet the target revenue requirement for that pharmacy (McMillan et al., 1990). As explained later, in the present study the all-payer price was set at each
store's breakeven point for dispensing a prescription which is different from McMillan's definition based upon target revenue. By setting the all-payer price equal to the cost of dispensing a prescription (that is, the breakeven point), variations in the target net profits between stores is removed and cost-shifting can more accurately be assessed.

Accordingly, the existence of private-pay prices above an all-payer price in conjunction with third-party reimbursement rates below the all-payer price is considered evidence of cost-shifting.

Using multiple regression, variables associated with pharmacies charging higher cash prices to dispense identical prescriptions to different patients were determined. The variables included acquisition cost, Montana Medicaid reimbursement, Express Scripts reimbursement and a market competition variable. These variables are expressed in the following equation:

\[
EQ7: CP = \alpha_1 AC + \alpha_2 MM + \alpha_3 EXP + \alpha_4 MC + C
\]

- CP – Private-pay customers charged price;
- AC – Acquisition cost of the drug;
- MM – Montana Medicaid reimbursement;
- EXP – Express Scripts reimbursement;
- MC – Market competition (number of competing pharmacies in the area);
- C – Constant.
ASSUMPTIONS AND LIMITATIONS

The study assumptions include the following:

1) Each study pharmacy dispenses the same types of prescriptions to cash prescription customers, Medicaid patients and Express Scripts patients.

2) The net profit margin is the same for every prescription dispensed in the study. This assumption controls for the possibility that pharmacies may have products which are loss leaders, i.e. products with a lower markup and less profit, to entice consumers into their store.

The study limitations include the following:

1) A search of the state of Montana yielded only six independent pharmacies which agreed to participate in the study. The analysis was conducted on 600 prescriptions obtained from these pharmacies, 100 prescriptions from each store. Increasing the number of stores along with the number of prescriptions would improve both the internal and external validity of the study.

2) Cash price data were generated using each pharmacy’s price charged to cash-paying patients. The reimbursement rates for Medicaid and Express Scripts patients were derived using reimbursement formulas provided by the participating pharmacies. A comparison of the reimbursement rates from each payment source for the same prescription was then conducted. Another, possibly more accurate, approach would be to collect third-party data directly from the participating pharmacies, rather than use Express Scripts as a surrogate. Actual third-party prescriptions dispensed to patients could then be analyzed. Express Scripts was chosen because it is the plan the
University of Montana employees use and was felt to be representative of all third-party prescription plans.

3) Independent Retail Pharmacies were analyzed and may serve different clientele than other sectors of community pharmacy.

4) The data estimating the cost of dispensing a prescription were all self-reported by the pharmacists. Data which looked suspicious were verified verbally with the participating pharmacies, but remained self-reported nonetheless.

5) All of the pharmacies which agreed to participate in the study were from rural communities. This may lead into question how applicable the results might be to community retail pharmacies in urban settings.
RESULTS

Pharmacy Characteristics

Only six stores throughout the state of Montana agreed to participate in the study. Being unable to recruit a larger number of independent pharmacies, inclusion criteria were relaxed to allow all six pharmacies to enroll. The independent pharmacies were located in rural areas with populations less than 25,000; five of these were located in towns of less than 10,000 population. Data for 100 private pay prescriptions along with the drug cost for each prescription were collected from each store. Unusable prescription data for four prescriptions were discarded and a total of 596 prescriptions were analyzed. The discarded data included undecipherable information from the cash prescription data sheets.

Pharmacy Reimbursement

The average reimbursement received for dispensing a cash prescription for each pharmacy is given in Table 1. When the data were analyzed initially, Store 3 reported its actual cost for the medication and the AWP (Average Wholesale Price) to be the same. Most pharmacies obtain their medications at a price discounted from AWP. When the data were combined it appeared that on average this pharmacy was losing money on every prescription it dispensed. The pharmacy could not do this and stay in business; therefore, the pharmacy was contacted for clarification of its data.

Apparently the pharmacy indeed obtained its medications from its wholesaler at a price discounted from AWP and a simple error had occurred. The corrected data were obtained and the analysis continued. Since a mistake in the pharmacy’s reimbursement forms occurred, a review of this store’s cost of dispensing questionnaire (Appendix 1) was
also performed. Changes to that questionnaire will be discussed under “Cost of Dispensing a Prescription.”

Next, the reimbursement that would have been obtained had the same prescription been dispensed to a Montana Medicaid or Express Scripts patient was calculated for each prescription. Third-party prices were determined by using the third-party contracted reimbursement formulas provided by each store for their Medicaid and Express Scripts prescriptions. These formulas are based on Average Wholesale Price (AWP) minus a percentage plus a dispensing fee. Both third-party carriers also utilize Maximum Acquisition Costs (MAC) for certain generic drugs which were considered in the reimbursement scheme. For these generic medications, the insurer only reimbursed a maximum price for the prescription and did not base reimbursement upon AWP. The average payment per prescription under each reimbursement condition for each store is shown in Table 1.

**TABLE 1: Average Reimbursement Rates for Each Pharmacy**

<table>
<thead>
<tr>
<th>Store (Number of Prescriptions)</th>
<th>Average Cash Prescription Price (Standard Deviation)</th>
<th>Average Medicaid Price (Standard Deviation)</th>
<th>Average Express Scripts Price (Standard Deviation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (n=100)</td>
<td>$37.28 ($38.87)</td>
<td>$30.31 ($35.49)</td>
<td>$28.64 ($34.59)</td>
</tr>
<tr>
<td>2 (n=99)</td>
<td>$21.91 ($21.40)</td>
<td>$19.59 ($21.61)</td>
<td>$17.20 ($20.81)</td>
</tr>
<tr>
<td>3 (n=97)</td>
<td>$21.18 ($21.19)</td>
<td>$19.28 ($20.44)</td>
<td>$17.27 ($19.92)</td>
</tr>
<tr>
<td>4 (n=100)</td>
<td>$20.74 ($15.77)</td>
<td>$18.85 ($16.55)</td>
<td>$16.71 ($16.06)</td>
</tr>
<tr>
<td>5 (n=100)</td>
<td>$25.80 ($22.97)</td>
<td>$26.27 ($25.17)</td>
<td>$23.93 ($24.10)</td>
</tr>
<tr>
<td>6 (n=100)</td>
<td>$29.17 ($37.32)</td>
<td>$25.13 ($38.51)</td>
<td>$23.06 ($37.47)</td>
</tr>
</tbody>
</table>
Market

The prescription mix was then evaluated for each pharmacy. The percentage of Medicaid, Express Scripts and total third-party prescriptions filled by each pharmacy is given in Table 2. The “Total Third-Party Prescriptions” category includes Medicaid and Express Scripts patients as well as other third party programs in which patients participate at the pharmacies.

The percentage of patients participating in all third-party programs (excluding Medicaid) was over 10% in every store. Stores 3 and 6, however, failed to meet the inclusion criteria for the percentage of Medicaid patients. As stated above, inclusion criteria were relaxed due to the small number of independent pharmacies willing to participate. Since the 10% Medicaid prescription volume was chosen arbitrarily, the two stores were judged to fill an adequate percentage of Medicaid prescriptions to justify their inclusion. In addition, increasing the sample size was felt to be more important than the strict adherence to this inclusion criterion.

Competition for each study pharmacy was evaluated using local phone directories to determine the number of competing pharmacies in the town where each pharmacy was located. Since every store was located in rural Montana this method was deemed acceptable to locate competing pharmacies within a 25-mile radius. The number of competing pharmacies is also given in Table 2.
TABLE 2: Percentage of Third-Party Prescriptions Filled by Study Pharmacies and Number of Competing Pharmacies

<table>
<thead>
<tr>
<th>Store</th>
<th>Total Percentage Third-Party Prescriptions</th>
<th>Percentage Medicaid Prescriptions</th>
<th>Percentage Express Scripts Prescriptions</th>
<th>Number of Competing Pharmacies*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>28%</td>
<td>18%</td>
<td>2%</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>55%</td>
<td>25%</td>
<td>3.6%</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>30%</td>
<td>7%</td>
<td>6.9%</td>
<td>Greater than 3</td>
</tr>
<tr>
<td>4</td>
<td>35%</td>
<td>20%</td>
<td>1.4%</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>35%</td>
<td>15%</td>
<td>2%</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>50%</td>
<td>9%</td>
<td>5.6%</td>
<td>2</td>
</tr>
</tbody>
</table>

* Defined as the number of retail pharmacies within a 25-mile radius of the study pharmacies.

Cost of Dispensing a Prescription

Each pharmacy completed a worksheet to determine their cost of dispensing a prescription, Appendix 1 (Huffman, 1990). The mean cost of dispensing a prescription (+/- standard deviation) for the six independent pharmacies was determined to be $6.12 +/- $0.85. A summary of the cost of dispensing a prescription for each store is given in Table 3.

TABLE 3: Cost of Dispensing a Prescription for Study Pharmacies*

<table>
<thead>
<tr>
<th>Store</th>
<th>Average Cost of Dispensing a Prescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$6.17</td>
</tr>
<tr>
<td>2</td>
<td>$6.40</td>
</tr>
<tr>
<td>3</td>
<td>$5.77</td>
</tr>
<tr>
<td>4</td>
<td>$6.98</td>
</tr>
<tr>
<td>5</td>
<td>$5.82</td>
</tr>
<tr>
<td>6</td>
<td>$4.61</td>
</tr>
</tbody>
</table>

*Based on Huffman (1990)
An initial analysis of the data for the cost of dispensing a prescription was conducted, finding that two stores had outlier data. Store 3 had two problems with the data submitted. First, the acquisition price and actual wholesale price of the drugs were identical as discussed above. Second, the cost of dispensing a prescription seemed to be overestimated relative to the other study pharmacies. Both of these mistakes lead to an appearance that the pharmacy was losing money on every prescription which was being dispensed, including the cash prescriptions.

A review of the dispensing costs for Store 3 was conducted because an error had already been detected in its data on reimbursement rates. The original cost of dispensing a prescription for Store 3 was $6.97, second highest only to Store 4. Upon review of Store 3’s data, it was discovered that the store manager allocated 100% of his/her time to dispensing functions in the prescription department, leaving no time for management of the store. The pharmacy was contacted for a clarification of the data during which the salary allocated to pharmacists was also discovered to be high (Appendix 1). A change was made in the percentage of time the pharmacy manager spent dispensing prescriptions from 100% to 50% of the time and pharmacist salary expenses were reduced from $63,300 to $53,300. With these changes in the cost of dispensing questionnaire, the average cost to dispense a prescription was reduced from $6.97 to $5.77 as reported in Table 3.

In contrast to Store 3, the cost of dispensing a prescription for Store 6 seemed to be unrealistically low (Table 3). Excluding Store 6, the mean cost of dispensing a prescription was $6.42 +/- $0.46. The cost of dispensing a prescription for Store 6 was well below three standard deviations of the mean from the other five stores. Therefore,
the store was contacted for clarification, and the data were determined to be true as reported. These data were therefore included in the analysis as originally reported.

Using the cost of dispensing a prescription for each pharmacy along with the acquisition cost for each drug, an all-payer price was calculated for each prescription. The existence of private-pay prices above an all-payer price in conjunction with third-party reimbursement rates below the all-payer price was considered initial evidence of cost-shifting.

**Net Reimbursement**

The net reimbursement for each prescription was calculated. The net reimbursement is the gross reimbursement minus the all-payer price (i.e. the store’s break-even point). Again, the all-payer price is the acquisition cost for each drug plus the cost of dispensing a prescription. The cost of dispensing a prescription varied between each pharmacy as discussed above.

Using ANOVA, four of the six pharmacies showed evidence of cost-shifting. The net reimbursement for each of the stores is given in Table 4.
### TABLE 4: Differences in Net Reimbursement*

<table>
<thead>
<tr>
<th>Store</th>
<th>Net Cash Reimbursement$</th>
<th>Net Medicaid Reimbursement$</th>
<th>Net Express Scripts Reimbursement$</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$8.68</td>
<td>$1.70</td>
<td>$0.03</td>
<td>$F = 42.13; df = 2; p&lt;0.001</td>
</tr>
<tr>
<td>2</td>
<td>$3.30</td>
<td>$0.98</td>
<td>($1.42)</td>
<td>$F = 16.37; df = 2; p&lt;0.001</td>
</tr>
<tr>
<td>3</td>
<td>$0.85</td>
<td>($1.04)</td>
<td>($3.05)</td>
<td>$F = 28.07; df = 2; p&lt;0.001</td>
</tr>
<tr>
<td>4</td>
<td>$1.41</td>
<td>($0.48)</td>
<td>($2.62)</td>
<td>$F = 15.42; df = 2; p&lt;0.001</td>
</tr>
<tr>
<td>5</td>
<td>$1.77</td>
<td>$2.25</td>
<td>($0.09)</td>
<td>$F = 10.49; df = 2; p&lt;0.001</td>
</tr>
<tr>
<td>6</td>
<td>$7.81</td>
<td>$3.77</td>
<td>$1.70</td>
<td>$F = 13.53; df = 2; p&lt;0.001</td>
</tr>
</tbody>
</table>

* Net reimbursement = Gross Reimbursement - All-Payer Price (Break-Even Point)

# Represents the same average net reimbursement for 100 prescriptions by different payers

The difference in reimbursement rates between cash, Medicaid and Express Scripts patients is statistically significant in each of the stores. Cost-shifting occurs in Stores 2, 3, 4 and 5, as these stores incurred losses dispensing Medicaid and/or Express Scripts prescriptions and had surpluses in dispensing cash and/or Medicaid prescriptions.

**Pharmacy Cost-Shift**

Due to the small sample size collected from each pharmacy, all of the prescriptions were combined to determine if cost-shifting was occurring among the study pharmacies as a whole. Across the six stores, $0.90 per prescription is being shifted to cash and/or Medicaid patients (Table 5).
TABLE 5: Independent Pharmacy Cost-Shift

<table>
<thead>
<tr>
<th>Prescriptions</th>
<th>Net Cash Reimbursement</th>
<th>Net Medicaid Reimbursement</th>
<th>Net Express Scripts Reimbursement</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=596</td>
<td>$3.99</td>
<td>$1.21</td>
<td>($0.90)</td>
<td>F = 90.1; df = 2; p&lt;0.001</td>
</tr>
</tbody>
</table>

Regression Analysis

Inserting data into Equation 7 yielded the following regression results as shown in Table 6.

TABLE 6: Regression Analysis
Dependent Variable = Cash Price

<table>
<thead>
<tr>
<th>Stores</th>
<th>C</th>
<th>AC</th>
<th>MM</th>
<th>ES</th>
<th>MC</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Stores</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beta&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.29</td>
<td>0.31</td>
<td>-0.19</td>
<td>0.86</td>
<td>-0.02</td>
<td>0.948</td>
</tr>
<tr>
<td>Significance&lt;sup&gt;b&lt;/sup&gt;</td>
<td>p&lt;0.001</td>
<td>p=0.068</td>
<td>p&lt;0.001</td>
<td>p=0.077</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1, 2, 5 &amp; 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beta&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5.04</td>
<td>0.28</td>
<td>-0.18</td>
<td>0.88</td>
<td>0.05</td>
<td>0.953</td>
</tr>
<tr>
<td>Significance&lt;sup&gt;b&lt;/sup&gt;</td>
<td>p&lt;0.001</td>
<td>p=0.189</td>
<td>p&lt;0.001</td>
<td>p&lt;0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 &amp; 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beta&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.93</td>
<td>0.58</td>
<td>-0.23</td>
<td>0.63</td>
<td>-0.03</td>
<td>0.94</td>
</tr>
<tr>
<td>Significance&lt;sup&gt;b&lt;/sup&gt;</td>
<td>p&lt;0.001</td>
<td>p=0.091</td>
<td>p&lt;0.001</td>
<td>p=0.092</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 &amp; 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beta&lt;sup&gt;a&lt;/sup&gt;</td>
<td>11.28</td>
<td>0.41</td>
<td>-0.05</td>
<td>0.62</td>
<td>-0.03</td>
<td>0.96</td>
</tr>
<tr>
<td>Significance&lt;sup&gt;b&lt;/sup&gt;</td>
<td>p&lt;0.001</td>
<td>p=0.808</td>
<td>p=0.002</td>
<td>p=0.073</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Variables
C – Constant
AC – Acquisition Cost
MM – Montana Medicaid
ES – Express Scripts
MC – Market Competition

<sup>a</sup> – Standardized Regression Coefficient
<sup>b</sup> – Level of Significance
The first regression analysis included data from all of the stores. The MM (Montana Medicaid reimbursement) and MC (market competition) variables in Equation 7 were not significantly correlated to the dependent variable cash price, and therefore drop out of the equation. Acquisition Cost and Express Scripts reimbursement were found to be significantly related to the cash price reimbursement. Therefore, Express Scripts reimbursement greatly influences cash price. Montana Medicaid reimbursement also influences cash price, but to a much lesser extent than Express Scripts reimbursement.

Further analysis was conducted using regression to determine if Montana Medicaid contributed to cost-shifting in Stores 3 and 4. The first regression looks at Stores 1, 2, 5 and 6 where Montana Medicaid reimbursement is above the all-payer price. The results are shown in Table 6. The removal of Stores 3 and 4 caused the market competition variable to become significantly correlated to the dependent variable; however, the Montana Medicaid variable remained non-significant. Likewise, the ANOVA analysis did not identify a cost-shift from Montana Medicaid in Stores 1, 2, 5 and 6. The next analysis involved Stores 3 and 4, where the Montana Medicaid and Express Scripts reimbursement is below the all-payer price. The results appear in Table 6. Here again the significant variables are Acquisition Cost and Express Scripts. The Montana Medicaid and Market Competition variables remain non-significant, indicating that cost-shifting is occurring from Express Scripts and not from Medicaid to the cash paying patients in these stores.

Finally, an analysis was conducted on Stores 1 and 6 where the reimbursement was above the all-payer price for all groups, indicating the absence of cost-shifting. These results are also shown in Table 6. Using this model, the Acquisition Cost and Express
Scripts variables remain significant, while Montana Medicaid and Market Competition are non-significant.

**Correlation**

An additional analysis was performed to determine if a correlation existed between the degree of cost-shifting in each store and the percentage of Montana Medicaid and Express Scripts prescriptions each store dispensed. No significant correlations were detected.

**Mean Weighted Revenue**

To determine if bias was introduced into the study by contacting Stores 3 and 6 a second time, and to determine the reduction in revenue each pharmacy incurs by serving Montana Medicaid and third-party patients (represented by Express Scripts), the mean weighted revenue was quantified for each store’s prescription volume. As displayed in Table 2, each manager reported the percentage of cash, Montana Medicaid and total third-party patients for their store. In Table 7, “third party” represents all insurance programs other than Montana Medicaid. This was calculated by subtracting the percentage of Montana Medicaid patients from the total percentage of all third party patients. The cash net reimbursement was multiplied by the percentage of cash patients giving the cash prescriptions contribution to the weighted revenue for cash prescriptions. The same process was used for Montana Medicaid and third party prescriptions giving the weighted revenue for each. The mean revenues were then added together to obtain the weighted average revenue per prescription for each store.

The mean weighted revenue across all stores (Table 7) was compared to the mean weighted revenue across Stores 1, 2, 4 and 5 (Table 8) who were contacted once. The
mean weighted revenue and standard deviation are virtually identical. Therefore, no bias was introduced by contacting Stores 3 and 6.
TABLE 7: Mean Weighted Revenue (All Stores)

<table>
<thead>
<tr>
<th>Store 1</th>
<th>Net Reimbursement</th>
<th>Percent Patients</th>
<th>Weighted Revenue</th>
<th>Total Revenue Per Prescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$8.68</td>
<td>72%</td>
<td>$6.25</td>
<td></td>
</tr>
<tr>
<td>MM</td>
<td>$1.70</td>
<td>18%</td>
<td>$0.31</td>
<td></td>
</tr>
<tr>
<td>3rd Party</td>
<td>$0.03</td>
<td>10%</td>
<td>$0.003</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>$6.56</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Store 2</th>
<th>Net Reimbursement</th>
<th>Percent Patients</th>
<th>Weighted Revenue</th>
<th>Total Revenue Per Prescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$3.30</td>
<td>45%</td>
<td>$1.49</td>
<td></td>
</tr>
<tr>
<td>MM</td>
<td>$0.98</td>
<td>25%</td>
<td>$0.25</td>
<td></td>
</tr>
<tr>
<td>3rd Party</td>
<td>$(1.42)</td>
<td>30%</td>
<td>$(0.43)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>$1.31</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Store 3</th>
<th>Net Reimbursement</th>
<th>Percent Patients</th>
<th>Weighted Revenue</th>
<th>Total Revenue Per Prescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$0.85</td>
<td>70%</td>
<td>$0.60</td>
<td></td>
</tr>
<tr>
<td>MM</td>
<td>$(1.04)</td>
<td>7%</td>
<td>$(0.07)</td>
<td></td>
</tr>
<tr>
<td>3rd Party</td>
<td>$(3.05)</td>
<td>23%</td>
<td>$(0.70)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>$(0.17)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Store 4</th>
<th>Net Reimbursement</th>
<th>Percent Patients</th>
<th>Weighted Revenue</th>
<th>Total Revenue Per Prescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$1.41</td>
<td>65%</td>
<td>$0.92</td>
<td></td>
</tr>
<tr>
<td>MM</td>
<td>$(0.48)</td>
<td>20%</td>
<td>$(0.10)</td>
<td></td>
</tr>
<tr>
<td>3rd Party</td>
<td>$(2.62)</td>
<td>15%</td>
<td>$(0.39)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>$0.43</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Store 5</th>
<th>Net Reimbursement</th>
<th>Percent Patients</th>
<th>Weighted Revenue</th>
<th>Total Revenue Per Prescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$1.77</td>
<td>65%</td>
<td>$1.15</td>
<td></td>
</tr>
<tr>
<td>MM</td>
<td>$2.25</td>
<td>15%</td>
<td>$0.34</td>
<td></td>
</tr>
<tr>
<td>3rd Party</td>
<td>$(0.09)</td>
<td>20%</td>
<td>$(0.02)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>$1.47</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Store 6</th>
<th>Net Reimbursement</th>
<th>Percent Patients</th>
<th>Weighted Revenue</th>
<th>Total Revenue Per Prescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$7.81</td>
<td>50%</td>
<td>$3.91</td>
<td></td>
</tr>
<tr>
<td>MM</td>
<td>$3.77</td>
<td>9%</td>
<td>$0.34</td>
<td></td>
</tr>
<tr>
<td>3rd Party</td>
<td>$1.70</td>
<td>41%</td>
<td>$0.70</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>$4.95</td>
</tr>
</tbody>
</table>

Mean Weighted Revenue Stores 1-6 (SD) $2.43 (+/- $2.70)

3rd Party – All patients using third-party insurance excluding Montana Medicaid
Table 8: Mean Weighted Revenue (Stores 1, 2, 4 & 5)

<table>
<thead>
<tr>
<th>Store 1</th>
<th>Net Reimbursement</th>
<th>Percent Patients</th>
<th>Weighted Revenue</th>
<th>Total Revenue Per Prescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$8.68</td>
<td>72%</td>
<td>$6.25</td>
<td></td>
</tr>
<tr>
<td>MM</td>
<td>$1.70</td>
<td>18%</td>
<td>$0.31</td>
<td></td>
</tr>
<tr>
<td>3rd Party</td>
<td>$0.03</td>
<td>10%</td>
<td>$0.003</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>$6.56</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Store 2</th>
<th>Net Reimbursement</th>
<th>Percent Patients</th>
<th>Weighted Revenue</th>
<th>Total Revenue Per Prescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$3.30</td>
<td>45%</td>
<td>$1.49</td>
<td></td>
</tr>
<tr>
<td>MM</td>
<td>$0.98</td>
<td>25%</td>
<td>$0.25</td>
<td></td>
</tr>
<tr>
<td>3rd Party</td>
<td>($1.42)</td>
<td>30%</td>
<td>($0.43)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>$1.31</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Store 4</th>
<th>Net Reimbursement</th>
<th>Percent Patients</th>
<th>Weighted Revenue</th>
<th>Total Revenue Per Prescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$1.41</td>
<td>65%</td>
<td>$0.92</td>
<td></td>
</tr>
<tr>
<td>MM</td>
<td>($0.48)</td>
<td>20%</td>
<td>($0.10)</td>
<td></td>
</tr>
<tr>
<td>3rd Party</td>
<td>($2.62)</td>
<td>15%</td>
<td>($0.39)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>$0.43</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Store 5</th>
<th>Net Reimbursement</th>
<th>Percent Patients</th>
<th>Weighted Revenue</th>
<th>Total Revenue Per Prescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$1.77</td>
<td>65%</td>
<td>$1.15</td>
<td></td>
</tr>
<tr>
<td>MM</td>
<td>$2.25</td>
<td>15%</td>
<td>$0.34</td>
<td></td>
</tr>
<tr>
<td>3rd Party</td>
<td>($0.09)</td>
<td>20%</td>
<td>($0.02)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>$1.47</td>
<td></td>
</tr>
</tbody>
</table>

Mean Weighted Revenue Stores 1-6 (SD) $2.44 (+/- $2.78)

Mean weighted revenue figures were also used to examine the reduction in total prescription revenue from serving third-party patients. Without third-party patients, pharmacists would be reimbursed 100% by cash prescriptions. Subtracting the cash revenue per prescription from the current total revenue per prescription gives the reduction in revenue the pharmacy is incurring by dispensing third-party prescriptions.
On average, the revenue reduction is $1.55 per prescription in this sample of independent pharmacies as shown in Table 9.

**Table 9: Reduction in Total Revenue per Prescription**

<table>
<thead>
<tr>
<th>Store</th>
<th>All Cash Prescriptions$^a$</th>
<th>Total Revenue Per Prescription$^b$</th>
<th>Reduction in Revenue Per Prescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>Store 1</td>
<td>$8.68</td>
<td>$6.56</td>
<td>$2.12</td>
</tr>
<tr>
<td>Store 2</td>
<td>$3.30</td>
<td>$1.31</td>
<td>$1.99</td>
</tr>
<tr>
<td>Store 3</td>
<td>$0.85</td>
<td>($0.17)</td>
<td>$1.02</td>
</tr>
<tr>
<td>Store 4</td>
<td>$1.41</td>
<td>$0.43</td>
<td>$0.98</td>
</tr>
<tr>
<td>Store 5</td>
<td>$1.77</td>
<td>$1.47</td>
<td>$0.30</td>
</tr>
<tr>
<td>Store 6</td>
<td>$7.81</td>
<td>$4.95</td>
<td>$2.86</td>
</tr>
</tbody>
</table>

**Mean Reduction in Revenue Stores 1-6 (SD)**  
$1.55 (+/- $0.94)

$^a$ Assuming that the maximum cash price was paid for each prescription.

$^b$ Calculated by net reimbursement for cash, Montana Medicaid and third-party prescriptions times the percentage of cash, Montana Medicaid and third-party prescriptions, respectively.
DISCUSSION

The mean net reimbursement rate (dollar contribution of each prescription minus all-payer price) for prescriptions from cash paying patients is greater than that from Montana Medicaid patients or from patients covered under the MUS health plan (Table 4), rejecting $H_0^1$. It is important to note that these different reimbursement rates are for dispensing the exact same medications.

The mean net profit per prescription (reimbursement rate minus acquisition cost of the drug minus cost of dispensing) from prescriptions of cash paying patients is greater than that from Montana Medicaid patients or patients covered under the MUS health plan (Table 5), rejecting $H_0^2$.

Prescriptions from cash patients, Montana Medicaid patients or patients covered under the MUS health plan are being dispensed below the all-payer price (at a loss), rejecting $H_0^3$. Because $H_0^1$, $H_0^2$ and $H_0^3$ are rejected, cost-shifting is occurring.

As the number of patients covered by third-party payers increases, the ability to cost-shift to the cash paying patients will diminish. By accepting contracts below the cost of dispensing a prescription, independent pharmacies risk losing money by serving patients whose prescriptions are covered by third-party payers. Cost-shifting has been a way to operate the pharmacy without losing money. By continuing to serve third-party patients with low reimbursement rates many pharmacies whose costs exceed reimbursement rates may forced to go out of business. Rural communities may lose valuable access to what may be their only source of health care in the local area.

Analyzing the combined multiple regression equations for all of the stores, the Montana Medicaid reimbursement and Market Competition were not significant variables
in cost-shifting. It was surprising that the Montana Medicaid reimbursement was not correlated with the cash price. With the additional evidence that the Montana Medicaid reimbursement was above the all-payer-price suggests that Montana Medicaid costs are not being shifted from the Medicaid program to the cash paying patient. Another surprise was that the market competition variable was not significantly correlated to cash price. One would assume that the less competition the pharmacy had, the higher their prices would be. This was not the case.

The variables Acquisition Cost and Express Scripts reimbursement were significantly correlated to cash price for all pharmacies combined. A significant Acquisition Cost variable was not a surprise; the higher a prescription’s acquisition cost, the higher cash prices become to the consumer. In assessing the significant Express Scripts reimbursement, it is logical to assume that the Cash Price and Express Scripts variables should be correlated. However, in assessing this relationship more closely, it becomes apparent that every $1.00 paid by a cash-paying patient equates to an $0.86 reimbursement by the Express Scripts patient. Compounded with the evidence that Express Scripts reimbursement is under the all-payer price is supportive evidence of cost-shifting. The cost-shift from the Express Scripts patient to the cash paying patient was determined to be $0.90. So in a general sense, if the same prescription is dispensed to an Express Scripts patient and a cash paying patient, an average cost-shift of $0.90 results to the cash paying patient.

The $0.90 per prescription is much greater than the $0.49 cost-shift associated with third-party payers discovered by McMillan et al. in 1990. As the number of third-
party payers in the market continues to increase, it is not surprising to see an increase in
the amount of the cost shift over the past eight years.

Further regression analysis was conducted on groups of similar stores’ net
reimbursements in cash, Montana Medicaid and Express Scripts prescriptions. Analyzing
the stores broken down into groups leads to much the same conclusion.

In Stores 3 and 4, Montana Medicaid and Express Scripts reimbursements fell
below the all-payer-price leading to their removal of from the first group. This left Stores
1, 2, 5 and 6 for regression analysis. The variables Acquisition Cost and Express Scripts
remained significant and the Montana Medicaid variable non-significant. However, within
the group, differences are apparent. With a positive net reimbursement for all three
markets, Stores 1 and 6 appear not to be cost-shifting. In contrast, Stores 2 and 5 show
cost-shifting from the Express Scripts program to the cash paying patient. However,
when assessing Stores 1, 2, 5 and 6 together, it is apparent that Express Scripts is
consistently reimbursing $0.88 for every dollar spent by the cash paying patient,
representing at least price discrimination in these pharmacies.

In addition, the Market Competition variable for this group of stores (1, 2, 5 & 6)
is significant. Surprisingly, the beta coefficient is positive suggesting that as the amount of
competition increases, the cash price increases. The opposite would be expected. As
more competition enters the market, a decrease in the cash price is intuitively predicted.
However, with the small sample size and a relatively small beta coefficient (indicating that
not much of a price change occurs with increased competition), it is difficult to determine
if a difference in price actually exists due to market competition in these four pharmacies.
Stores 3 and 4 were next combined for analysis. Both stores had negative net reimbursements for Montana Medicaid and Express Scripts prescriptions; therefore, one would expect that cost-shifting is occurring from both the Medicaid and Express Scripts programs in the pharmacies. Somewhat surprisingly, however, cost-shifting was only found to be occurring from Express Scripts patients to cash paying patients. The variables Acquisition Cost and Express Scripts were significant, while Montana Medicaid and Market Competition were not. Therefore, cost-shifting is occurring from the Express Scripts program and not the Medicaid program, even in the presence of reimbursement below costs for Medicaid.

Finally, Stores 1 and 6 were analyzed because of the presence of net reimbursements greater than costs for all programs. The variables Acquisition Cost and Express Scripts were significantly correlated to cash price, while Montana Medicaid and Market Competition were not. One would expect to see the Express Scripts variable to become non-significant with the reimbursement above that of the all-payer price in both of these stores in the absence of cost-shifting. However, cost-shifting may still be occurring despite Express Scripts reimbursement being above the all-payer price, but conclusive evidence is lacking. Although one cannot conclude that cost-shifting is occurring at these stores, price discrimination may still be occurring.

Analyzing the mean weighted revenue per prescription was the final analysis performed. The average mean weighted revenue for all stores was $2.43 per prescription. Excluding Stores 3 and 6 from the analysis did not appreciably change the mean and standard deviation. Therefore, no bias appeared to be introduced by contacting the respective pharmacies a second time. In addition, the mean reduction in store revenue was
$1.55 per prescription by serving third-party patients. As independent pharmacies’ revenues decrease in the future, more stores’ reimbursement may fall below the all-payer-price, possibly leading to pharmacies closing and patients losing access to health care.

The tragedy is that patients covered by private third-party insurance are more likely the people most able to afford to pay for their medications. By shifting costs to those lacking prescription insurance (the elderly on Medicare and the uninsured not on Medicaid) a grave disservice is occurring. Those without prescription insurance should not be made to subsidize discounted prescriptions for insured patients.

In all fairness to the Express Scripts third-party program, it was chosen by convenience as it serves the employees of the University of Montana. For this study it was considered to be representative of all third-party plans.
CONCLUSION

Are third-party prescription programs being subsidized by cash paying patients in Montana? The above analysis compares the reimbursements of cash paying, Medicaid and Express Scripts for the same prescriptions among a sample of Montana Independent Pharmacies. The reimbursement rates among these payment mechanisms are significantly different from one another \( F = 90.1, df = 2, p < 0.001 \). Cost-shifting was identified in this small sample of rural Montana Independent Pharmacies where prescriptions were dispensed to Express Scripts patients. Cash-paying patients absorbed the shift to subsidize Express Scripts patients’ discounts.

With third-party reimbursement rates below pharmacies’ costs of dispensing a prescription, pharmacies have two choices. First, they can shift the losses to their cash-paying customers. Second, they can absorb the losses on third-party prescriptions dispensed and risk going out of business. As seen in the above pharmacies, all accept different reimbursement rates for the same prescriptions. Four of the six pharmacies apparently cost-shift to try and recover the revenue lost by servicing Express Scripts, one of many third-party prescription coverage programs.

When the data were combined for analysis, a general cost shift to the cash-paying patient seemed to be occurring in the amount of $0.90 per prescription. As attributed specifically to the Express Scripts program, $0.05 per prescription was shifted to the cash paying patient due to the low volume of Express Scripts patients served by study pharmacies.
Future research should include increasing the sample size of the number of prescriptions in each store being analyzed. In addition, more third-party programs should be evaluated.

Pharmacists and pharmacies (independent as well as chain) should carefully evaluate a third-party contract before entering into an agreement. A careful analysis of each program’s reimbursement rate, assuring that it is above the store’s price of dispensing a prescription will save the pharmacy’s cash-paying customers the burden of subsidizing discounts for third-party patients.
Appendix 1:
Calculating the Cost of Dispensing a Prescription
(Based on article by DC Huffman, NARD Journal. 1990(Feb); 20-24.)

Obtain the information needed below from your financial statements for your most recently completed fiscal year. Please read through this entire worksheet before filling in data.

Personnel expenses for one year

A. Pharmacy Manager*
Salary $________(1)
Benefits $________(2)

Total compensation charged to prescription department (Add Line 1 and Line 2) $________(3)

Estimate average percentage of manager’s time spent managing prescription department (as opposed to managing other departments in your store) _______%(4)

Total manager expense (Line 3 X Line 4) $________(5)

*If you do not utilize a manager, count yourself as the pharmacist manager, and estimate a reasonable salary and benefits amount you would be paid.

B. Pharmacists, clerks, technicians, interns
Salaries $________(6)
Benefits $________(7)

Total compensation (Add Line 6 and Line 7) $________(8)

Estimate average percentage of employees’ time spent working in the prescription department (as opposed to working in other departments in your store) _______%(9)

Total pharmacy department employee expense (Line 8 X Line 9) $________(10)

Delivery person
Salary $________(11)
Benefits $________(12)

Total compensation (Add Line 11 and Line 12) $________(13)
Estimate average percentage of delivery person’s time spent in delivery function (as opposed to completing other duties in your store) $
$
Estimate % of deliveries which contain at least one prescription $
$
Total delivery person expense (Line 13 X Line 14 X Line 15) $
$
Custodial services
Salary $________(17)
Benefits $________(18)
Total compensation (Add Line 11 and Line 12) $________(19)
Estimate average percentage of time spent in janitoring function (as opposed to completing other duties in your store) _______%(20)
Enter approximate floor area of prescription department _______sq. ft. (21)
Enter approximate floor area of entire store _______sq. ft. (22)
Divide Line 21 by Line 22, multiply by 100% _______%(23)
Total janitorial expense (Line 19 X Line 20 X Line 23) $________(24)
TOTAL PERSONNEL EXPENSES (Add Lines 5, 10, 16, 24) $________(24a)

Prescription Department Operating Expenses

Prescription filling expenses
Prescription containers, labels, bags $________(25)
Value of computer(s) dedicated to prescription department $________(26)
Other prescription filling expenses (Specify:____________________) $________(27)

TOTAL PRESCRIPTION FILLING EXPENSES $________(28)

Professional expenses
Pharmacist/Technician license/registration fees paid by business $________(29)
Pharmacy association dues paid by business $________(30)
Professional journal subscriptions paid for by business $________(31)
Fee for pharmacy permit (1 year) $________(32)
DEA license fee (1 year) $\_\_\_\_\_\_ (33)
Professional books used in pharmacy $\_\_\_\_\_\_ (34)
Other professional expenses
   (Specify: __________________________) $\_\_\_\_\_\_ (35)

TOTAL PROFESSIONAL EXPENSES $\_\_\_\_\_\_ (35a)

Travel to professional meetings (for CE programs) $\_\_\_\_\_\_ (36)

D. Dedicated prescription department telephone(s) ("MDs’ line") $\_\_\_\_\_\_ (37)

Non-salary delivery expenses
   Vehicle depreciation or reimbursement to employee $\_\_\_\_\_\_ (38)
   Insurance $\_\_\_\_\_\_ (39)
   Fuel $\_\_\_\_\_\_ (40)
   Oil $\_\_\_\_\_\_ (41)
   Repairs $\_\_\_\_\_\_ (42)
   Maintenance $\_\_\_\_\_\_ (43)
   Taxi/Courier service $\_\_\_\_\_\_ (44)
   Total vehicle expenses (Total Lines 38-44) $\_\_\_\_\_\_ (45)
   Estimated % of deliveries which contain at least one prescription (Line 15) $\_\_\_\_\_\_ (46)

TOTAL VEHICLE EXPENSES FOR PRESCRIPTION DELIVERY SERVICE (Line 45 X Line 46) $\_\_\_\_\_\_ (47)

Advertising for prescription department (products and services) $\_\_\_\_\_\_ (48)

Professional attire laundering and dry cleaning paid by store $\_\_\_\_\_\_ (49)

Shared expenses

   Total rent* $\_\_\_\_\_\_ (50)
   Utilities $\_\_\_\_\_\_ (51)
   Accounting fees $\_\_\_\_\_\_ (52)
   Legal fees $\_\_\_\_\_\_ (53)
   Taxes $\_\_\_\_\_\_ (54)
   Insurance $\_\_\_\_\_\_ (55)
   Interest payments $\_\_\_\_\_\_ (56)
   Miscellaneous expenses $\_\_\_\_\_\_ (57)
   Manager’s total compensation not allocated to prescription department. $\_\_\_\_\_\_ (58)
   Total expenses $\_\_\_\_\_\_ (59)
TOTAL SHARED EXPENSES CHARGED TO
PRESCRIPTION DEPARTMENT
(LINE 58 X LINE 23) $________(60)

*If you own the building, estimate what your monthly rent would have been.

III. Cost to Dispense an Rx

Add Lines 24a, 35a, 36, 37, 47, 48, 49, 60 $________(61)

For 3rd party prescription expenses

If you submit billings for third-party prescriptions by computer,
enter the transmittal fee for each 3rd party prescription $________(62)
processed

If you transmit prescription billings through more than one
carrier, and these carriers charge different transmittal
fees, calculate a weighted average transmittal fee:

For each carrier, multiply the transmittal fee charged per
prescription by the number of prescriptions processed by
that carrier

Total the amounts obtained in ‘a’ above for all carriers

Divide the number obtained in ‘b’ above by the total number
of all third party prescriptions transmitted. This will give you
the weighted average transmittal fee.

Multiply the number calculated from ‘c’ above by the number of
third party prescriptions you filled last year. Enter this number in
Line 62.

- OR -

If you do not submit claims by computer, multiply the number of third party prescriptions
you filled last year by $1.50. (Based upon a Purdue University study of the cost of hand-
processing a 3rd party prescription, adjusted for inflation.)
Enter this number in Line 62.

Enter the total number of prescriptions you filled last year. ______Rxs (63)

Calculate the cost of dispensing each prescription (Add Lines 61
and 62. Divide the sum by Line 63) $_______/Rx (64)
PHARMACY NAME: ________________________________

NAME OF PERSON COMPLETING CALCULATIONS: ________________________

Thanks very much for completing these calculations. Please forward a copy of this worksheet to Tim Stratton or Lori Morin, School of Pharmacy, The University of Montana, Missoula, MT 59812. This worksheet may be returned along with your first batch of cash prescription data sheets if you wish.
### Appendix 2:

**Cash Prescription Data Sheet**

**Pharmacy Name:**

<table>
<thead>
<tr>
<th>Script Number</th>
<th>.Is Drug Brand or Generic?</th>
<th>Drug Name and Strength</th>
<th>Drug Manufacturer</th>
<th>Quantity Dispensed</th>
<th>NDC Number</th>
<th>Package Size</th>
<th>Pharmacy Cost /pkg.</th>
<th>Price to Patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>✓ Brand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>✓ Brand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>✓ Brand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>✓ Brand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>✓ Brand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>✓ Brand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
REFERENCES


Duncan RP. Uncompensated Hospital Care. Medical Care Review. 1992 (Fall); 49 (3): 265-330.


Huffman DC. Calculating the Cost of Dispensing a Prescription. NARD Journal. 1990 (Feb); 20-4.


Rosko MD and Carpenter CE. Hospital Markups: Responses to Environmental Pressures in Pennsylvania. Hospital and Health Services Administration. 1994 (Spr); 39 (1): 3-17.