

**Evaluation of the  
Private Fee-for-Service  
(PFFS) Plans in the  
Medicare Plus Choice  
Program**

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**PATTERNS OF MARKET  
ENTRY AND  
ENROLLMENT FOR  
STERLING OPTION 1**

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# PATTERNS OF MARKET ENTRY AND ENROLLMENT FOR STERLING OPTION 1

## Executive Summary

Starting in July of 2000, the Sterling Life Insurance Company of Bellingham, Washington, began to offer Medicare beneficiaries a new type of health plan – private fee-for-service (PFFS) – marketed in the form of a plan called “Sterling Option 1.” PFFS is a hybrid Medicare + Choice (M+C) option, in which a plan pays Medicare FFS rates to providers, even as it is reimbursed under the same capitation rates and risk adjustments that apply to other, risk-bearing M+C plans (almost entirely HMOs). PFFS plans are permitted to charge copayments that differ substantially from a Medigap plan or other M+C plan. Sterling Option 1 offers beneficiaries protection from some potentially large expenses (e.g., for hospital stays), but at a smaller premium than beneficiaries would pay for a supplementary policy with similar benefits.

The Centers for Medicare and Medicaid Services (CMS) contracted with Abt Associates Inc. to evaluate the PFFS plans, starting in October of 2001. Abt’s preliminary work on PFFS/Sterling Option 1 suggests that the profile of markets that Sterling has entered does not necessarily conform to Sterling’s stated strategy or to the expectations of various public officials as to the role PFFS might serve. Consequently, we have proposed to move beyond these public statements of intent or purpose, to analyze the characteristics of:

1. The areas where Sterling actually operates.
2. The enrollment experience in those areas.

That is the purpose of this report. We present below a two-stage analysis. The first step is to develop and estimate models of entry based on Sterling’s officially approved service area for 2001, regardless of actual enrollment. Sterling’s approved service area reflects Sterling’s strategic decisions and therefore should support some inferences about Sterling’s intent. The second step is to develop a statistical model of aggregate enrollment conditional on entry, something that can be due to many factors, only some of which are controlled by Sterling.

Employing county-level data from a number of sources, our results can be conveniently divided into thematic sections and summarized as follows:

### **Payment Rate and Unit Cost Effects**

- Sterling was substantially more likely to enter counties subject to the urban and rural payment floors of \$525 and \$475. These floors, however, did not significantly affect enrollment.
- Sterling was less likely to enter counties with high average PIP-DCG risk scores. Again, enrollment was not affected.

- Sterling was most likely to enter rural counties, followed by adjacent, then urban ones. However, Sterling's enrollment came most heavily from urban counties, followed by adjacent, then rural ones.
- Sterling was more likely to enter counties with relatively high proportions of elderly persons. Enrollment rates, however, were significantly *lower* in these counties.
- Sterling was less likely to enter counties with relatively high-income residents. But there was no significant relationship between enrollment and per capita income.
- The availability of Medigap products from Sterling's parent company was not significant with respect to Sterling entry but appeared to have important, positive effects on Sterling enrollment.
- Sterling was more likely to enter counties with higher 1999 average FFS costs (holding payment rates and other variables constant in a multivariate model).<sup>1</sup> This is an unexpected and substantial result. The effect on enrollment was also positive and significant.

### **Potential Demand and Selection Effects of Competition**

- Sterling was less likely to enter counties with relatively high average premiums for Medigap Plan C or comparable products. By contrast, Sterling experienced significantly more enrollment in these counties.
- Sterling was more likely to enter counties experiencing net declines in the number of MCOs serving their market. Sterling also attracted a disproportionate number of enrollees from these counties.
- Sterling was more likely to enter counties with relatively high rates of market penetration by M+C plans; however, enrollment was not significantly affected.
- Sterling was less likely to enter counties with larger numbers of HMOs, and enrollment was also significantly lower in these counties.

### **Other Demand and Selection Effects**

Sterling was less likely to enter counties in states with Medigap guaranteed issue laws for disabled Medicare beneficiaries; however, there was no significant effect on enrollment from these counties. Since we hypothesized that guaranteed issue laws would improve Sterling's expected risk selection, this result was unexpected. One possible explanation is that states with Medigap guaranteed issue laws are also more likely to have imposed other insurance regulations that Sterling executives have judged to be too restrictive.

These results suggest a number of hypotheses for further investigation:

- *Sterling attempted to take advantage of payment incentives established by BBA and subsequent legislation to encourage entry into underserved areas.*

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<sup>1</sup> Since payment rates have historically been based on average per capita FFS cost, one might expect 1999 FFS costs and 2001 payment rates to be closely correlated, potentially causing a collinearity problem in the multivariate models and producing this unexpected result. This is not the case, however, since payment rates are no longer closely based on per capita cost. The correlation coefficient for these two variables was only 0.63.

- *Sterling attempted to minimize costs by avoiding counties with high average PIP-DCG risk scores and by targeting counties with high concentrations of potential customers or with an existing Sterling infrastructure for sales and service.*
- *Sterling sought out markets where incumbent plans might be exploiting market power, making low-risk beneficiaries potentially receptive to new products.*
- *Sterling sought out markets with relatively low regulatory scrutiny and relatively high provider acceptance of nontraditional payors.*
- *Sterling enrollees were motivated by relatively high Medigap premiums and reductions in the availability of HMO coverage brought about by M+C plan withdrawals.*

Although each of these hypotheses is supported by quantitative evidence presented in this report, strong conclusions need not be drawn at this point. As our evaluation proceeds, we will apply these hypotheses, as well as others to be developed, to guide our interviews, analyses of survey results, and analyses of administrative databases (including claims and encounter data), ultimately leading to more definitive conclusions.

# 1 Introduction and Background

Starting in July of 2000, the Sterling Life Insurance Company of Bellingham, Washington, began to offer Medicare beneficiaries a new type of health plan – private fee-for-service (PFFS) – marketed in the form of a plan called “Sterling Option 1.” PFFS is a hybrid Medicare + Choice (M+C) option, in which a plan pays Medicare FFS rates to providers, even as it is reimbursed under the same capitation rates and risk adjustments that apply to other, risk-bearing M+C plans (almost entirely HMOs). PFFS plans are permitted to charge copayments that differ substantially from a Medigap plan or other M+C plan. Sterling Option 1 offers beneficiaries protection from some potentially large expenses (e.g., for hospital stays), but at a smaller premium than beneficiaries would pay for a supplementary policy with similar benefits.

PFFS is a potentially important innovation in Medicare. In one view, it is a prototype for the privatized administration of Medicare fee-for-service. More modestly, it may represent a welcome middle option in the market for Medicare supplements. In any event, it will be important to determine whether the Sterling PFFS product is a good deal for the Medicare program and Medicare beneficiaries, and on what basis. The Abt Associates evaluation of PFFS will undertake a series of analytic efforts to answer these questions, including analyses of beneficiary impacts and satisfaction, enrollment, utilization, and cost. This report is the first study in that sequence of analytic efforts, asking what can rightly be seen as a first-order question about the Sterling PFFS: *where has Sterling chosen to offer it?* Has Sterling entered a diverse set of Medicare markets? Or does Sterling appear to target particular kinds of areas – e.g., does Sterling focus on areas that present low competition? Or does Sterling appear to respond to incentives built into the reimbursement system, entering only those select markets where administrative methods (as modified in important ways by Congress) have disproportionately increased payment levels? And how have beneficiaries responded?

Abt’s preliminary work on PFFS/Sterling Option 1<sup>2</sup> suggests that the profile of markets entered does not necessarily conform to Sterling’s stated strategy or to the expectations of various public officials as to the role PFFS might serve. Consequently, we have proposed to move beyond these public statements of intent or purpose, to analyze the characteristics of:

1. The areas where Sterling actually operates.
2. The enrollment experience in those areas.

That is the purpose of this report. We present below a two-stage analysis. The first step is to develop and estimate models of entry based on Sterling’s officially approved service area for 2001, regardless of actual enrollment. Sterling’s approved service area

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<sup>2</sup> Some of this work is summarized in our original technical proposal. See Abt Associates, “Evaluation of Private Fee for Service Plans in the Medicare Plus Choice Program: Technical Proposal,” submitted to pursuant to CMS RFP No. 500-00-0032, Task Order 2 (May 24, 2001), Chapter 1.

reflects Sterling's strategic decisions and therefore should support some inferences about Sterling's intent. The second step is to develop a statistical model of aggregate enrollment conditional on entry. Of course, enrollment levels reflect many factors, such as M+C exits, on which Sterling may or may not be explicitly attempting to capitalize. We cannot necessarily infer Sterling's intent from enrollment patterns, but this is not necessary at this point in the evaluation. Our goal is to determine the actual county-level patterns of Sterling entry behavior and enrollment, however those patterns are brought about.

This is one of two reports we are preparing on PFFS enrollment. In this report, we use county-level data to investigate entry and enrollment questions. In a second report (Abt Associates, 2002), we use individual-level data to examine the composition of enrollment in greater detail. Together, these two reports will give us a fairly detailed understanding of PFFS entry and enrollment. We will use the results to guide our work on other analyses, and we will compare the implications of other results to the implications of these analyses.<sup>3</sup> That will permit us, in our intermediate and final reports, to reach conclusions about the significance of what we observe in Sterling's entry behavior.

The report is divided into five sections. We begin in Section 2 with an overview of the incentives Sterling likely faces in making its market choices. These incentives give rise to hypotheses about the patterns of enrollment we might observe. Section 3 describes our data and methods for exploring Sterling entry behavior and enrollment. Section 4 presents our results and Section 5 provides a brief discussion.

## **2 Incentives to Select Particular Markets**

A first step in studying Sterling's entry decisions is to develop a conceptual model of how the entry decision might be made. This can be done both by appealing to economic theory and by reviewing the literature on related subjects. Because PFFS is a new form of insurance under the M+C program, there is no existing body of literature identifying factors that may influence the decision of PFFS plans to enter a particular market. However, there is substantial literature addressing the recent entry and exit behavior by HMO-type plans in the Medicare program. The findings of these studies are complex, but they do suggest some straightforward expectations. Table 1.1 below summarizes the most important of these analyses.

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<sup>3</sup> For example, in the Sterling case study, we will explore Sterling's professed goals in selecting areas of entry and seek to learn what we can about the business strategy that lies behind these decisions.

**Table 1.1  
Summary of Studies on How MCOs Choose to Enter the Medicare Market**

<b>Authors</b>	<b>Main data sources</b>	<b>Methods and variables</b>	<b>Main findings and conclusions</b>
<b>Adamache and Rossiter (1986)</b>	Interstudy's 1982 National HMO Census; Office of HMO's 1982-1983 report to Congress	Maximum likelihood probit specification  Independent variables included: market characteristics, prior experience with Medicare, organizational characteristics, service use experience, financial condition	HMO's decision to enter National Medicare Competition (risk-based contracts) most affected by: <ul style="list-style-type: none"> <li>• AAPCC rate: an increase of one standard deviation (\$50) above the mean increased the probability of market entry by 16%</li> <li>• Prior experience serving Medicare beneficiaries</li> <li>• Federal qualification.</li> </ul>
<b>Porell and Wallack (1990)</b>	Interstudy's 1985 HMO Summary; Interstudy's 1984 National HMO Census	Binary logit model  Independent variables included: organizational attributes, market attributes, competitive market structure/position, performance attributes	Market entry into TEFRA risk contracts most strongly associated with: <ul style="list-style-type: none"> <li>• AAPCC (an increase of one standard deviation increased probability of entry by 70%)</li> <li>• Prior experience serving Medicare beneficiaries (cost contracts)</li> <li>• Federal qualification</li> </ul> AAPCC not as important for market entry as in 1986.
<b>Pai and Clement (1999)</b>	Interstudy's 1994 and 1995 HMO Directories	Logistic regression  Independent variables included: Attractiveness of market, market area attributes, organizational attributes	New market entry of HMOs into Medicare risk program associated with: <ul style="list-style-type: none"> <li>• Large commercial enrollments</li> <li>• Size of HMO</li> <li>• Federal qualification</li> <li>• And only weakly associated with AAPCC (an increase of one standard deviation increased the probability of entry by 2.3%)</li> </ul> HMO size was a stronger predictor of market entry than AAPCC rate.
<b>White and Doksum (2001)</b>	HCFA Quarterly State/ County/ Plan Data Files for 1993-2000	Logistic regression  Independent variables included: health resources, M+C presence, urbanicity, region, PIP-DCG risk score, other population characteristics	Entry of HMOs into counties was: <ul style="list-style-type: none"> <li>• Strongly associated with payment rate, although relationship declined over time and was insignificant in the late 1990s after BBA payment changes</li> <li>• Significantly related to region and urbanicity, although the regional relationship declined over time</li> <li>• Weakly and negatively associated with measures of other M+C competition</li> </ul> Organizational characteristics were not associated with entry.

SOURCE: Adapted from White et al. (2001).

These findings from HMO-style plans may or may not be pertinent to PFFS behavior, since the organization and economics of PFFS are different in important ways from M+C plans. To take one example, the fixed administrative costs for each additional county can be substantial for HMO-style M+C plans (e.g., given the costs of building and maintaining a provider network), but can be relatively trivial for PFFS plans. We thus should be cautious in taking the findings on entry behavior by HMOs as likely hypotheses for PFFS. But these findings do at least give us some areas to consider for Sterling entry behavior:

- Payment rate
- The presence of other M+C plans and other competition
- Urbanicity (measures of how urban or rural a county is)



- Organizational characteristics of the plans (size, federal qualification, size of commercial enrollments).

A theoretical approach to the question of entry suggests some of the same areas, as well as some additional ones.<sup>4</sup> If we assume that Sterling will enter a market if it is profitable to do so, we can write down a simple model that predicts entry under the following conditions:

$$(1) \quad E(\Pi) = E\{(R + P)Q - CQ\} > 0$$

where  $\Pi$  denotes profit,  $R$  represents the payment rate,  $P$  is the premium,  $C$  denotes average cost,  $Q$  is the number of enrollees, and  $E(.)$  is the expectations operator. Since we know that Sterling sets a national premium, and then decides which counties to enter (at least in the first year), we can take  $P$  to be fixed for the purposes of the entry decision. Bringing the expectations operator through the right-hand side gives

$$E(\Pi) = (R + P)E(Q) - E(CQ) > 0,$$

which can be further refined using the definition of covariance<sup>5</sup>

$$E(\Pi) = (R + P)E(Q) - E(C)E(Q) - \text{cov}(CQ) > 0.$$

Dividing through by  $E(Q)$  implies that entry will occur if Equation (2) is satisfied.

$$(2) \quad (R + P) - E(C) - \text{cov}(CQ)/E(Q) > 0$$

Although we do not know with certainty that the covariance between  $C$  and  $Q$  is positive, we believe that this is so because beneficiaries who live in high-cost areas are exposed to higher potential losses and therefore benefit more from insurance. This implies that Sterling may have two reasons to avoid high-cost counties: first, because the margin between revenue and cost is compressed, and, second, because demand for these low-margin products could be high.

In addition to the terms explicitly expressed in Equation (2), Sterling may also be concerned about other factors that could affect its expected level of average cost, relative to the overall average cost in the market. Because different beneficiaries have different expected utilization, the average cost that Sterling will experience in a market will be strongly affected by the utilization patterns of the particular beneficiaries who enroll. If Sterling enrolls individuals with higher than average utilization, this is known as adverse selection. If utilization is lower than the average in the market, selection is said to be favorable.

In sum, in addition to the **payment rate**, factors that might affect the expected value of average cost,  $E(C)$ , and the expected level of demand,  $E(Q)$ , belong in our model. For

<sup>4</sup> The authors are indebted to Roger Feldman for helpful advice on this section.

<sup>5</sup> In this case,  $\text{cov}(CQ) = E\{(C-E(C))(Q-E(Q))\}$ , which can be rewritten:  $\text{cov}(CQ) = \{E(CQ) - E(C)E(Q)\}$ .

expositional convenience, these factors can be separated into two basic types, those that primarily affect the cost of providing particular services (**unit cost factors**), and those that primarily affect the level of demand and the expected relative utilization intensity of enrollees (**demand and selection factors**). In what follows, we provide some background and discussion of each of these groups of factors, beginning with the payment rate.

## **2.1 Payment rate and the effects of Congressional price-setting for M+C**

The Medicare + Choice program (M+C) currently provides health insurance coverage to 5 million Medicare beneficiaries through privately operated managed care plans (CMS, 2002). In exchange for accepting some limits on utilization and choice of provider,<sup>6</sup> M+C enrollees historically have received more extensive coverage than they would under traditional fee-for-service Medicare. Payments by the Centers for Medicare and Medicaid Services (CMS) to health plans have been set by administrative pricing methods, whereby the government performs certain calculations and then, based on those calculations, announces how much it will pay for managed care coverage in each county nationwide. Historically, government payments in some areas were sufficiently high that health plans could offer drug and other coverage at little or no added cost to Medicare enrollees, while in other areas enrollees had to pay an added premium for coverage offering little beyond the Medicare entitlement.

Until 1997, the monthly payment for risk bearing plans was tied directly to the cost of the entitlement benefit package in FFS Medicare in the beneficiary's county. The Balanced Budget Act of 1997 (BBA 1997) altered the direct link between FFS costs and payment to M+C plans. High- and low-payment areas were to be compressed over time toward the national average, and “floor” payments were established for low-payment areas. However, while year-to-year increase factors were now based on methods set forth in BBA 1997, rather than FFS costs *per se*, the base payment amounts to which these factors applied still largely reflected patterns of historic FFS costs. Subsequent legislation further attenuated the linkage between M+C reimbursement and area FFS costs, especially for lower paid areas. The 1999 Balanced Budget Refinement Act (BBRA 1999) provided for special payment increases (“bonuses”) for M+C plans entering underserved, largely rural areas. A year later, the Benefits Improvement and Protection Act of 2000 (BIPA 2000) changed the minimum payment method of BBA 1997, by creating a new “urban” minimum payment of \$525, increasing the payment floor for all other areas to \$475, and creating a new year-to-year adjustment method for these floor payments. BIPA 2000 also raised the minimum annual increase in payment rates to 3 percent for 2001.

The net effect of all these adjustments has been to change the counties in which M+C payments are “generous,” in relation to underlying costs of service. Highly paid urban counties, circa mid-1990s, have been squeezed, to the point that plans have exited some areas

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<sup>6</sup> These limits are decreasing under market pressures, to the point that some M+C plan executives consider their HMO-style coverage to be tantamount to PPO coverage in the commercial sector. See Coulam and Dowd (2002).

(see Section 2.1.2), benefit enhancements have been cut back, and the proportion of counties with HMO options at zero premium has dramatically declined: from 62% in 1999 to 15% in January of 2001 (Pizer and Frakt, 2002). Meanwhile, M+C payments in floor counties frequently exceed the average FFS cost of those counties, as discussed later (see Section 4.1).

The overall picture is rather complex, but it can at least be said that Congressional initiatives have created new incentives for market entry in floor counties, while only slightly attenuating the BBA “price squeeze” in highly paid urban counties.

## **2.2 Unit cost factors: historical cost, spillovers, and urban/rural status**

The most fundamental observation about expected PFFS cost is that fee-for-service costs have varied substantially in the past across markets, and the pattern of differences across counties has been relatively persistent—that is, counties that had high per capita FFS cost in the past are likely to have high costs in the future as well (Gornick, 1982).

Historical FFS cost, however, is an imperfect measure of expected future PFFS cost, so it is worthwhile to consider other variables that might add information to our model. First among these is whether other M+C plans in the market are charging a premium. This variable reflects the cost forecasts of other M+C plans, relative to the payment rate in the county, and consequently is more forward-looking than historical FFS cost. Of course, because of the difference in organizational form, PFFS costs are likely to differ from HMO costs in important ways, but this variable may still be valuable.

Several other factors related to HMO costs are suggested by the literature. Because PFFS plans could benefit from lower prices negotiated by HMOs, variables that potentially affect HMO bargaining power ought to be considered. Bargaining power is thought to vary with the number of physicians per capita (Wholey et al., 1993) and urban/adjacent/rural status (McBride, 1998). HMOs should have stronger bargaining positions in relatively urban counties with high numbers of physicians per capita because under these circumstances it is easier for plans to direct beneficiaries to preferred providers (because there are more providers to choose from and traveling distance is minimal).

A strong finding of the previous research is that entry into urban and rural areas is different – for example, in many years, influences like payment rate can help explain entry into urban areas and areas immediately adjacent to urban areas, but payment differences cannot explain the differences in entry probabilities *between* rural and urban areas. For M+C plans in the past, rural areas presented small populations, difficulties in developing provider networks, high start-up costs, and other problems that appeared to make the question of entry into rural areas different than for urban or adjacent areas.

PFFS may not follow that same pattern, however. At least in its Sterling Option 1 variant, PFFS does not require many of the components of HMO-based plans – e.g., the creation of a contracted network of providers. PFFS might be better able to take beneficiaries and providers where they are, without notably different incentives between rural

and urban areas, except as the standard Medicare FFS prices might create such incentives. These differences in the organization and economics of PFFS might give PFFS a different relation to rural areas than has been typical for other M+C plans.

Plans' marginal costs should also vary with the capital intensity of area health systems, measured in our models by the per capita number of hospital beds in the county. Higher numbers of hospital beds per capita are thought to be associated with higher marginal costs because of the cost of maintaining additional beds (Gaynor and Anderson, 1995) and potentially as a reflection of regional practice patterns (Knickman and Foltz, 1985). Practice patterns may also be reflected in the effects of PIP-DCG risk scores in our model because these risk scores rely on inpatient diagnoses and our specifications included historical FFS costs per capita. Thus, when comparing two counties with the same risk scores but different historical costs, the county with higher historical costs probably has a practice pattern that relies less heavily on inpatient hospitalizations. Although this differs from the most common interpretation of the PIP-DCG risk score as a measure of average health status at the county level, it is appropriate in a model that also contains per capita FFS spending.

Another component of Sterling's expected cost arises from marketing and customer service expenses. As with any insurance product, a substantial part of the cost of production is associated with these functions. In the case of Sterling Option 1, we hypothesize that these costs might be lower in counties where Sterling's parent company, the Combined Insurance Company of America, already sells (or now chooses to sell) Medigap insurance. Economies of scope might be achievable by exploiting networks of agents and claims processing arrangements, especially where these networks already exist. Similarly, counties with relatively high populations or high proportions of residents over age 65 provide opportunities to reach more potential customers with a given marketing effort.

Finally, per capita income might be a factor in Sterling's marketing decisions because higher income individuals are more likely to have employer-sponsored supplemental insurance, obviating the need for Sterling's product (Rice and Bernstein, 1999). Hence, holding other factors constant, we hypothesize that Sterling will target its marketing resources to avoid high-income areas.

### ***2.3 Demand and selection factors: Medigap and the effects of exiting M+C plans***

In considering whether to enter a particular market, theory suggests that Sterling will attempt to forecast the degree of adverse or favorable selection that it will experience; in other words, will it attract the relatively sick or the relatively healthy? A critical set of factors influencing this forecast will be variables that reflect the presence and behavior of other insurance plans in the market. In general these variables help to characterize the intensity of competition over low-risk beneficiaries—if competition is intense, Sterling can expect to experience more adverse selection than otherwise. In thinking about PFFS entry, we can imagine at least two important dimensions of competition: competition with HMO-based M+C plans, and competition with Medicare FFS plus Medigap supplements.

HMO-based M+C plans. In 2000, under the continuing cost pressures wrought by BBA payment methods and subsequent refinements, the M+C program began to experience profound changes. Plans began to withdraw from a substantial number of markets, leaving enrollees to search for coverage elsewhere. In January 2001, over 150,000 Medicare beneficiaries previously enrolled in M+C were left with no M+C plans doing business in their counties (HCFA, 2000). In other areas, beneficiaries were left with fewer M+C options. In addition to these market withdrawals, plans began to increase premiums and reduce benefits in their remaining markets (Gold, 2001; and Pizer and Frakt, 2002). Throughout this period, plans argued that changes in payment rates brought about by the BBA combined with rapidly increasing costs to make these decisions unavoidable (AAHP, 2000; Fried and Zeigler, 2000; see also Coulam and Dowd, 2002).

One possibility is that we will find Sterling Option 1 mirrors the results for HMO-based M+C plans – i.e., that PFFS tends to avoid the same markets that other M+C plans are leaving. A second possibility is that (1) PFFS is different from HMO-based M+C in ways that mitigate the reasons for avoiding particular counties, and (2) the turmoil for other M+C plans – the exits – are a competitive opportunity for PFFS. Specifically, the exit of M+C plans creates groups of beneficiaries who have to make a new plan choice, and reduces the level of competition for them. These beneficiaries are likely to be especially attractive in orphan counties, in which the only competition for the orphaned beneficiaries is conventional FFS, or conventional FFS plus a supplement.

FFS plus Medigap supplements. If Medigap supplements are cheap, then it will be more difficult to sell Sterling Option 1 – which is, in effect, a bare-bones supplement. Why would a beneficiary purchase Sterling Option 1 if more comprehensive supplements were inexpensive?

As it happens, however, Medigap supplements have been expensive and their costs have been rising steeply. From 1994 through 1998, the average price of Plan C (the most commonly purchased plan in 1998 and the plan that most closely parallels Sterling Option 1) increased an estimated 44 percent (Consumer Reports, 1998; Rice and Bernstein, 1999). Indeed, according to an Abt Associates study (Gaumer, 2001), this steep rise is one of the key reasons that SHIP counselors, at least, have been recommending Sterling to beneficiaries. Sterling Option 1 is a fixed benefit across all the different counties in which Sterling offers it. The relative price of the most competitive Medigap policies will vary in relation to the fixed Sterling Option 1 price. That variation should define some of the significant competitive space for Sterling.

Beyond the cost of Medigap coverage, the regulatory environment governing Medigap availability might also affect the decisions of potential Sterling enrollees. In particular, we hypothesize that Sterling might prefer states with laws that guarantee issue of Medigap policies to disabled Medicare beneficiaries. This might be the case because the disabled are more costly to insure than the typical beneficiary, and if they have limited access to Medigap products then they may be more likely to enroll in Sterling, as one of their only alternatives.

The above discussion of unit cost and selection factors is summarized for convenience in the table below.

**Table 2.1  
Unit Cost and Selection Factors in PFFS**

Unit Cost Factors	Demand and Selection Factors
Historical per capita cost	Intensity of competition from alternatives
MCO premium	- MCO industry concentration
Physicians per capita	- MCO market penetration
Urban/rural status	- Medigap premium level
Hospital beds per capita	- Number of MCOs in market
Sterling Medigap presence	- Change in number of MCOs
Per capita income	Medigap guaranteed issue for disabled
Number of Medicare beneficiaries	
Proportion of population over age 65	

Note that some variables are likely to affect forecasts of both unit costs and selection. We have assigned each factor to one category for convenience.

## 2.4 Statistical specification

*Entry:* To estimate the relative importance of each of the factors discussed above in determining Sterling's entry behavior, Equation (2) can be adapted as follows (dropping P because the premium is a constant across counties):

$$(3) \quad Y^* = F(R, E(C), E(Q))$$

$Y^* > 0$  implies entry

$$E(C) = C(\text{unit cost factors, demand and selection factors})$$

$$E(Q) = Q(\text{demand and selection factors})$$

where  $Y^*$  is a latent variable (i.e., not directly observed) and – as above, R represents the payment rate, C denotes average cost, Q is the number of enrollees, and  $E(\cdot)$  is the expectations operator. Equation (3) can be estimated by probit methods.

*Enrollment:* We are interested in the factors that are related to enrollment in Sterling, conditional on Sterling entry. To investigate these, Equation (3) can be restricted to counties in Sterling's service area and rearranged such that the dependent variable measures enrollment.

$$(4) \quad Q^* = Q(R, E(C))$$

$Q^* > 0$  implies enrollment  $> 0$

$$(5) \quad Q = Q(R, E(C))$$

Equation (4) models the probability of nonzero enrollment and Equation (5) models the determinants of actual enrollment (the absolute number of enrollees), provided it is nonzero. Equations (4) and (5) can be estimated jointly by tobit methods.

## 3 Data

To measure benefits offered by risk plans, we obtained data from CMS' Medicare Compare database. To measure urban/rural status, payment rates, and other county characteristics that might be associated with cost of coverage, we combined data from several sources, including the 2000 Area Resource File (ARF), CMS' State/County/Plan Files, and county-level average Principal In-Patient Diagnostic Cost Groups (PIP-DCG) risk scores calculated by CMS. In addition, we extracted premium data for Medigap Plan C and comparable products from CMS' Medigap Premium Database. In this section we discuss data sources further and provide details on the construction of the analytic dataset.

### 3.1 Medicare Compare

We obtained M+C data on plan benefits and premiums for March 2001 (post BIPA) from CMS' Medicare Compare web site (<http://www.medicare.gov/mphCompare/home.asp>). These data contain information on M+C plan characteristics and benefits. A given plan may be associated with several alternative packages of benefits. Since our enrollment data, to be discussed below, are at the plan level (not the benefit package level), we chose the package that we thought most likely to attract the most enrollees for each plan. For plans with multiple packages, this was defined to be the one with the lowest premium. In the case of ties (i.e., several packages with the lowest premium), we selected the package with the most generous prescription drug benefits.

### 3.2 Service Area Files

The December 2001 M+C Service Area File was obtained from CMS' website. This file contains Social Security Administration (SSA) state and county codes identifying all of the counties for which each plan is approved to do business. These data describe Sterling's service area as of December 2001, although this official service area has changed only slightly since September 2000.<sup>7</sup> Given this fact, our analysis will mostly reflect Sterling entry decisions after a brief implementation period and no operational experience (Sterling became operational in July 2000, while service area decisions for 2001 had to be declared that same month). These data thus suggest Sterling's initial conception of desirable counties to enter.<sup>8</sup>

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<sup>7</sup> According to CMS' Service Area Files, Sterling's service area did not change between September 2000 and July 2001. Between July 2001 and December 2001, Sterling added one county in South Dakota, nine counties in Alaska, and all of the state of Montana. In the same period, Sterling exited nine counties in Texas and all of the state of Mississippi.

<sup>8</sup> Later this spring, Abt Associates will do a brief update of Sterling service areas for 2002.

### **3.3 State/County/Plan Files**

CMS' Quarterly State/County/Plan Data Files (<http://www.hcfa.gov/medicare/mpscpt1.htm>) report the number of enrollees by county for each managed care plan.<sup>9</sup> In addition they report the number of beneficiaries and payment rate by county. These payment rates are base rates, prior to any risk adjustment. Our data are for enrollments as of December 2001. These data thus describe Sterling enrollments after a little over one year of operational experience, time enough to capture most of the substantial expansion in enrollment that occurred in 2001, as described later.

### **3.4 Area Resource File**

The 2000 Area Resource File (ARF, <http://www.arfsys.com/>) contains county-specific health resources information and factors that may reflect health status and health care in the U.S. It contains more than 7,000 variables for each of the nation's counties. ARF contains information on health facilities, health professions, resource scarcity, health status, economic activity, health training programs, and socioeconomic and environmental characteristics. In addition, the file contains geographic codes and descriptors, which enable it to be linked to many other files and to aggregate counties into various geographic groupings. The ARF System is comprised of data from over 50 different source files and results from processing millions of micro data records (e.g., mortality and natality records from the National Center for Health Statistics). All information contained on the file is derived from secondary data sources.

### **3.5 Average PIP-DCG Risk Scores**

PIP-DCG risk scores measure a Medicare beneficiary's health status based on factors for age, sex, Medicare eligibility, prior disability, and diagnoses derived from recent inpatient hospital admissions. Beginning in 2000, these risk scores are being used to adjust M+C payment rates. Through a transition period, effectively extended by Congress in the BBRA, actual payments to M+C plans are risk adjusted through a blend of PIP-DCG factors and the ratebook demographic factors. We obtained county average PIP-DCG risk scores calculated by CMS for use in developing 2003 M+C payment rates from the M+C payment rate website (<http://www.hcfa.gov/stats/hmorates/aapccpg.htm>). Note that these scores are averages for all beneficiaries in each county, not just for M+C enrollees.

### **3.6 1999 Average FFS Cost**

County average per capita FFS costs for Part A and Part B from 1999 were downloaded from the CMS website (<http://www.hcfa.gov/stats/hmorates/aapccpg.htm>). Costs for disproportionate share hospitals, graduate medical education, and indirect medical education were excluded.

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<sup>9</sup> Prior to 1998, these files contained enrollment for every plan with one or more enrollees in a county. After 1998, the file includes enrollment only for plans with more than ten enrollees. For those with ten or fewer enrollees, the reported enrollment is coded as zero.



### 3.7 Medigap Data

Average premiums for Medigap Plan C by county were extracted from the Medigap Premium Database for Newly Issued Policies, for calendar year 2000, provided by CMS. Since Plan C is not offered in Massachusetts, Minnesota, and Wisconsin, comparable products were selected for those states.

### 3.8 Key Variable Definitions and Descriptive Statistics

Once data from all of the above sources were merged to form an analytic dataset, a series of variables were defined to correspond to the unit cost and selection factors discussed in Sections 2.1.2 and 2.1.3. This section provides details on the definitions of some of these variables and some basic descriptive statistics.

#### *Variable Definitions*

- **PFFS entry** was defined to have occurred if a county was listed as part of Sterling's service area in the December 2001 Service Area File, regardless of whether Sterling had any enrollees in that county. This definition yielded 1,609 counties.
- **PFFS enrollment** was extracted from the December 2001 State/County/Plan file. Since values less than 11 were set by CMS to zero in the original file, we imputed values of 3 for each county originally listed with a Sterling enrollment of zero in the State/County/Plan file. This resulted in 853 counties with nonzero enrollment and a total of 19,686 enrollees (which is closer to the total enrollment of 19,835 listed in the December Monthly Report).
- **2001 MCO market penetration** was defined to be the ratio of risk enrollees to total beneficiaries, by county, according to the December 2001 State/County/Plan file.
- **The M+C plan indicator and number of (non-PFFS) M+C plans** were calculated by counting the number of HMOs with 20 or more enrollees in each county, according to the December 2001 State/County/Plan file.<sup>10</sup> In addition to the number of plans, a binary variable indicating whether one or more M+C plans was present was included in the multivariate models to account for possible effects of bonus payments available in counties with no M+C plans.
- **The Herfindahl index** was calculated as the sum of the squared M+C HMO market shares in each county. Market shares were defined for M+C HMOs with 20 or more enrollees as the ratio of each enrollment to the sum of M+C HMO enrollment in the county. In counties with no HMO enrollment (i.e., no plans with 20 or more enrollees), the Herfindahl index was set to zero.
- **The change in the number of M+C plans** was calculated as the difference between the 2001 number of HMOs with 20 or more enrollees and the 2000 number, similarly defined.
- **The Sterling Medigap indicator** reflected the existence of a set of Medigap premiums for the Combined Insurance Company of America (Sterling's parent company) in the CMS Medigap Premium Database for 2000.
- **The average Medigap premium** was constructed as the simple average of premiums for males and females aged 65, 75, 85 and 95. Plan C premiums were selected for all

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<sup>10</sup> Because many counties have small numbers of beneficiaries whose official residence is outside the service area of their plan, a minimum of 20 enrollees was established to avoid counting these plans in these areas.

states where these values were available. For Massachusetts, Minnesota, and Wisconsin, coverage options were selected to approximate Plan C.

- **The M+C premium indicator and M+C premium amount** were derived from Medicare Compare data. When multiple products were listed under the same plan in Medicare Compare, the product with the lowest premium was matched to the plan number in our database. For the purposes of this variable, PFFS was not included.
- **2001 payment rate, 1999 FFS cost, and PIP-DCG risk score** were all taken directly from CMS databases.
- **Urban/adjacent/rural classifications,<sup>11</sup> physicians and hospital beds per 1000 persons, per capita income, and proportion of population over 65** were all constructed in a straightforward manner from ARF variables.

Descriptive statistics for these variables are shown in Table 3.1.

**Table 3.1  
Descriptive Statistics**

Variable	Valid Observations	Mean	Standard Deviation	Minimum	Maximum
PFFS entry indicator	3129	0.518	0.500	0	1
PFFS enrollment	3129	6.291	34.823	0	1237
2001 payment rate	3129	499.870	43.220	475.000	838.750
\$475 indicator	3129	0.583	0.493	0	1
\$525 indicator	3129	0.136	0.343	0	1
1999 FFS cost	3129	400.730	73.800	186.260	852.650
PIP-DCG risk score	3129	1.012	0.071	0.682	1.333
Urban indicator	3129	0.267	0.442	0	1
Adjacent indicator	3129	0.320	0.467	0	1
Physicians per 1000 persons	3127	1.323	1.398	0	21.489
Hospital beds per 1000 persons	3127	4.061	4.800	0	54.393
Per capita income in thousands	3127	19.751	4.694	3.961	68.686
Population proportion over 65 years old	3127	0.147	0.042	0.013	0.545
2001 MCO market penetration	3129	0.030	0.081	0.000	0.521
M+C premium indicator (y/n)	3129	0.189	0.391	0	1
M+C premium amount (\$)	3129	6.226	17.293	0	133
Number of other M+C plans > 0 (y/n)	3129	0.228	0.419	0	1
Number of other M+C plans	3129	0.506	1.303	0	22
Herfindahl index	3129	0.177	0.347	0	1
Change in number of M+C plans	3129	-0.237	0.715	-6	2
Sterling Medigap indicator	3115	0.654	0.476	0	1
Medigap open enrollment indicator	3115	0.409	0.492	0	1
Average Medigap premium (Plan C)	3115	132.220	12.818	100.800	209.440
Number of Medicare eligibles (in 000's)	3129	12.793	36.219	0.012	1024.662

Source: Abt Associates, 2002.

<sup>11</sup> Rural – urban continuum codes 0-3 were classified as urban; codes 4, 6, and 8 were classified as adjacent; and codes 5, 7, and 9 were classified as rural.

## 4 Results

We relied on our multivariate analysis (Section 4.2 below) to identify variables that had strong and significant effects on Sterling entry and enrollment. The descriptive tables and figures presented in Section 4.1 highlight those findings and permit a more intuitive exploration of each bivariate relationship. The descriptive findings are presented first because they are an accessible way to begin the discussion. Overall, the results of our county-level analysis of Sterling entry and enrollment can be conveniently divided into thematic sections and summarized as follows:

### **Payment Rate and Unit Cost Effects**

- Sterling was substantially more likely to *enter* counties subject to the urban and rural payment floors of \$525 and \$475 (by 14 and 13 percentage points, respectively<sup>12</sup>). These floors, however, did not significantly affect enrollment.
- Sterling was less likely to enter counties with high average PIP-DCG risk scores (12 percentage points less likely, given a 10-percentage-point increase in risk score). Again, enrollment was not affected.
- Sterling was most likely to enter rural counties, followed by adjacent, then urban ones (entry into urban counties was 18 percentage points less likely than into rural ones). However, Sterling's enrollment came most heavily from urban counties, followed by adjacent, then rural ones.
- Sterling was more likely to enter counties with relatively high proportions of elderly persons (6 points more likely given a 10-point increase in proportion over 65). Enrollment, however, was significantly *lower* in these counties.
- Sterling was less likely to enter counties with relatively high-income residents (2 points less likely for a \$1,000 increase in income). There was no significant relationship between enrollment and per capita income.
- The availability of Medigap products from Sterling's parent company was not significant with respect to Sterling entry but appeared to have important, positive effects on Sterling enrollment.
- Sterling was more likely to enter counties with higher 1999 average FFS cost. This is an unexpected and substantial result. A \$40 increase in FFS cost (10% of the mean) would have resulted in an 8-point increase in probability of entry. The effect on enrollment was also positive and significant.

### **Potential Demand and Selection Effects of Competition**

- Sterling was less likely to enter counties with relatively high average premiums for Medigap Plan C or comparable products (a \$13 increase in average Medigap premium was associated with a 9-point decrease in probability of entry). By contrast, Sterling experienced significantly more enrollment in these counties.

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<sup>12</sup> The marginal probability effects referenced in this summary can be found in the second column of Table 4.12.

- Sterling was more likely to enter counties experiencing net declines in the number of MCOs serving their market (on average, 4 points more likely per exit). Sterling also attracted a disproportionate number of enrollees from these counties.
- Sterling was more likely to enter counties with relatively high managed care market penetration (6 points more likely given a 10-point increase in penetration); however, enrollment was not significantly affected.
- Sterling was less likely to enter counties with larger numbers of HMOs (on average, 4 points less likely per HMO), and, again, there was no significant effect on enrollment.

#### **Other Demand and Selection Effects**

- Sterling was less likely to enter counties in states with Medigap guaranteed issue laws for disabled Medicare beneficiaries (16 points less likely); however, there was no significant effect on enrollment from these counties. Since we hypothesized that guaranteed issue laws would improve Sterling's expected risk selection, this result was unexpected. One possible explanation is that states with Medigap guaranteed issue laws are also more likely to have imposed other insurance regulations that Sterling might have judged to be too restrictive.

Except where noted, our results were consistent with expectations and suggest that Sterling responded to incentives built into the payment and regulatory system, reacted to variations in the intensity of competition in the marketplace, and took advantage of its existing sales and service infrastructure. We will discuss the implications of these results more fully in Section 5.

We conducted our study using simple bivariate tabulations as well as the more sophisticated statistical techniques outlined in Section 2. In what follows, we attempt to exploit the strengths of each technique to present a comprehensive analysis. We present the bivariate, descriptive results first since these will be most accessible to the reader.

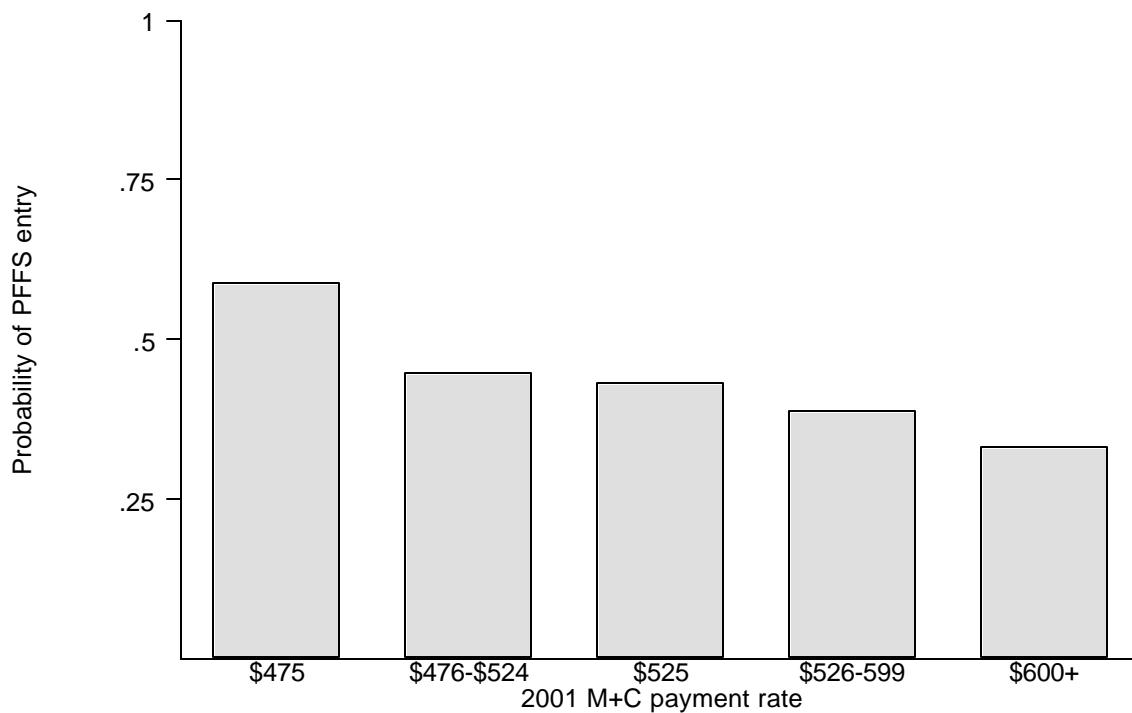
### **4.1 Bivariate Entry Probability Tables and Figures**

We begin on the next page with the effects of payment rates on entry and enrollment, as this is the most prominent policy variable in recent debates and legislation. Following payment rates, we present results for unit cost effects and demand and selection effects, in that order.

### 4.1.1 Payment Rates

As expected, Sterling was disproportionately likely to enter counties that were subject to the rural payment floor (\$475) or the urban payment floor (\$525), entering 59% and 43% of them, respectively. Otherwise, Sterling was generally less likely to enter counties as the payment rate increased. The difference between the 2001 payment rate and the 1999 average fee-for-service cost (labeled “estimated margin” in Table 4.1) suggests that high-payment counties might also be attractive to Sterling, holding other factors constant.

**Figure 4.1**



**Table 4.1**

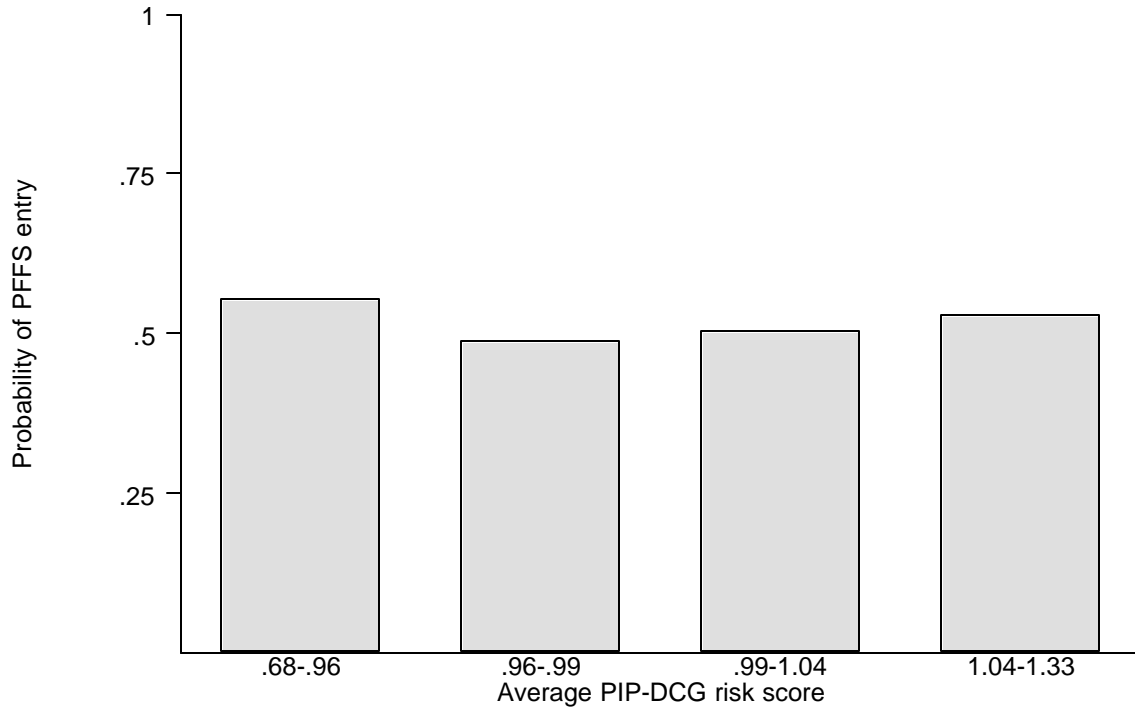
Payment rate	Probability of entry	Estimated margin	Sterling enrollment	Number of counties
\$475	58.9%	\$103	5378	1839
\$476-524	44.9%	\$58	2033	421
\$525	43.2%	\$130	6699	431
\$526-599	38.9%	\$84	4047	324
\$600+	33.3%	\$117	952	114
Total	51.8%	\$99	19109	3129

Notes: Estimated margin is calculated as the difference between 2001 payment rates and 1999 average FFS cost. Enrollment estimates include imputed values for counties with fewer than 11 enrollees. There were 577 Sterling enrollees in counties with missing payment rate data.

### 4.1.2 County average PIP-DCG risk score

As expected, Sterling was most likely to enter counties with low PIP-DCG risk scores, although, it should be noted, there is some evidence of a bimodal relationship in Figure 4.2.

**Figure 4.2**



**Table 4.2**

Average risk score		Probability of entry	Sterling enrollment	Number of counties
from	to			
0.682	0.930	56.4%	1673	264
0.931	0.950	54.0%	2717	261
0.951	0.963	50.9%	2267	269
0.964	0.976	48.1%	1275	287
0.977	0.993	50.8%	3291	311
0.994	1.007	51.3%	1840	298
1.008	1.027	50.3%	1738	338
1.028	1.057	50.1%	1681	357
1.058	1.097	55.5%	1432	364
1.098	1.333	51.3%	1195	380
Total		51.8%	19109	3129

Enrollment estimates include imputed values for counties with fewer than 11 enrollees.

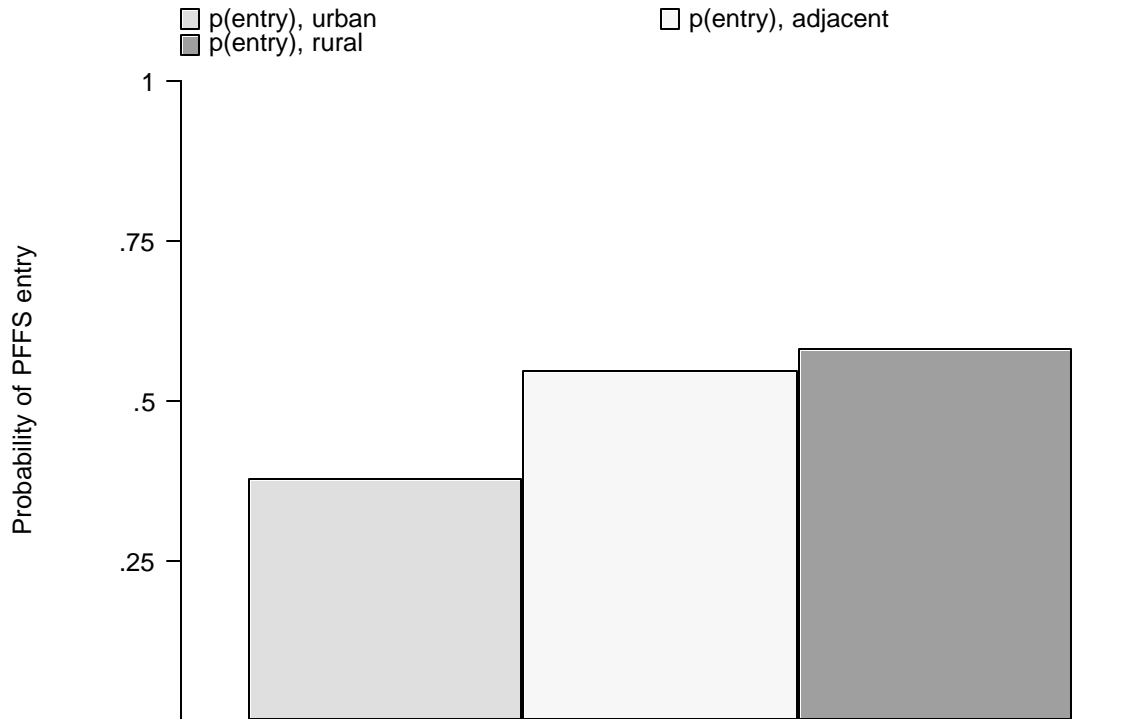
There were 577 Sterling enrollees in counties with missing risk score data.

Counties were divided into ten groups of roughly equal frequency and the actual minimum and maximum for each group are listed in the table.

### 4.1.3 Urban/rural status

In stark contrast to M+C HMOs, Sterling was most likely to enter rural counties, followed by counties adjacent to urban areas, and finally urban areas. Although Sterling entered over 58% of rural counties, Sterling's enrollment was heavily concentrated (65%) in urban areas.

**Figure 4.3**



**Table 4.3**

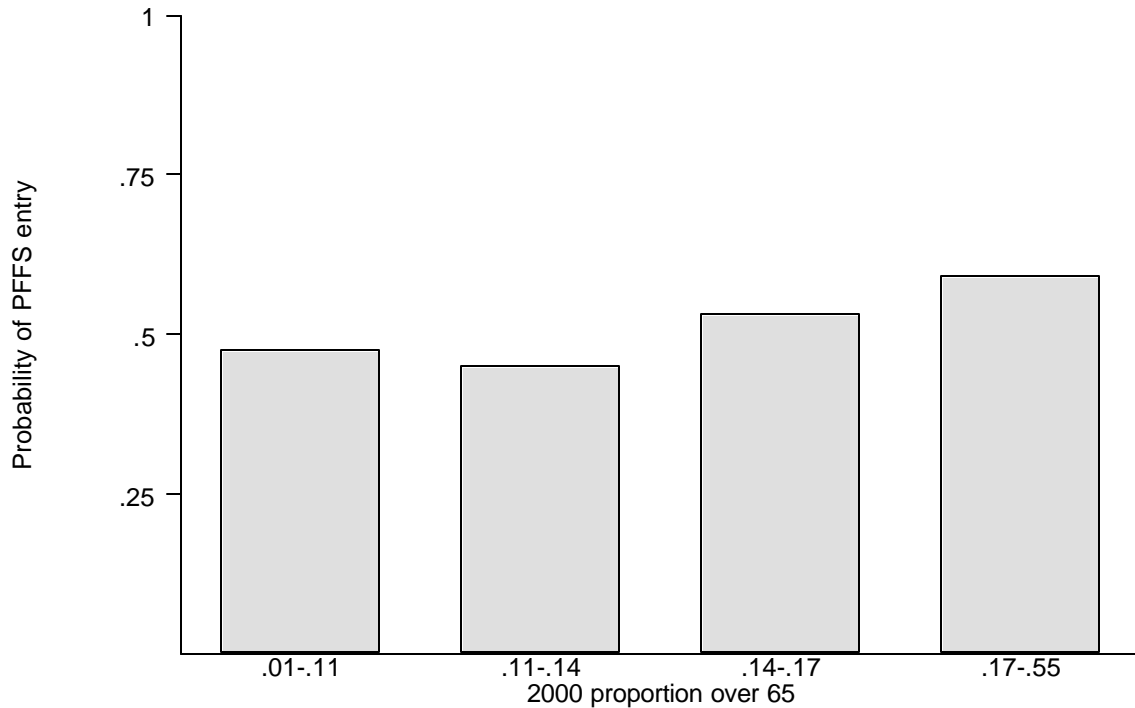
	Probability of entry	Sterling enrollment	Number of counties
Urban	37.7%	12380	835
Adjacent	54.8%	4848	1001
Rural	58.2%	1858	1275
Total	51.6%	19086	3111

Enrollment estimates include imputed values for counties with fewer than 11 enrollees.  
There were 600 Sterling enrollees in counties with missing urbanicity data.

#### 4.1.4 Proportion of population over age 65

Sterling was more likely to enter counties that had a relatively high proportion of their population over age 65. Sterling enrollment, however, was lower in counties with high proportions of elderly.

**Figure 4.4**



**Table 4.4**

Proportion over 65		Probability of entry	Sterling enrollment	Number of counties
from	to			
0.01	0.10	45.7%	4305	278
0.10	0.11	48.0%	3330	246
0.11	0.12	46.9%	2238	277
0.12	0.13	50.0%	1728	286
0.13	0.14	41.7%	1610	314
0.14	0.15	49.4%	1622	308
0.15	0.16	56.1%	1388	330
0.16	0.17	57.6%	859	349
0.17	0.20	59.5%	1119	358
0.20	0.55	58.3%	910	381
Total		51.8%	19109	3127

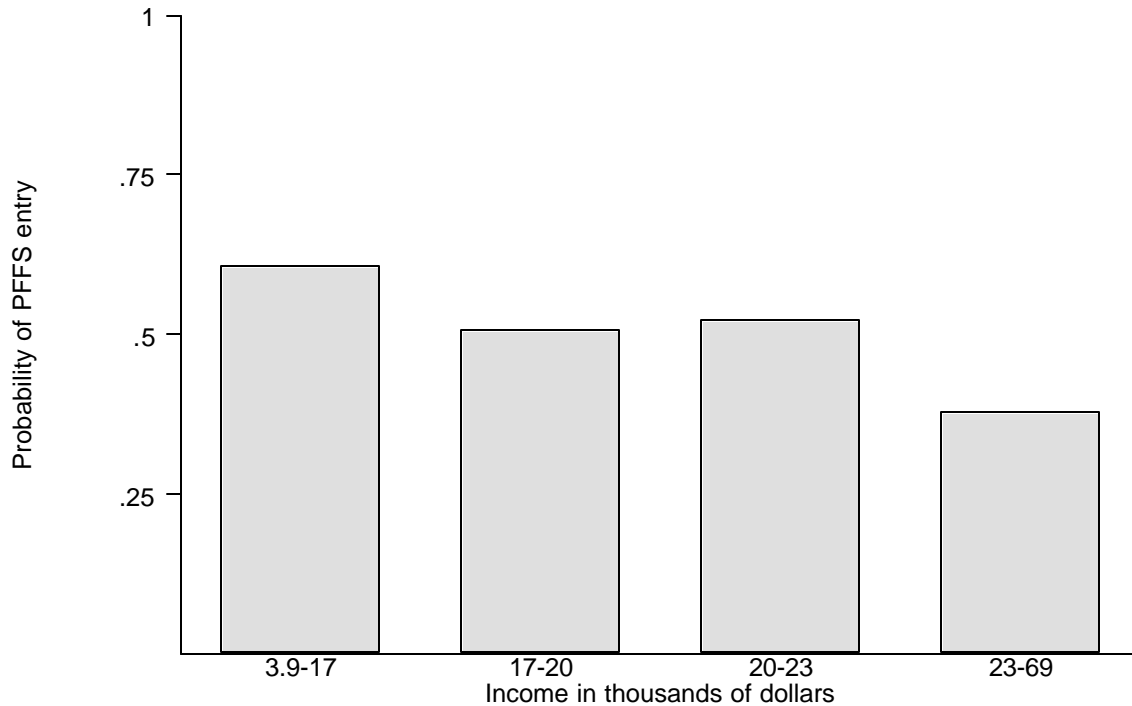
Note that estimated enrollment includes imputed values for counties with fewer than 11 enrollees. There were 577 Sterling enrollees in counties with missing proportion data.



### 4.1.5 Per Capita Income

Sterling was less likely to enter counties with high per capita income.

**Figure 4.5**



**Table 4.5**

Per capita income (\$000)		Probability of entry	Sterling enrollment	Number of counties
from	to			
3.961	15.358	68.9%	1386	386
15.36	16.72	57.1%	1638	347
16.722	17.86	51.2%	1234	367
17.861	18.78	52.0%	1779	350
18.781	19.802	49.0%	1298	337
19.803	20.889	50.7%	1450	337
20.894	22.209	52.2%	1806	320
22.226	24.009	49.8%	4227	289
24.045	27.537	42.4%	2309	224
27.558	68.686	27.1%	1982	170
Total		51.9%	19109	3127

Notes: Per capita income is in thousands of dollars.

Estimated enrollment includes imputed values for counties with fewer than 11 enrollees.

Totals may not equal sum of columns due to rounding.

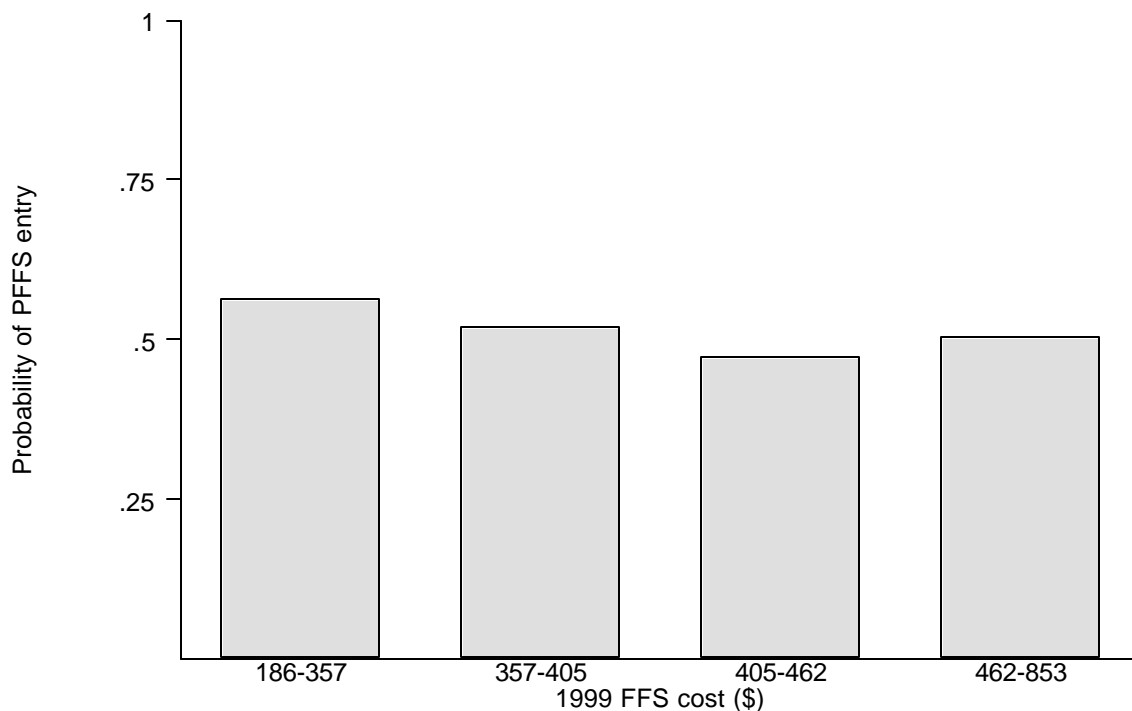
There were 577 Sterling enrollees in counties with missing payment rate data.

Counties were divided into ten groups of roughly equal frequency and the actual minimum and maximum for each group are listed in the table.

#### 4.1.6 FFS cost

Contrary to expectation (developed in Section 2), Sterling was more likely to enter counties with higher 1999 average FFS cost in the multivariate specifications (Table 4.12). This relationship, however, is not observed in the bivariate context, as illustrated in Figure 4.6, which shows a modest negative relationship overall with the highest probability for low-cost counties. It should be noted that there is some evidence of a bimodal relationship between FFS cost and entry, with the probability of entry rising again among high-cost counties.

**Figure 4.6**



**Table 4.6**

1999 FFS cost		Probability of entry	Sterling enrollment	Number of counties
From	to			
\$186.26	\$325.42	63.2%	535	410
\$325.46	\$347.65	51.0%	1109	357
\$347.71	\$367.25	51.4%	1478	354
\$367.31	\$384.91	52.5%	1599	337
\$384.94	\$405.04	51.5%	3098	336
\$405.09	\$422.51	50.3%	1691	306
\$422.52	\$445.98	44.2%	1955	301
\$446.09	\$476.83	46.6%	1310	283
\$476.95	\$521.31	47.9%	4175	240
\$521.54	\$852.65	56.1%	2159	205
Total		51.8%	19109	3129

Enrollment estimates include imputed values for counties with fewer than 11 enrollees.

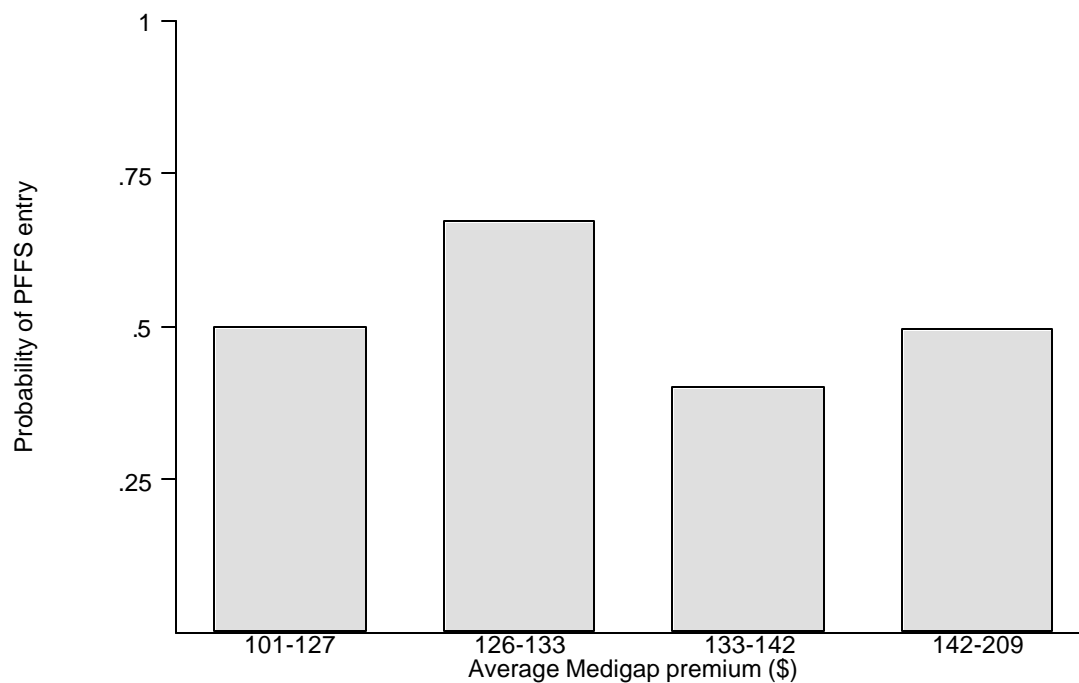
There were 577 Sterling enrollees in counties with missing payment rate data.

Counties were divided into ten groups of roughly equal frequency and the actual minimum and maximum for each group are listed in the table.

### 4.1.7 Medigap Premiums

Sterling was less likely to enter counties with high Medigap premiums. This result is counter-intuitive in one sense – higher Medigap premiums might suggest a larger competitive space for Sterling, which sells at the same out-of-pocket premium in all its service areas. More likely, however, high Medigap premiums reflect adverse selection in the local market for supplemental insurance. By contrast, note that Sterling enrollment was higher in these counties, reflecting the unambiguous incentive to beneficiaries.

**Figure 4.7**



**Table 4.7**

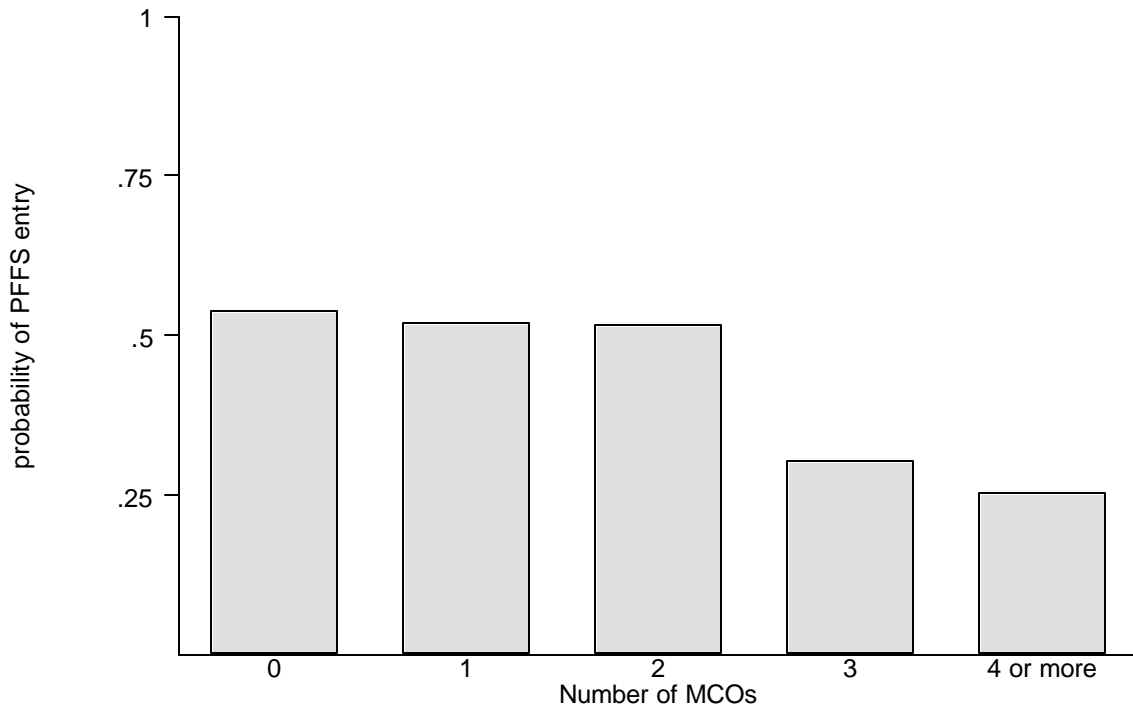
Average Medigap premium		Probability of entry	Sterling enrollment	Number of counties
from	to			
\$101	\$117	74.6%	2443	350
\$117	\$124	46.9%	362	405
\$124	\$127	33.8%	115	340
\$127	\$130	61.4%	1290	295
\$131	\$133	75.3%	1973	312
\$133	\$135	48.3%	1750	344
\$135	\$139	24.7%	1653	300
\$139	\$144	73.9%	2894	287
\$144	\$153	54.1%	3934	270
\$153	\$209	14.6%	2686	212
Total		51.7%	19100	3115

Notes: Estimated enrollment includes imputed values for counties with fewer than 11 enrollees. There were 586 Sterling enrollees in counties with missing Medigap premium data.

### 4.1.8 Number of managed care organizations

Sterling was about as likely to enter counties with existing MCOs as counties with no managed care presence. As expected, however, Sterling’s probability of entry declined as the number of MCOs increased.

**Figure 4.8**



**Table 4.8**

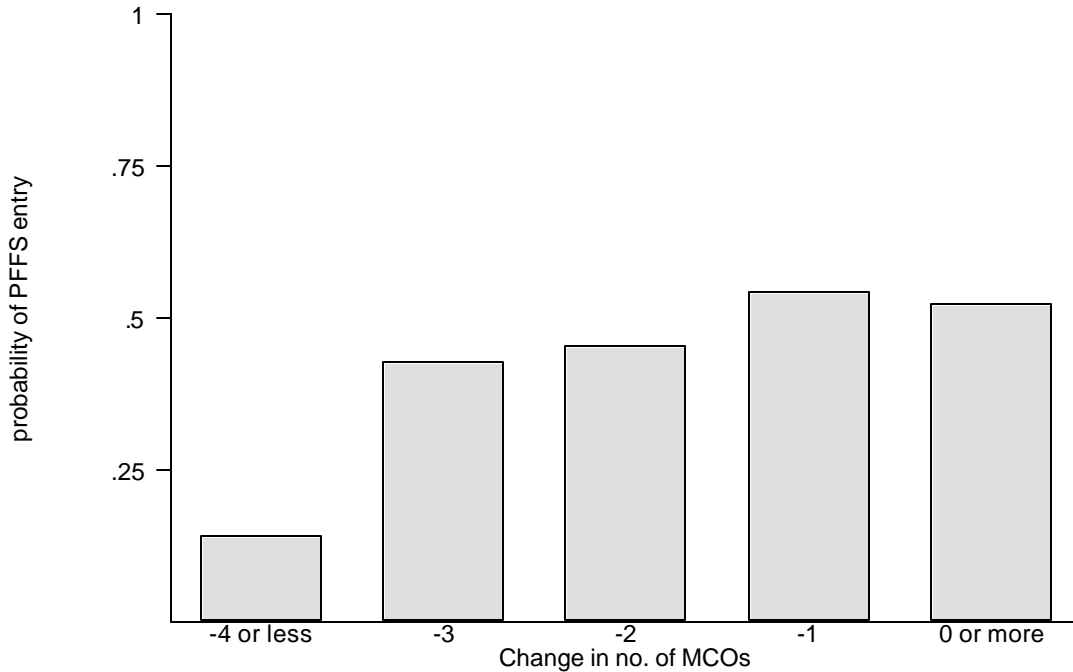
Number of MCOs	Probability of entry	Sterling enrollment	Number of counties
0	53.8%	10199	2417
1	52.0%	4430	327
2	51.6%	3172	184
3	30.5%	1161	95
4	27.9%	273	43
5	28.6%	78	28
6	23.1%	74	13
7	42.9%	248	7
8	0.0%	3	3
9	0.0%	0	3
10	0.0%	9	3
11	0.0%	3	1
12	0.0%	3	2
13	100.0%	27	1
14	0.0%	3	1
22	0.0%	3	1
Total	51.8%	19686	3129

Note that the number of MCOs includes only HMOs (not cost, demo, HCPP, or other plans).  
 Estimated enrollment includes imputed values for counties with fewer than 11 enrollees.

### 4.1.9 Change in the number of managed care organizations

The bivariate tabulation (Figure 4.9 and Table 4.9) suggests that Sterling was somewhat less likely to enter counties that had experienced managed care organization exits over the previous year (from 2000 to 2001). However, the multivariate analysis suggests the contrary (Table 4.12), holding other factors constant, finding that both Sterling entry and Sterling enrollment were positively associated with HMO withdrawals.<sup>13</sup>

**Figure 4.9**



**Table 4.9**

Change in No. of MCOs	Probability of entry	Sterling enrollment	Number of counties
-6	33.3%	233	3
-5	25.0%	456	8
-4	5.9%	63	17
-3	42.9%	2920	49
-2	45.5%	2976	99
-1	54.5%	5838	314
0	52.5%	6969	2597
1	41.5%	228	41
2	0.0%	3	1
Total	51.8%	19686	3129

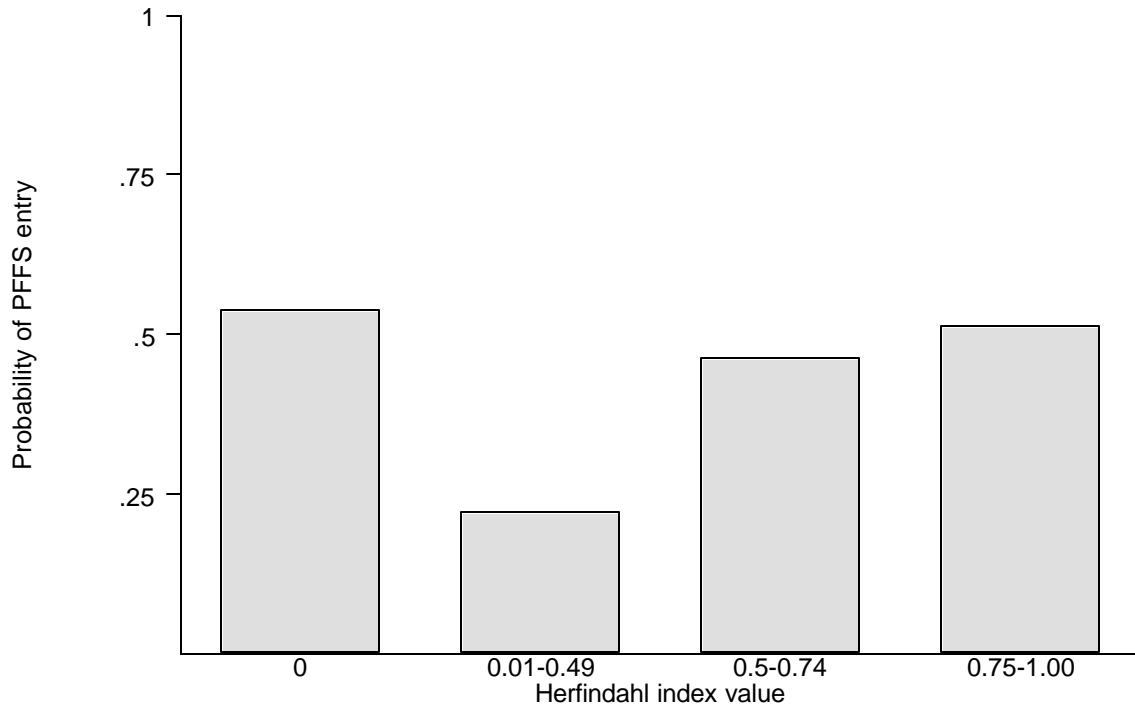
Note that the number of MCOs includes only HMOs (not cost, demo, HCPP, or other plans).  
Estimated enrollment includes imputed values for counties with fewer than 11 enrollees.

<sup>13</sup> Note that Sterling's entry decisions could not have taken account of these exit decisions, since Sterling's 2001 entry and exit decisions had to be formally declared at the same time as those of other plans.

#### 4.1.10 Managed care industry concentration (Herfindahl index)

The pattern of Sterling entry was distinctly bimodal with respect to managed care industry concentration. At one extreme, Sterling entered approximately 54% of counties with no managed care presence (Herfindahl index = 0). At the other, Sterling entered 51% of counties with high managed care concentration (Herfindahl index between 0.75 and 1).

**Figure 4.10**



**Table 4.10**

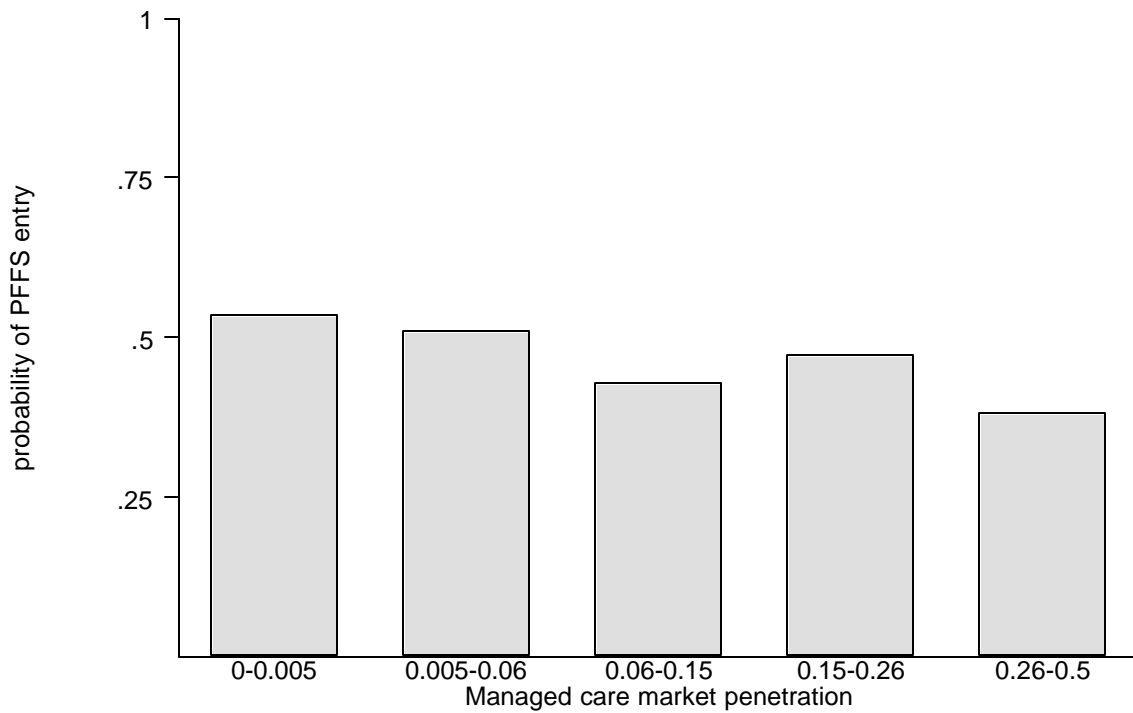
Index value	Probability of entry	Sterling Enrollment	Number of counties
0	53.8%	10199	2417
0.01-0.49	22.3%	588	121
0.5-0.74	46.4%	2956	181
0.75-1.00	51.2%	5943	410
Total	51.8%	19686	3129

Note that estimated enrollment includes imputed values for counties with fewer than 11 enrollees.

### 4.1.11 Managed care market penetration

Contrary to the bivariate results displayed below, multivariate analysis (Table 4.12) indicates that Sterling was more likely to enter counties when managed care market penetration was high, holding other factors constant. The negative bivariate relationship shown in Figure 4.11 is probably generated by the negative relationship between Sterling entry and the intensity of competition among HMOs.

**Figure 4.11**



**Table 4.11**

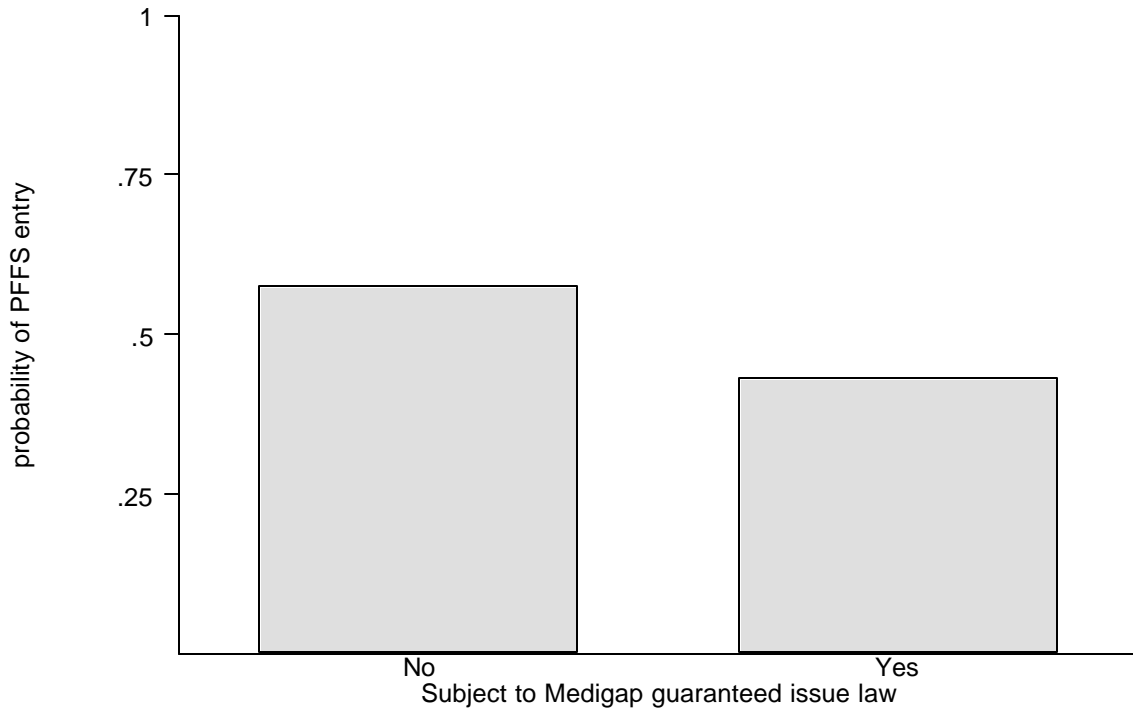
Market penetration		Probability of entry	Sterling enrollment	Number of counties
from	to			
0.000	0.005	53.5%	9783	2450
0.005	0.063	51.1%	3365	233
0.063	0.145	43.0%	1128	179
0.146	0.255	47.4%	2007	152
0.255	0.521	38.3%	2826	115
Total		51.8%	19109	3129

Notes: Estimated enrollment includes imputed values for counties with fewer than 11 enrollees.  
There were 577 Sterling enrollees in counties with missing market penetration data.

#### 4.1.12 Medigap Guaranteed Issue for Disabled Beneficiaries

Sterling was substantially less likely to enter counties in states with Medigap guaranteed issue laws for disabled beneficiaries (the reduction in probability was 16 percentage points in the multivariate analysis).

**Figure 4.12**





## **4.2 Multivariate Results**

Although many of the strongest effects can be readily seen in the simple bivariate tabulations presented in Section 4.1, additional results are apparent from the multivariate specifications presented in Table 4.12. The first two columns respectively contain coefficient estimates and marginal probability effects from the entry model. The third column contains results from the enrollment model, conditional on entry.

### **Counties where Sterling’s parent company sells Medigap insurance**

In counties where Sterling’s parent company (the Combined Insurance Company of America) sells Medigap insurance, Sterling enrolled about 12 more beneficiaries on average (column 3). Relative to the overall average Sterling enrollment, conditional on entry, of 11 per county, this is a substantial effect. This result may reflect a marketing or “agent” effect – Sterling enrolls more beneficiaries in counties where it already has a marketing network (and possibly agents) in place. This result will be important to pursue in the Sterling case study.

### **Number of physicians per thousand persons**

Sterling enrolled more beneficiaries in counties with high numbers of physicians per thousand persons. The results suggest that an increase of one physician per thousand persons was associated with about 6 more Sterling enrollees (column 3).

### **Number of hospital beds per thousand persons**

Sterling enrolled slightly fewer beneficiaries in counties with high numbers of hospital beds per thousand persons. The results suggest that an increase of one bed per thousand persons was associated with about 1 fewer Sterling enrollees (column 3).

### **Number of Medicare beneficiaries**

Sterling enrolled more beneficiaries in counties with high Medicare populations. The results suggest that an increase of 10,000 beneficiaries in a county was associated with about 2 more Sterling enrollees (column 3).

**Table 4.12 Multivariate Results**

Variable	Entry model		Enrollment model Coefficient (Standard error)
	Coefficient (Standard error)	Marginal effect	
2001 payment	-0.001 (0.001)	-0.1%	-0.190*** (0.069)
\$475 indicator	0.328*** (0.079)	13.0% <sup>(a)</sup>	-6.222 (5.599)
\$525 indicator	0.370*** (0.101)	14.5% <sup>(a)</sup>	0.138 (7.440)
1999 FFS cost	0.004*** (0.000)	0.2%	0.144*** (0.034)
PIP-DCG score	-3.085*** (0.461)	-12.3% <sup>(b)</sup>	-67.788** (32.955)
Urban	-0.464*** (0.096)	-18.3% <sup>(a)</sup>	31.336*** (6.882)
Adjacent	-0.063 (0.057)	-2.5% <sup>(a)</sup>	13.733*** (3.910)
MDs per 1000	-0.033 (0.023)	-1.3%	4.820*** (1.581)
Beds per 1000	-0.003 (0.005)	-0.1%	-0.972** (0.456)
Per capita income <sup>(c)</sup>	-0.054*** (0.008)	-2.2%	0.446 (0.550)
Proportion over 65	1.431** (0.635)	5.7% <sup>(b)</sup>	-98.494** (45.529)
MCO market penetration	1.439*** (0.567)	5.7% <sup>(b)</sup>	-15.722 (37.707)
M+C premium (yes/no)	0.088 (0.163)	3.5% <sup>(a)</sup>	-30.945*** (10.073)
M+C premium (\$)	-0.001 (0.002)	-0.0%	-0.034 (0.157)
Other M+C plans (yes/no)	0.027 (0.357)	1.1% <sup>(a)</sup>	32.934 (24.016)
Num. of other M+C plans	-0.118** (0.060)	-4.7%	-12.650*** (4.274)
Herfindahl index	0.223 (0.315)	0.9% <sup>(b)</sup>	7.100 (21.333)
Change in number of plans	-0.144*** (0.043)	-5.7%	-34.430*** (2.901)
Sterling Medigap	0.006 (0.055)	0.3% <sup>(a)</sup>	12.615*** (4.198)
Guaranteed issue	-0.400*** (0.053)	-15.9% <sup>(a)</sup>	-0.245 (4.261)
Medigap premium	-0.017*** (0.002)	-0.7%	0.635*** (0.176)
Thousands of M'care eligibles	0.001 (0.001)	0.0%	0.253*** (0.076)
Constant	5.460*** (0.729)		-13.358 (51.226)
Number of observations	3115		1611
Pseudo R <sup>2</sup>	0.09		0.05

Notes:

\*\*\* Significant at 1%.

\*\* Significant at 5%.

(a) Marginal effect is for discrete change of indicator variable from 0 to 1.

(b) Marginal effect is for 10-percentage-point change in index or proportion variable.

(c) Income measured in thousands of dollars.

## 5 Discussion

Each of the results presented in the previous section may be subject to more than one interpretation. In what follows, we have tried to advance interpretations that are no more complex than necessary and that are consistent with each other as much as possible. Our goal is to suggest some hypotheses concerning Sterling's strategy and behavior and the enrollment decisions of beneficiaries.

### 5.1 *Payment Rate and Unit Cost Effects*

Sterling appears to have responded to the incentives created by BBA and subsequent legislation, entering counties subject to urban and rural payment floors in disproportionate numbers. Since these payment floors were probably intended to attract HMOs, not necessarily PFFS (which has lower administrative costs), this result potentially raises concerns about whether these payments are appropriate. However, the fact that Sterling has not yet attracted enrollment disproportionately from these counties mitigates the concern. More broadly, Sterling appears at first to have aggressively sought business in rural areas by disproportionately entering rural counties. However, Sterling's urban/rural enrollment pattern does not yet correspond to its entry decisions, so the potential of PFFS to offer an alternative to rural beneficiaries remains largely unfulfilled – either because rural beneficiaries do not want the option to the extent evident elsewhere or because Sterling has yet to make a substantial sales effort in rural areas.

In general, Sterling appeared to react in expected ways to variations in factors that affect the cost of production. Holding other factors equal, Sterling avoided counties with high average PIP-DCG risk scores, low proportions of county residents over age 65, high per capita income, and those lacking a Sterling Medigap presence. By contrast, the relationship between Sterling entry and 1999 county average FFS cost was our most unexpected result. Sterling was substantially more likely to enter and enroll beneficiaries in counties with higher FFS cost. Given the highly skewed nature of the county average FFS cost distribution and the fact that this relationship was not observed in the bivariate analysis, it is possible that this result would not be robust to more recent data or to an average over time. This could be investigated in future research.

Although significant, none of these effects was so strong as to suggest that Sterling was targeting its marketing efforts exclusively at a narrow market segment, defined by payment or cost characteristics. This overall observation tends to mitigate concerns raised by some of the results for each individual incentive.

### 5.2 *Demand and Selection Effects*

In general, Sterling seemed to be more likely to enter the market, and more likely to attract enrollees, in counties with less intense competition from other M+C plans. The strongest of these results indicated that Sterling entered counties experiencing M+C plan withdrawals. Although Sterling may not have *decided* to enter these counties for this reason (note, for example, that many withdrawals were not announced until after Sterling's entry

decisions had been made), it is plausible to conclude that this factor played an important role in Sterling's enrollment success in these counties.

Reinforcing this general conclusion, Sterling was more likely to enter counties with low numbers of HMOs. This result suggests that Sterling was attracted to markets dominated by a few plans—favorable conditions for exploiting market power to extract profits. To the extent that Sterling's entry into these markets increased competition among plans, this outcome was likely to produce additional value for Medicare beneficiaries without increasing the financial burdens on the Trust Fund (Pizer and Frakt, 2002).

With respect to competition from Medigap products, Sterling attracted more enrollees in counties where Medigap premiums were relatively high, as expected, but Sterling was less likely to have entered those markets. Sterling executives may have been concerned that high Medigap premiums reflected severe adverse selection in the supplemental insurance market in those areas.

In addition to the intensity of competition, Sterling may have been influenced by perceived differences in regulatory climate and the prospects for smooth acceptance by providers. In our model, *the largest single influence on Sterling's entry decision (16 percentage points) was the presence or absence of a Medigap guaranteed issue law for disabled beneficiaries*. Since Sterling was *less* likely to enter counties with such laws, we suspect that Sterling was primarily concerned about the general strictness of the regulatory climate in these areas, not about the prospect of attracting disproportionate numbers of disabled beneficiaries in counties without such regulations. In a similar spirit, we hypothesize that Sterling's propensity to enter counties with higher managed care market penetration reflected a belief that providers in those counties would be more accustomed to accepting payment from M+C plans than providers in counties with less exposure.

### **5.3 Conclusion and Next Steps**

In this report we have analyzed county-level data pertaining to the market entry decisions and enrollment experience of the Sterling Option 1 Private Fee-for-Service plan. Applying simple, bivariate tabulations as well as more complex multivariate statistical techniques, a number of hypotheses have emerged. Stated briefly, the most important hypotheses are:

- *Sterling attempted to take advantage of payment incentives established by BBA and subsequent legislation to encourage entry into underserved areas.*
- *Sterling attempted to minimize costs by avoiding counties with high average PIP-DCG risk scores and by targeting counties with high concentrations of potential customers or with an existing Sterling infrastructure for sales and service.*
- *Sterling sought out markets where incumbent plans might be exploiting market power, making low-risk beneficiaries potentially receptive to new products.*

- *Sterling sought out markets with relatively fewer regulatory constraints and relatively high provider acceptance of nontraditional payors.*
- *Sterling enrollees were motivated by relatively high Medigap premiums and reductions in the availability of HMO coverage brought about by M+C plan withdrawals.*

Although each of these hypotheses is supported by quantitative evidence presented in this report, strong conclusions need not be drawn at this point. As our evaluation proceeds, we will further investigate each hypothesis through interviews, analyses of survey results, and analyses of administrative databases (including claims and encounter data), ultimately leading to more definitive conclusions.

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