SparkPoint Bundled Services Analysis

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Abstract

The purpose of this analysis is to evaluate the efficacy of a combination of services—informally called the "magic bundle"— in helping SparkPoint clients achieve outcomes of interest, especially as the effect may differ across sites. In Section 1, we summarize site-specific patterns, as they are both of independent interest and relevant to assessing the appropriateness of modeling assumptions. In Section 2, we fit regression models to study the effect of the magic bundle. We conclude that the chance of achieving a self-sufficient income is consistently improved among those participating in this combination of services, but that there is no consistent effect upon other measured outcomes.

Contents

1 Profiles of SparkPoint centers

In this section we examine differences in client characteristics and services offered at the 9 SparkPoint centers.

Summary of findings:

- SparkPoint Plaza Adelante clients have the highest median income, expenses, credit card debt, savings, and credit scores at baseline.

- SparkPoint Plaza Adelante has the highest percentage of missing data in baseline assessments, and SparkPoint Skyline has the lowest.

- The distribution of services provided varies widely across SparkPoint centers. The Obtain Employment service is rarely used at Plaza Adelante, while the Obtain Benefits service is rarely used at Marin, Oakland, and West Contra Costa.

1.1 Client characteristics at baseline

Figure 1 displays histograms of the baseline client characteristics in each SparkPoint center. Each row corresponds to a different SparkPoint center, and each column is a different baseline characteristic: we plot total income, total expenses, total credit card debt, total savings, and TransUnion credit score. For ease of viewing, outliers, missing values, and zeros have been removed, and the first four columns are plotted on the logarithmic scale.

Table 1 lists the median of each characteristic at each center. Here, outliers and zeros are factored into the calculations.

Center	Income	Expenses	CC Debt	Savings	Credit Score
SparkPoint American Canyon	1320	1050	0	11	594
SparkPoint East Contra Costa - Bay Point	1362	1837	0	84	591
SparkPoint Fremont	1558	2137	881	450	604
SparkPoint Marin	1365	1850	0	308	615
SparkPoint Oakland	1279	1227	0	20	562
SparkPoint Plaza Adelante - San Francisco	1757	2212	715	1600	682
SparkPoint Skyline	923	975	0	450	633
SparkPoint Solano	1360	1684	0	130	591
SparkPoint West Contra Costa - Richmond	1600	1713	0	385	602

Table 1: Median baseline income, expenses, credit card debt, savings, and TransUnion credit scores at 9 SparkPoint centers.

As Figure 1 and Table 1 both indicate, Plaza Adelante clients tend to have higher income, expenses, credit card debt, savings, and credit scores at baseline than clients at other centers, and the opposite is true for Oakland clients. At Skyline, a high percentage of clients declare zero income at baseline, leading to a very low median baseline income, but savings and credit scores are on the higher end of the spectrum.
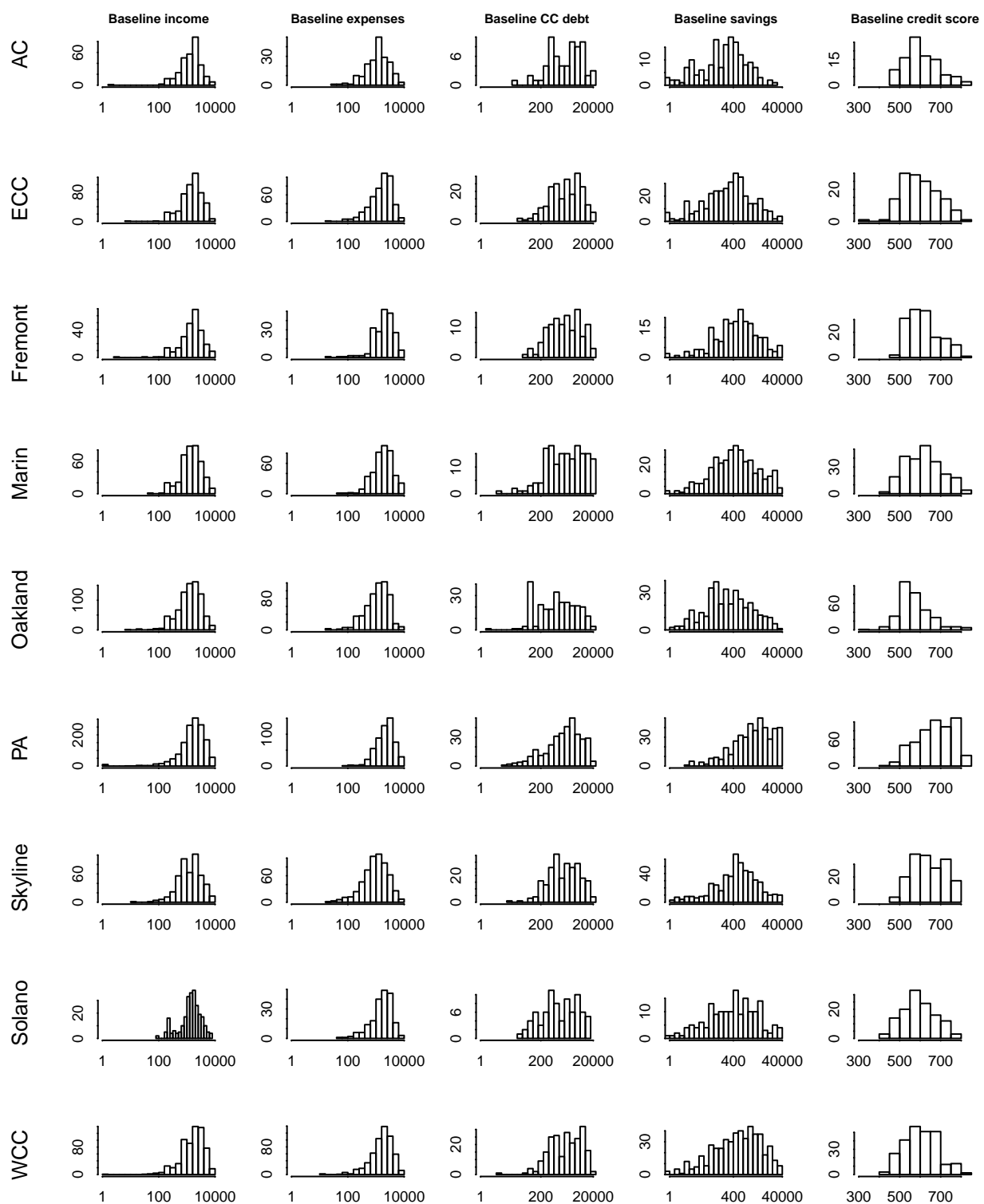
Figure 1: Distribution of baseline income, expenses, credit card debt, savings, and TransUnion credit scores at 9 SparkPoint centers.

Table 2 lists the percentage of missing data for each characteristic at each center. We say baseline income is missing if every income question in the baseline assessment is left blank; analogous definitions apply for expenses, credit card debt, and savings. Table 2 indicates that baseline income is rarely missing, whereas baseline TransUnion credit score is frequently missing. Plaza Adelante clients have by far the highest frequency of missing data for expenses, credit card debt, and savings, while Skyline clients have the lowest frequency.

Center	Income	Expenses	CC Debt	Savings	Credit Score
SparkPoint American Canyon	17%	49%	44%	38%	78%
SparkPoint East Contra Costa - Bay Point	1%	23%	24%	9%	77%
SparkPoint Fremont	0%	26%	34%	12%	47%
SparkPoint Marin	5%	12%	10%	7%	50%
SparkPoint Oakland	7%	36%	34%	30%	66%
SparkPoint Plaza Adelante - San Francisco	4%	61%	66%	48%	67%
SparkPoint Skyline	0%	5%	7%	1%	72%
SparkPoint Solano	4%	31%	31%	20%	59%
SparkPoint West Contra Costa - Richmond	0%	20%	24%	17%	67%

Table 2: Percentage of missing values for baseline income, expenses, credit card debt, savings, and TransUnion credit scores at 9 SparkPoint centers.

1.2 Services provided

Figure 2 shows the distribution of services provided at each SparkPoint center. Only the most common services are plotted, namely, Budgeting and Spending Plan, Decrease Debt, Financial Goals Including Savings, Increase Credit Score, Obtain Benefits, Obtain Employment, Tax Preparation, and Workshop Attended: Credit. The bar heights represent the percentage of clients receiving each service at each center; for example, at American Canyon, 22% of clients receive the service Budgeting and Spending Plan. We observe the following:

- There is considerable variability in the distribution of services provided across centers.

- At Fremont, the majority of clients receive all four of the services Budgeting and Spending Plan, Decrease Debt, Financial Goals Including Savings, and Increase Credit Score.

- The Obtain Employment service is popular at all SparkPoint centers except Plaza Adelante, where the most popular services are Obtain Benefits and Tax Preparation.

- The Obtain Benefits services is popular at all SparkPoint centers except Marin, Oakland, and West Contra Costa.

- The service Workshop Attended: Credit is most popular at Oakland and West Contra Costa.

- The Budgeting and Spending Plan service and the Financial Goals Including Savings service are perfectly correlated in the data. Every client who receives the former also receives the latter, and vice versa. Therefore, in each center, the percentage of clients receiving Budgeting and Spending Plan is the same as the percentage of clients receiving Financial Goals Including Savings.
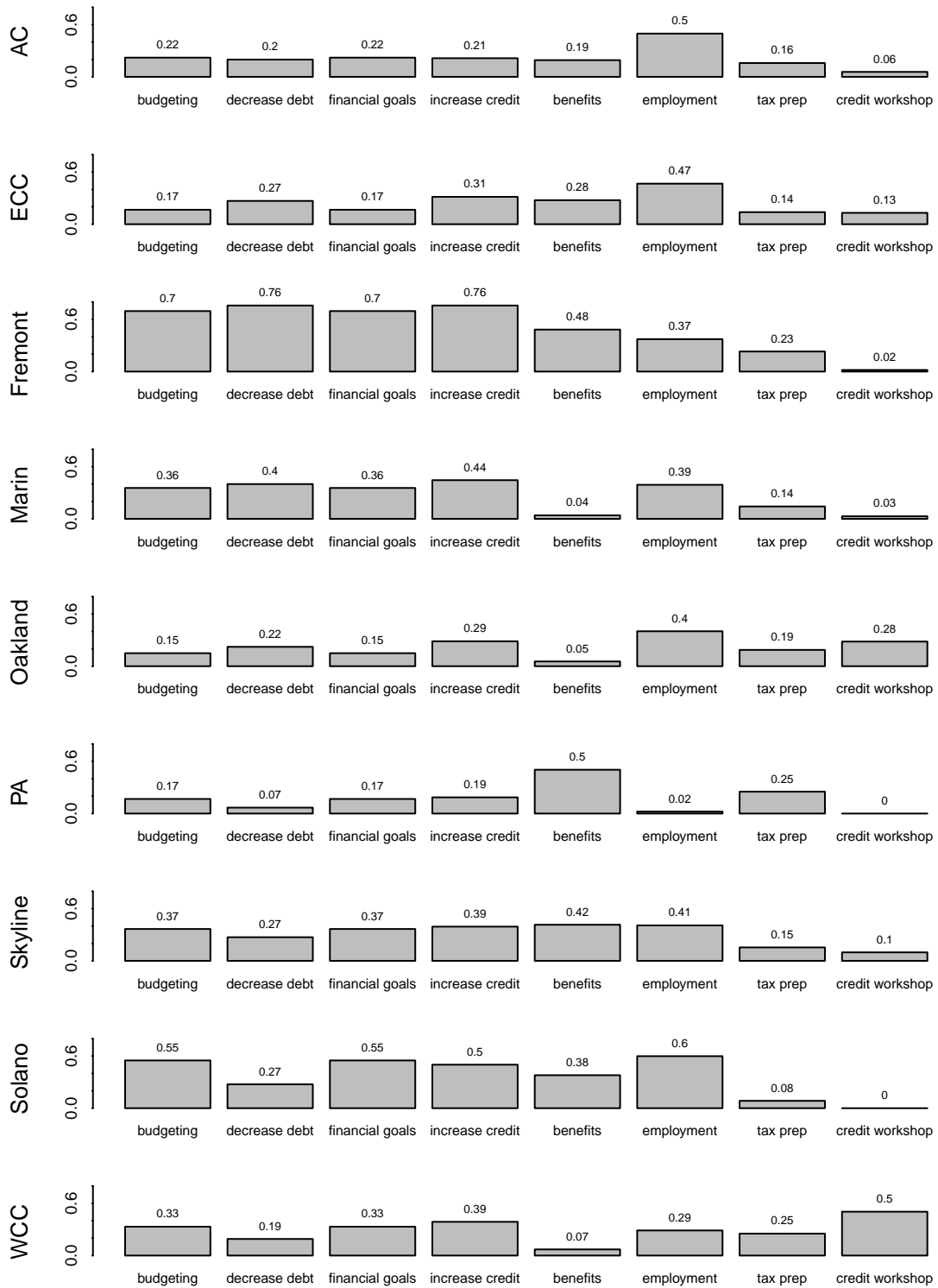
Figure 2: Percentage of clients receiving common services at 9 SparkPoint centers.

Figure 3 displays the distribution of the number of services used per person, across centers. Clients at Skyline tend to access considerably more services than those at other centers, and those at Plaza Adelante typically only access one or two.

2 Analysis of magic bundle

In this section we compare the outcomes of clients who receive the magic bundle to those who do not. The analysis is done at the site level.

Summary of findings:

- Clients receiving the magic bundle have similar baseline characteristics to clients not receiving the magic bundle. However, magic-bundle recipients are less likely to have missing information at baseline, and they are more likely to receive other SparkPoint services besides the magic bundle.

- The outcome that is consistently impacted by receipt of the magic bundle is "self-sufficient income". At nearly all SparkPoint centers, a client who receives the magic bundle reduces their distance to self-sufficiency by \$100-\$700 more on average (depending on the center) than a client who has the same baseline distance to self-sufficiency but does not receive the magic bundle. This finding is robust to model specification, and it is the only one that attains traditional thresholds of statistical significance. The centers where the effect of the magic bundle are largest are American Canyon and East Contra Costa.

- At American Canyon, Marin, and West Contra Costa, there is mild evidence that clients who receive the magic bundle make greater progress toward the "savings $\geq$ three months' expenses" outcome. At these centers, a client who receives the magic bundle reduces the gap between savings and three months' expenses by \$1000-\$2000 more on average (depending on the center) than a client who has the same baseline gap between savings and three months' expenses but does not receive the magic bundle.

- The impact of the magic bundle on "DTI $\leq 40\%$" and "credit score ≥ 650" is not consistent across centers, and based on the available data it is indistinguishable from zero effect.

2.1 Definitions

2.1.1 Outcomes

We use the same outcome definitions as in the Successful SparkPoint Clients Analysis report.

- DTI $\leq 40\%$: This outcome is achieved if a client has DTI greater than 40% at baseline and $\leq 40\%$ at the most recent follow-up. DTI is total monthly debt divided by total income, where total monthly debt and total income are defined as follows.

  - Total monthly debt is the sum of all minimum monthly payments (section E of the baseline assessment) and monthly rent.
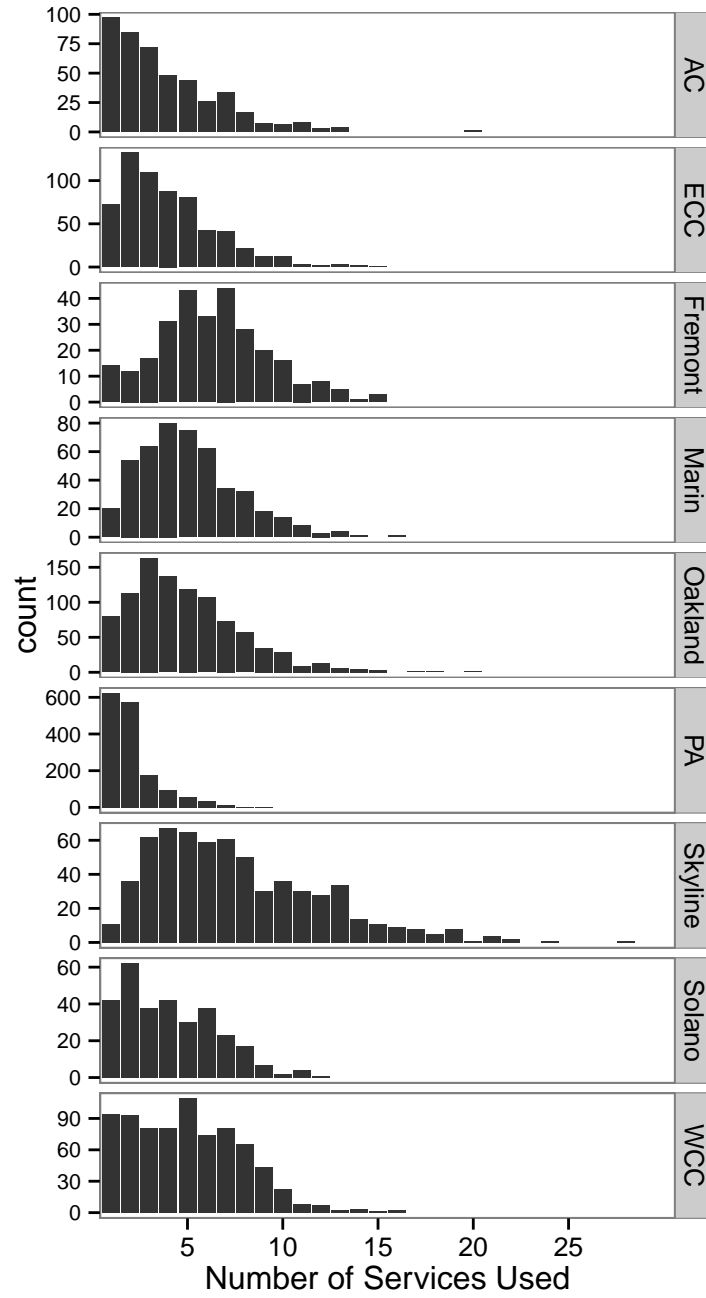 - Total income is the sum of all income sources in section B of the baseline assessment.

Figure 3: Distribution of the number of services accessed per person at the 9 SparkPoint centers.

- Credit score ≥ 650: This outcome is achieved if a client has at least one credit score below 650 at baseline and at least one credit score ≥ 650 at the most recent follow-up.

- Self-sufficient income: This outcome is achieved if a client's total income is less than their self-sufficiency standard at baseline and is greater than or equal to their self-sufficiency standard at the most recent follow-up. The definition of total income is the same as in the calculation of DTI.

- Savings ≥ three months' expenses: This outcome is achieved if a client's total savings are less than three months' worth of expenses at baseline, and greater than or equal to three months' expenses at the most recent follow-up.

  - Total savings is the sum of all balances in section C of the baseline assessment.
  - Total expenses is the sum of all monthly expenses in section F of the baseline assessment, plus the sum of all minimum monthly payments in section E of the baseline assessment.

2.1.2 Clients analyzed

We define the following types of clients.

- Measurable client: A measurable client is a client with a baseline assessment and at least one follow-up assessment.

- Potential achiever: For a given outcome, a potential achiever is a measurable client who has not yet achieved the outcome at the time of baseline assessment. A client whose outcome is missing at baseline is not considered a potential achiever of the outcome.

  - Example: A client with a baseline DTI of 60% and all baseline credit scores above 650 is a potential achiever for the "achieve DTI ≤ 40%" outcome, but not for the "achieve credit score ≥ 650" outcome. A client whose baseline DTI is missing is not a potential achiever for the "achieve DTI ≤ 40%" outcome.

- Successful client: For a given outcome, a successful client is a potential achiever who has achieved the outcome at the time of the most recent follow-up assessment.

  - Example: A client with a baseline DTI of 60% and a follow-up DTI of 35% during the most recent follow-up assessment is a successful client for the "achieve DTI ≤ 40%" outcome, but may not be a successful client for other outcomes.

For each center and each outcome of interest, Figure 4 shows the number of measurable clients, the number of potential achievers, and the number of successful clients. Our analysis for each outcome was restricted to potential achievers of the outcome.

Figure 4 highlights the challenge that limited sample sizes will pose in the subsequent analysis. For smaller centers such as American Canyon and Fremont, the number of clients achieving a given long-term outcome is in the single digits or low double digits.

At all centers except Skyline, "savings ≥ three months' expenses" was the least frequently achieved outcome. The number of potential achievers for "DTI ≤ 40%" and "credit score ≥ 650" is lower than for the other two outcomes, due to missing data.
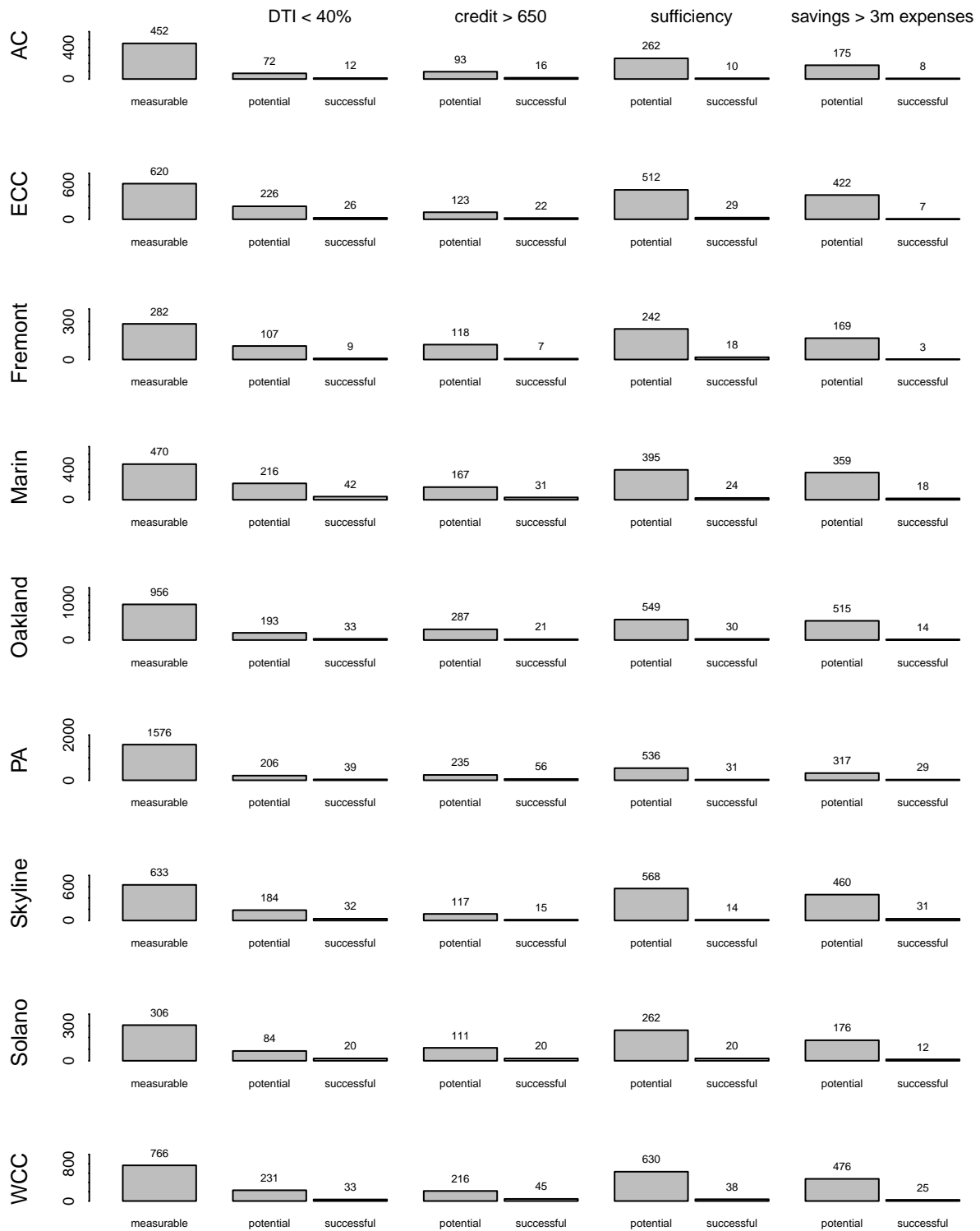
Figure 4: Number of measurable clients at each SparkPoint center, as well as the number of potential achievers and successful clients for each of the four long-term outcomes.

2.1.3 Magic bundle

The magic bundle is defined as the combination of:

- Obtain Employment *and*

- Either of the following two services:

    - Budgeting and Spending Plan
    - Financial Goals Including Savings

As noted in Section 1.2, the service Budgeting and Spending Plan is perfectly correlated with the service Financial Goals Including Savings, so the either/or definition is redundant in this dataset.

Figure 5 shows the number of clients who received the magic bundle at each SparkPoint center. West Contra Costa had the most clients receiving the magic bundle (133), followed by Skyline (110) and Solano (86). By contrast, only 9 clients at Plaza Adelante received the magic bundle. This is unsurprising given Figure 2, which indicates that only 2% of Plaza Adelante clients received the service Obtain Employment, a necessary component of the magic bundle. Due to the very small sample size, we have not attempted to analyze the impact of the magic bundle in Plaza Adelante.
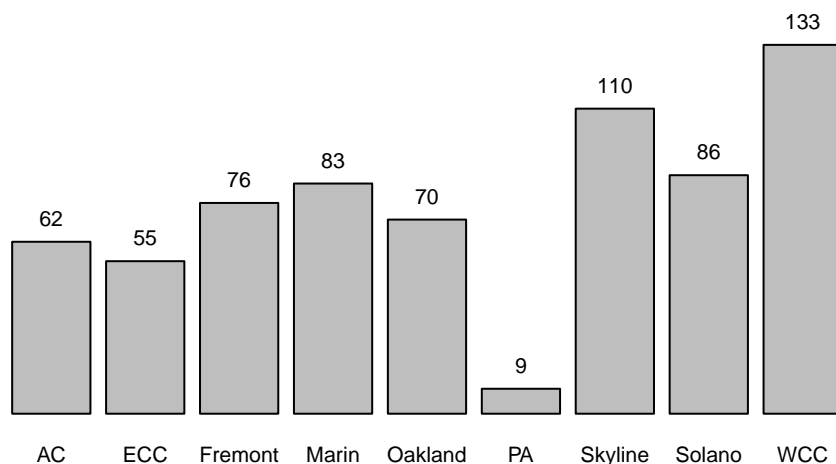

Figure 5: Number of clients receiving magic bundle at 9 SparkPoint centers.

2.2 Baseline characteristics of clients receiving magic bundle

Our first question is: do clients who receive the magic bundle have noticeably different characteristics at baseline than clients who do not receive the magic bundle? This is important for accurately evaluating the effectiveness of the magic bundle. If clients with higher baseline income, savings, and credit scores are more likely to receive the magic bundle, then the magic bundle may appear more effective than it actually is, simply because the clients receiving the magic bundle are more

likely to succeed by virtue of their favorable baseline characteristics. Conversely, if clients with lower baseline income, savings, and credit scores are more likely to receive the magic bundle, then the magic bundle may appear less effective because clients receiving the magic bundle have disadvantaged baseline characteristics. Thus, for the purpose of evaluating the magic bundle, the ideal scenario would be if clients receiving the magic bundle looked substantially similar at baseline to clients not receiving the magic bundle.

Figures 6 and 7 provide visual evidence that at each SparkPoint center, the baseline income and savings of clients who receive the magic bundle are similar to those of clients who do not receive the magic bundle. For each SparkPoint center, the top panel corresponds to magic-bundle clients and the bottom panel corresponds to non-magic-bundle clients. The large spike at the far left of each plot is due to the large number of clients reporting zero baseline income or zero baseline savings. Though not shown, baseline debt and credit scores are also similar for clients receiving and not receiving the magic bundle.

Figure 6: Distribution of baseline income for clients receiving vs. not receiving the magic bundle, across 8 SparkPoint centers (Plaza Adelante excluded).
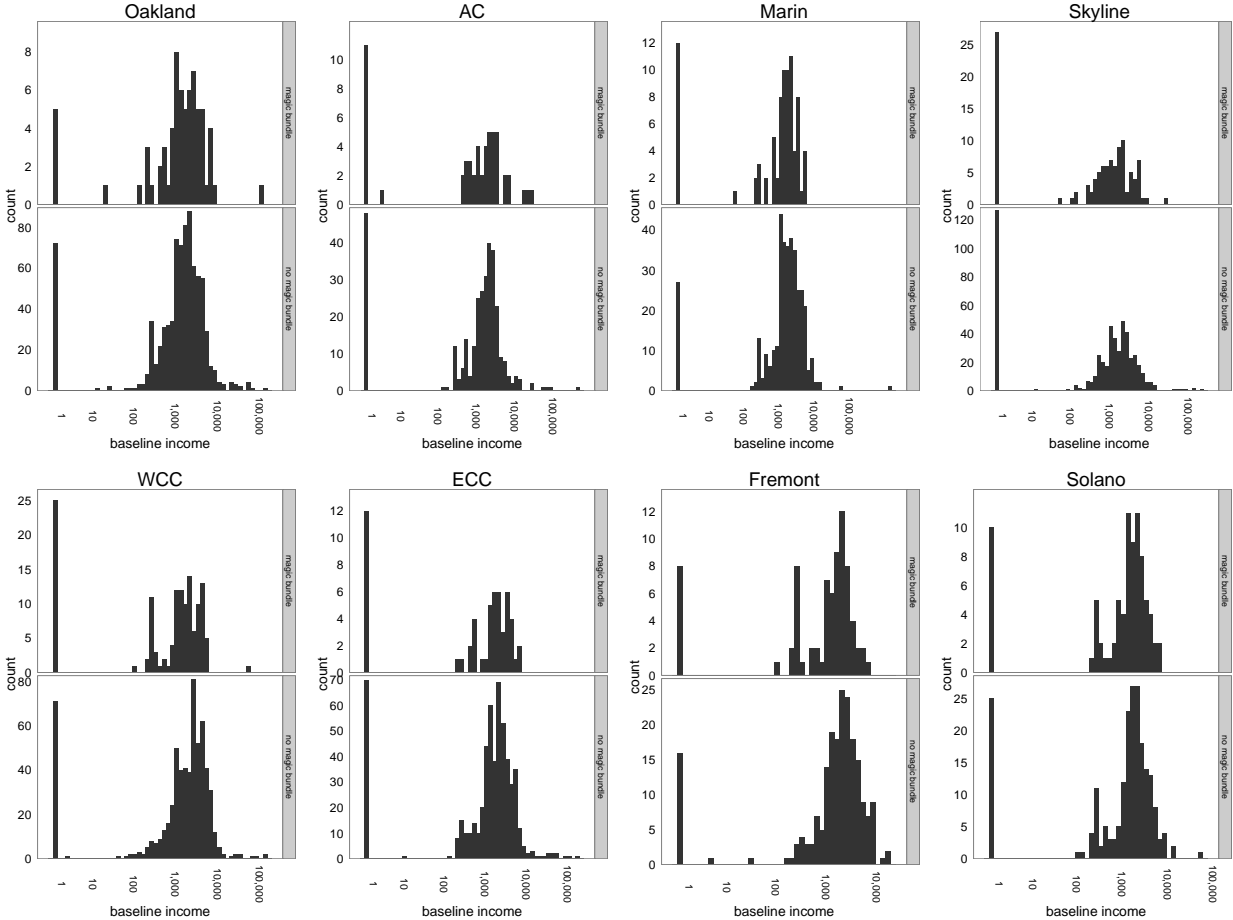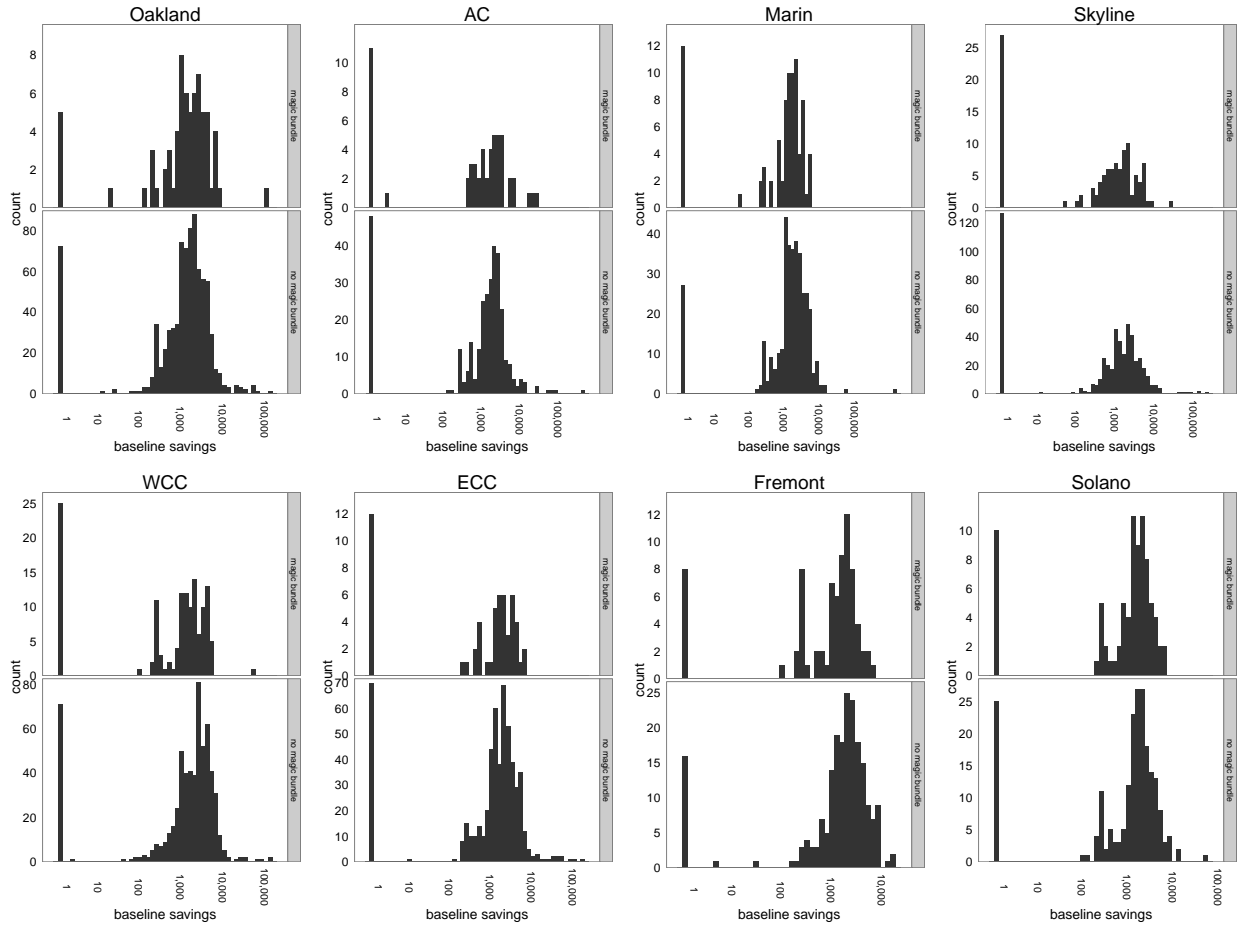
Figure 7: Distribution of baseline savings for clients receiving vs. not receiving the magic bundle, across 8 SparkPoint centers (Plaza Adelante excluded).

The similarity of baseline characteristics between magic-bundle and non-magic-bundle clients is reassuring. However, there are two respects in which these clients differ at baseline.

First, at nearly all SparkPoint centers, clients who do not receive the magic bundle are much more likely to have missing information on their baseline assessment form. As Table 3 indicates, the percentage of missing values for baseline savings and expenses is higher for non-magic-bundle clients at all centers except Fremont, where magic-bundle clients are more likely to be missing baseline expenses. Moreover, the magnitude of the disparity can be quite large: in West Contra Costa, clients who receive the magic bundle have 0% missing baseline savings, whereas clients who do not receive the magic bundle have 21% missing baseline savings.

This phenomenon may occur because clients who are more forthcoming when filling out the baseline assessment are also more likely to be active participants in SparkPoint services, or it may be a consequence of the way that SparkPoint recommends services to clients on the basis of the baseline assessment. We have not attempted to impute the missing baseline values, and instead we limit ourselves to comparing clients whose relevant baseline characteristics are not missing.

| | Missing Savings | | Missing Expenses | |
Center	bundle	no bundle	bundle	no bundle
SparkPoint American Canyon	28%	40%	41%	50%
SparkPoint East Contra Costa - Bay Point	0%	10%	5%	25%
SparkPoint Fremont	7%	15%	34%	22%
SparkPoint Marin	0%	9%	1%	14%
SparkPoint Oakland	4%	32%	9%	38%
SparkPoint Skyline	0%	1%	3%	5%
SparkPoint Solano	10%	23%	17%	36%
SparkPoint West Contra Costa - Richmond	0%	21%	2%	24%

Table 3: Percentage of clients with missing baseline savings and expenses, by center and by magic bundle participation.

Second, clients who receive the magic bundle are also more likely to receive other SparkPoint services. Decrease Debt, Increase Credit, and Obtain Benefits are popular services that do not form part of the magic bundle, but as Figure 8 illustrates, clients who receive the magic bundle also receive these services with much greater frequency.

This phenomenon is reasonably intuitive: clients who are active participants in the services constituting the magic bundle are also likely to seek out other SparkPoint services. From an analysis point of view, this poses a challenge because if we observe that clients receiving the magic bundle have superior progress toward long-term outcomes, the superior progress could be attributable to other services besides the magic bundle itself. We addressed this issue in our analysis by trying out regression models which include both the magic bundle and other services as predictor variables. In most cases, we found that the estimated effect of the magic bundle was not sensitive to the inclusion of other services as predictor variables.
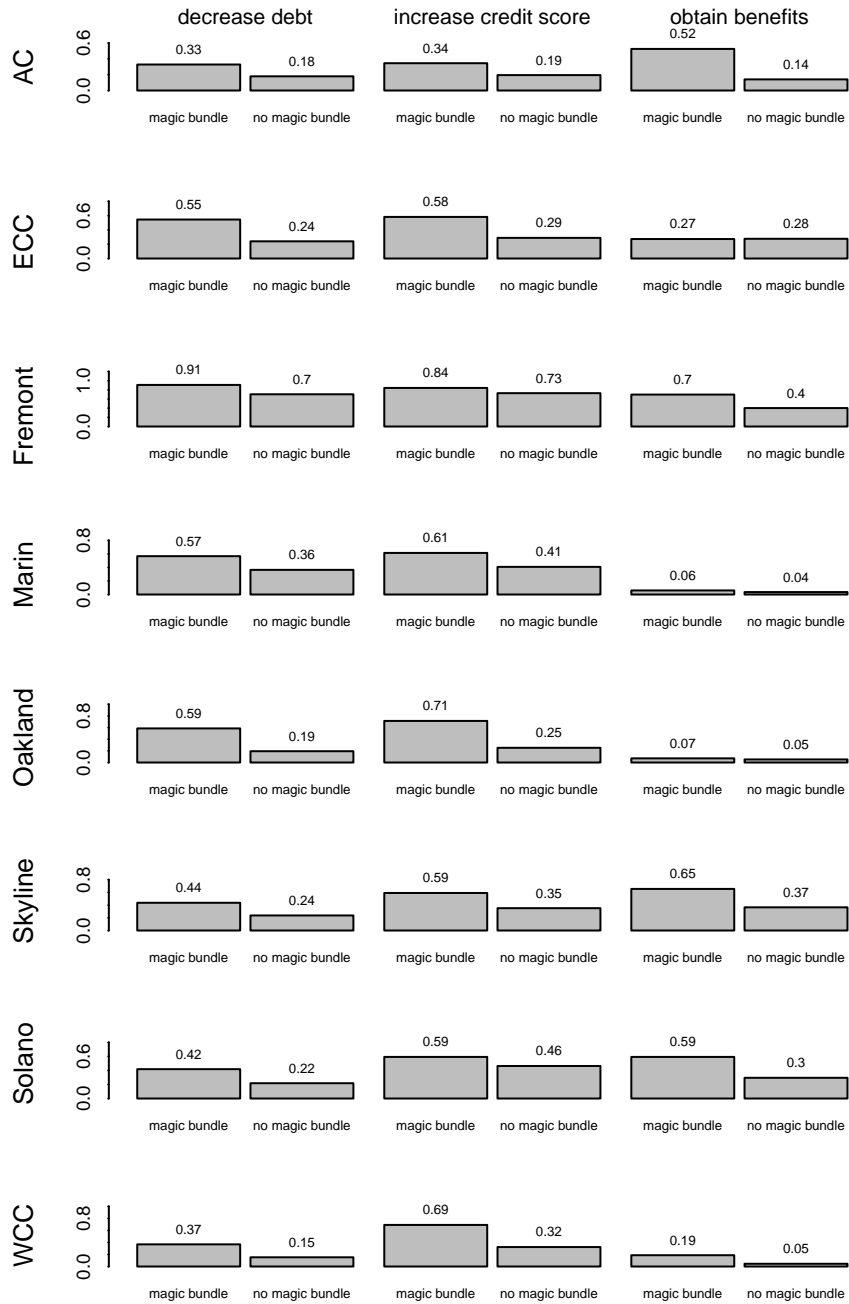
Figure 8: Percentage of clients receiving the services Decrease Debt, Increase Credit Score, and Obtain Benefits, by center and by magic bundle participation.

In the remainder of Section 2, we examine each of the four SparkPoint long-term outcomes in turn, comparing the progress of magic-bundle clients to that of non-magic-bundle clients.

2.3 Achieving DTI ≤ 40%

For each SparkPoint center, Figure 9 shows a scatterplot of clients' baseline and follow-up DTI ratios. Clients receiving the magic bundle are plotted as red triangles. Both axes are plotted on the logarithmic scale for ease of viewing, and extreme outliers have been removed. Each plot includes a horizontal dashed line at 40%; successful clients are those who fall below the horizontal dashed line. Each plot also includes a sloped dashed line, which corresponds to no change between baseline and follow-up. All points falling below the sloped dashed line are clients who have made progress toward the outcome between baseline and follow-up. The farther a point falls below the sloped dashed line, the more progress the client has made.
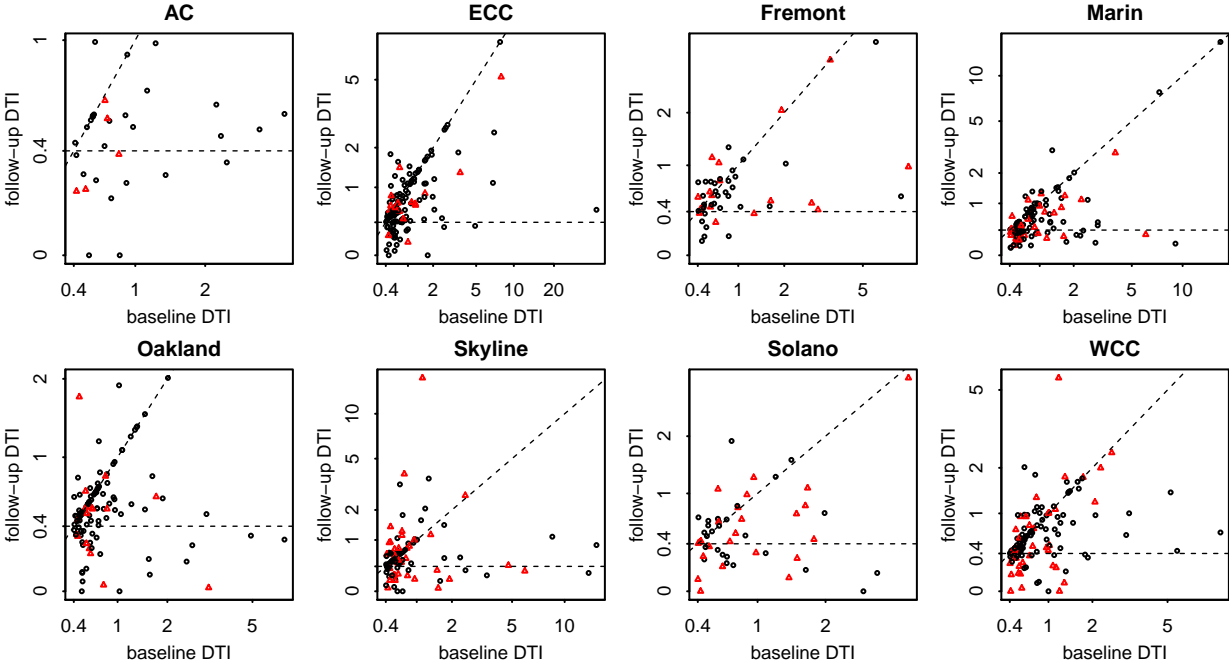

Figure 9: DTI at follow-up versus at baseline, on log scale, for clients receiving the magic bundle (red triangles) and not (black circles). Points falling below the horizontal dashed line are successful clients for the "DTI ≤ 40%" outcome. Points falling below the sloped dashed line are clients who have made progress toward the outcome.

Qualitatively, by inspection of Figure 9, it appears that the majority of clients at each center fall below the sloped dashed line, indicative of positive progress toward the long-term outcome.

Comparing the red triangles to the black circles is more difficult to do by visual inspection. To investigate whether there are consistent differences in the progress made by magic-bundle clients and non-magic-bundle clients, we fit a linear regression model to each center's data. We fit a basic

model which predicts follow-up DTI using baseline DTI (horizontal axis in Figure 9) and magic-bundle status (color of points in Figure 9). Since DTI is a ratio quantity, the raw DTIs are highly skewed, so we transform DTI to $\log(1 + \text{DTI})$ as in Figure 9. The model is

$$\log(1 + \text{follow-up DTI}) = \beta_0 + \beta_1 \cdot \log(1 + \text{baseline DTI}) + \beta_2 \cdot (\text{receive magic bundle}) + \text{error}$$

where "receive magic bundle" is 1 for magic-bundle clients and 0 for non-magic-bundle clients. The interpretations of β_1 and β_2 are as follows:

- If β_1 is positive, then for both magic-bundle clients and non-magic-bundle clients, a higher baseline DTI is associated with a higher follow-up DTI. Based on Figure 9, there is a strong positive association between baseline DTI and follow-up DTI, so we expect β_1 to be positive for all centers.

- If β_2 is positive, then magic-bundle clients have a higher predicted follow-up DTI than non-magic-bundle clients, which means magic-bundle clients make *less* progress toward the long-term outcome than non-magic-bundle clients with the same DTI at baseline. If β_2 is negative, then magic-bundle clients make *more* progress toward the long-term outcome than non-magic-bundle clients with the same baseline.

Table 4 shows fitted values of β_1 and β_2 (second and fourth columns, respectively) and p-values for β_1 and β_2 (third and fifth columns, respectively) after applying this model to each site separately. We note that β_1, the coefficient of $\log(1 + \text{baseline DTI})$, is consistently positive, which is in line with our expectations. On the other hand, β_2, the coefficient of (receive magic bundle), is not consistently positive or negative, and the large p-values indicate that our estimates are very noisy and unstable.

Center	$\log(1 + \text{baseline DTI})$	p	(receive magic bundle)	p
SparkPoint American Canyon	0.077	0.413	-0.014	0.69
SparkPoint East Contra Costa	0.374	0.000	0.013	0.70
SparkPoint Fremont	0.315	0.000	0.007	0.83
SparkPoint Marin	0.528	0.000	-0.021	0.43
SparkPoint Oakland	0.049	0.468	-0.025	0.30
SparkPoint Skyline	0.069	0.433	0.035	0.33
SparkPoint Solano	0.246	0.058	0.010	0.76
SparkPoint West Contra Costa	0.331	0.000	-0.002	0.94

Table 4: DTI regression model. Estimated regression coefficients and p-values for the model $\log(1 + \text{follow-up DTI}) = \beta_0 + \beta_1 \cdot \log(1 + \text{baseline DTI}) + \beta_2 \cdot (\text{receive magic bundle}) + \text{error}$.

More complicated regression models yielded improved fits, as measured by adjusted R^2 values, but none produced a consistent effect for (receive magic bundle) across centers.

2.4 Achieving credit score ≥ 650

Figure 10 shows scatterplots of TransUnion credit scores at baseline and at follow-up; a single outlier with a baseline credit score of 300 has been removed. Magic-bundle clients are plotted as

red triangles. A sloped dashed line is drawn at the 45-degree line, corresponding to no change between baseline and follow-up. The farther a point lies above the sloped line, the more the client's TransUnion credit score has improved.

A horizontal dashed line is drawn at 650, but note that unlike the previous scatterplots for DTI, there is only an approximate correspondence between falling above the horizontal line and achieving the "credit score ≥ 650" outcome, because in accordance with the definition in the Successful SparkPoint Clients Analysis report, the "credit score ≥ 650" outcome is achieved if *at least* one credit score is below 650 at baseline and *at least* one credit score is ≥ 650 at follow-up. Here we plot TransUnion credit scores only in order to compare apples to apples.
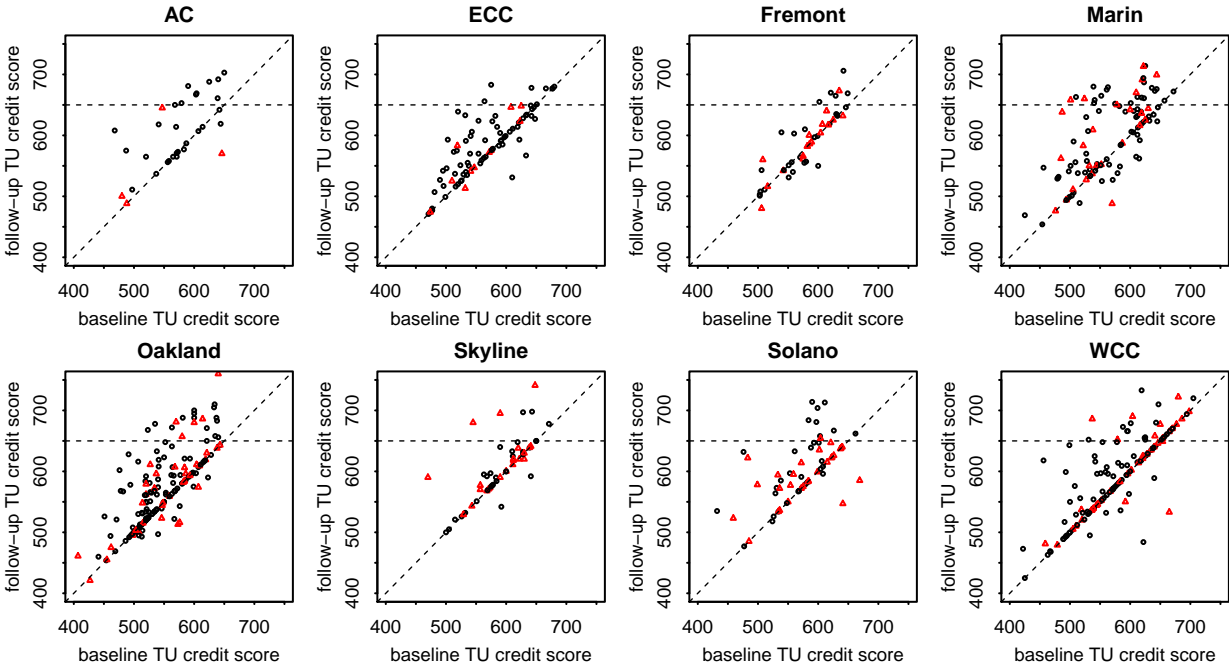

Figure 10: TransUnion credit scores at follow-up versus at baseline, for clients receiving the magic bundle (red triangles) and not (black circles). Points falling above the horizontal dashed line approximately correspond to successful clients for the "credit score ≥ 650" outcome. Points falling above the sloped dashed line are clients whose TransUnion credit scores improved from baseline to follow-up.

The vast majority of clients fall on the sloped line or above it, which means their TransUnion credit scores have either stayed the same or increased. Again we can ask whether magic-bundle clients have greater gains in credit scores than non-magic-bundle clients with the same baseline credit score. We fit the model

(follow-up TU credit score) $= \beta_0 + \beta_1 \cdot$ (baseline TU credit score) $+ \beta_2 \cdot$ (receive magic bundle) $+$ error

where "receive magic bundle" is 1 for magic-bundle clients and 0 for non-magic-bundle clients.

- If β_1 is positive, then for both magic-bundle clients and non-magic-bundle clients, a higher

baseline credit score is associated with a higher follow-up credit score. We expect β_1 to be positive for all centers. The exact value of β_1 can be interpreted as follows: for both magic-bundle clients and non-magic bundle clients, an increase of 1 point in the baseline credit score is associated with an expected increase of β_1 points in the follow-up credit score.

- If β_2 is positive, then magic-bundle clients have a higher predicted follow-up credit score than non-magic-bundle clients, which means magic-bundle clients make *more* progress toward the long-term outcome than non-magic-bundle clients with the same TransUnion credit score at baseline. If β_2 is negative, then magic-bundle clients make *less* progress toward the long-term outcome than non-magic-bundle clients with the same baseline. The exact value of β_2 also has a simple interpretation: a client who receives the magic bundle has a follow-up credit score that is β_2 points higher on average than a client who does not receive the magic bundle and starts out with the same baseline credit score.

Table 5 shows fitted values of β_1 and β_2 (second and fourth columns, respectively) and p-values for β_1 and β_2 (third and fifth columns, respectively). We note that β_1, the coefficient of (baseline credit score), is consistently positive: a client's baseline credit score is a very strong predictor of his or her follow-up credit score. On the other hand, β_2, the coefficient of (receive magic bundle), is not consistently positive or negative, and the large p-values indicate that our estimates are very noisy and unstable, as was the case for the DTI outcome.

Center	(baseline TU credit score)	p	(receive magic bundle)	p
SparkPoint American Canyon	0.765	0.001	17.1	0.61
SparkPoint East Contra Costa	0.870	0.000	−5.6	0.59
SparkPoint Fremont	1.061	0.000	−5.0	0.50
SparkPoint Marin	0.795	0.000	9.1	0.39
SparkPoint Oakland	0.839	0.000	2.7	0.73
SparkPoint Skyline	0.876	0.000	15.1	0.11
SparkPoint Solano	0.729	0.000	−25.5	0.03
SparkPoint West Contra Costa	0.868	0.000	−7.3	0.32

Table 5: Credit-score regression model. Estimated regression coefficients and p-values for the model (follow-up TU credit score) $= \beta_0 + \beta_1 \cdot$ (baseline TU credit score) $+ \beta_2 \cdot$ (receive magic bundle) $+$ error.

We also fit more complicated models that included additional baseline characteristics and additional services received, but we found that once the baseline credit score is accounted for, these additional variables do not contribute significant explanatory power.

2.5 Achieving self-sufficient income

We define "distance to self-sufficiency" as

(distance to self-sufficiency) = (monthly self-sufficiency standard) − (total monthly income).

This is positive at baseline for all potential achievers because their monthly income falls short of the self-sufficiency standard. For successful clients, the distance to self-sufficiency is negative at the most recent follow-up.

Figure 11 plots clients' distance to self-sufficiency at follow-up versus at baseline; extreme outliers have been removed. Successful clients are those who fall below the horizontal dashed line at 0. Clients falling below the sloped dashed line have made progress toward the outcome between baseline and follow-up, and clients falling below the horizontal dashed line have achieved the outcome. At each center, the majority of clients are closer to the self-sufficiency standard at follow-up than at baseline.
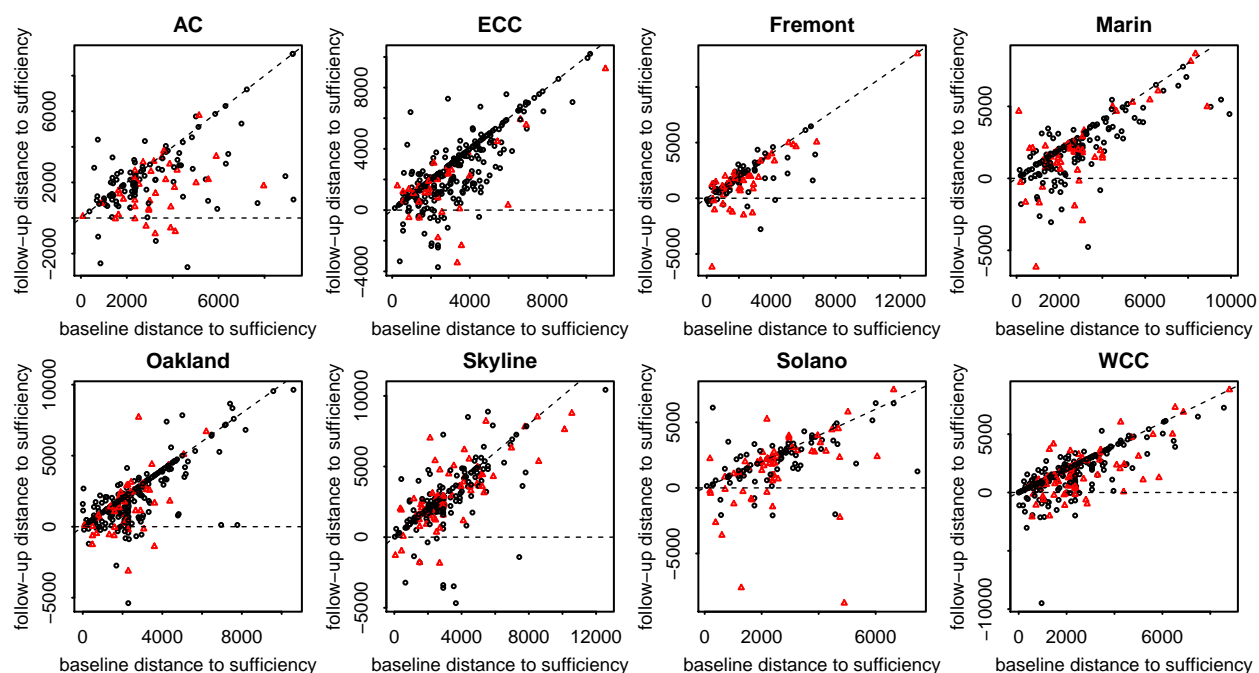

Figure 11: Distance to self-sufficiency at follow-up versus at baseline, for clients receiving the magic bundle (red triangles) and not (black circles). Points falling below the horizontal dashed line are successful clients for the "self-sufficient income" outcome. Points falling below the sloped dashed line are clients who have made progress toward the outcome.

Our basic regression model predicts follow-up distance to self-sufficiency using baseline distance to self-sufficiency (horizontal axis in Figure 11) and magic-bundle status (color of points in Figure 11):

$$(\text{follow-up distance to self-sufficiency}) = \beta_0 + \beta_1 \cdot (\text{baseline distance to self-sufficiency})$$
$$+ \beta_2 \cdot (\text{receive magic bundle}) + \text{error}$$

where "receive magic bundle" is 1 for magic-bundle clients and 0 for non-magic-bundle clients.

- If β_1 is positive, then for both magic-bundle clients and non-magic-bundle clients, a higher baseline distance to self-sufficiency is associated with a higher follow-up distance to self-sufficiency. We expect β_1 to be positive for all centers. The exact value of β_1 can be interpreted as follows: for both magic-bundle clients and non-magic bundle clients, an increase of \$100 in the baseline distance to self-sufficiency is associated with an expected increase of \$$(100 \times \beta_1)$ in the follow-up distance to self-sufficiency.

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- If β_2 is positive, then magic-bundle clients have a higher predicted distance to self-sufficiency than non-magic-bundle clients, which means magic-bundle clients make *less* progress toward the long-term outcome than non-magic-bundle clients with the same baseline distance to self-sufficiency. If β_2 is negative, then magic-bundle clients make *more* progress toward the long-term outcome than non-magic-bundle clients with the same baseline. The exact value of β_2 can be interpreted as follows: a client who receives the magic bundle has a follow-up distance to self-sufficiency that is β_2 points higher on average than a client who does not receive the magic bundle and starts out with the same baseline distance to self-sufficiency.

Table 6 shows fitted values of β_1 and β_2 (second and fourth columns, respectively) and p-values for β_1 and β_2 (third and fifth columns, respectively). As expected, all coefficients β_1 are positive and highly significant, because a client's baseline distance to self-sufficiency is strongly and positively correlated with his or her follow-up distance to self-sufficiency.

With the exception of SparkPoint Skyline, all coefficients β_2 are negative; thus, a consistent trend across centers is that clients who receive the magic bundle make more progress toward the outcome. This effect is particularly strong at SparkPoint American Canyon and SparkPoint East Contra Costa. At American Canyon, clients who receive the magic bundle have a follow-up distance to sufficiency that is \$722 lower on average than clients who don't receive the magic bundle and start with the same distance to sufficiency; at East Contra Costa, the effect is \$656.

Center	(baseline distance to self-suff.)	p	(receive magic bundle)	p
SparkPoint American Canyon	0.479	0.000	-721.7	0.014
SparkPoint East Contra Costa	0.901	0.000	-656.2	0.012
SparkPoint Fremont	0.848	0.000	-213.2	0.373
SparkPoint Marin	0.792	0.000	-153.8	0.499
SparkPoint Oakland	0.864	0.000	-256.3	0.188
SparkPoint Skyline	0.792	0.000	92.2	0.632
SparkPoint Solano	0.643	0.000	-622.0	0.052
SparkPoint West Contra Costa	0.899	0.000	-347.1	0.030

Table 6: Self-sufficient-income regression model. Estimated regression coefficients and p-values for the model (follow-up distance to self-suff.) $= \beta_0 + \beta_1 \cdot$ (baseline distance to self-suff.) $+ \beta_2 \cdot$ (receive magic bundle) $+$ error.

However, as we noted in Section 2.2, magic-bundle clients are also more frequently the recipients of other services besides the magic bundle. Thus, in order to check that the superior progress of magic-bundle clients isn't attributable to the fact that magic-bundle clients are receiving other beneficial services, we fit a larger model which includes the treatments Increase Credit Score and Obtain Benefits, as well as baseline self-sufficiency standard:

$$\text{(follow-up distance to self-sufficiency)} = \beta_0 + \beta_1 \cdot \text{(baseline distance to self-sufficiency)}$$
$$+ \beta_2 \cdot \text{(receive magic bundle)}$$
$$+ \beta_3 \cdot \text{(baseline self-sufficiency standard)}$$
$$+ \beta_4 \cdot \text{(receive Increase Credit Score)}$$
$$+ \beta_5 \cdot \text{(receive Obtain Benefits)} + \text{error.}$$

where "receive Increase Credit Score" is 1 or 0 depending on whether or not the client received the service Increase Credit Score, and similarly for "receive Obtain Benefits".

In the simpler model, β_2 represented the expected difference in progress between a magic-bundle client and a non-magic-bundle client who share the same baseline distance to self-sufficiency. In the augmented model, β_2 represents the expected difference in progress between a magic-bundle client and a non-magic-bundle client who share the same baseline distance to self-sufficiency, the same baseline self-sufficiency standard, and the same values of "receive Increase Credit Score" and "receive Obtain Benefits".

The estimated values of β_2 under the larger model are compared to the ones from the reduced model in Table 7. We see that the sign, magnitude, and significance of the coefficients remain stable under the larger model. We found that this was the case under several alternative model specifications as well.

Center	β_2, basic model	p	β_2, augmented model	p
SparkPoint American Canyon	-721.7	0.014	-746.7	0.013
SparkPoint East Contra Costa	-656.2	0.012	-716.0	0.007
SparkPoint Fremont	-213.2	0.373	-165.8	0.517
SparkPoint Marin	-153.8	0.499	-134.0	0.558
SparkPoint Oakland	-256.3	0.188	-269.2	0.171
SparkPoint Skyline	92.2	0.632	50.7	0.795
SparkPoint Solano	-622.0	0.052	-476.4	0.159
SparkPoint West Contra Costa	-347.1	0.030	-283.8	0.089

Table 7: Self-sufficient-income regression model. Estimated regression coefficient of "receive magic bundle" under basic model and under augmented model.

In summary, the data support the claim that magic-bundle clients make more progress toward self-sufficient income than non-magic-bundle clients, especially at American Canyon and East Contra Costa, where the effect size is around $700.

2.6 Achieving savings $\geq$ three months' expenses

We define "distance to 3m" as

$$\text{(distance to 3m)} = 3 \times \text{(total monthly expenses)} - \text{(total savings).}$$

This is positive at baseline for all potential achievers because their total savings are less than three times their monthly expenses. For successful clients, the distance to 3m is negative at the most recent follow-up.

Figure 12 plots clients' distance to 3m at the most recent follow-up versus at baseline. Clients receiving the magic bundle are plotted as red triangles. Extreme outliers have been removed. Successful clients are those who fall below the horizontal dashed line at 0. Clients falling below the sloped dashed line have made progress toward the outcome between baseline and follow-up.
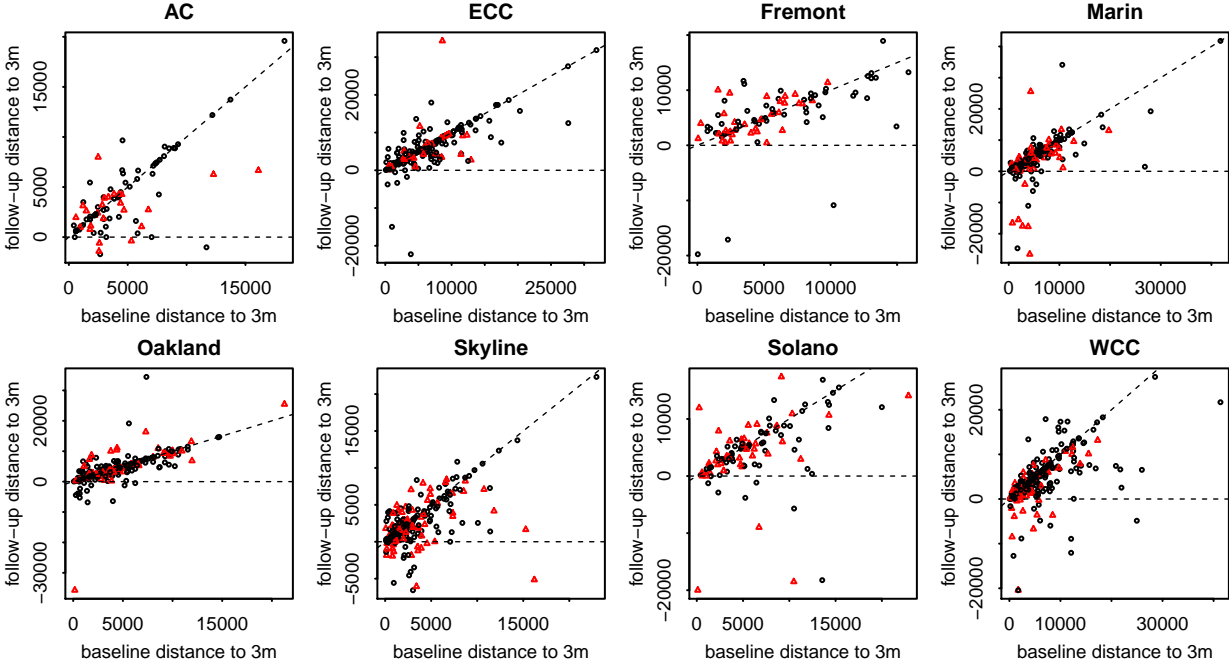

Figure 12: Distance to 3m at follow-up versus at baseline, for clients receiving the magic bundle (red triangles) and not (black circles). Points falling below the horizontal dashed line are successful clients for the "savings $\geq$ 3 months' expenses" outcome. Points falling below the sloped dashed line are clients who have made progress toward the outcome.

Qualitatively, it appears to be more difficult to make progress toward this outcome. For the other three outcomes, the majority of clients made positive progress and are closer to achieving the outcome at follow-up than at baseline. For this outcome, there are many clients who are farther away from achieving the outcome at follow-up than at baseline, as evidenced by the many points falling above the sloped lines.

In our basic regression model, we predict follow-up distance to 3m using baseline distance to 3m and receipt of the magic bundle:

(follow-up distance to 3m) = $\beta_0 + \beta_1 \cdot$ (baseline distance to 3m) $+ \beta_2 \cdot$ (receive magic bundle) + error

where "receive magic bundle" is 1 for magic-bundle clients and 0 for non-magic-bundle clients. The interpretations of β_1 and β_2 are as follows:

- If β_1 is positive, then for both magic-bundle clients and non-magic-bundle clients, a higher baseline distance to 3m is associated with a higher follow-up distance to 3m.

- If β_2 is positive, then magic-bundle clients have a higher predicted follow-up distance to 3m than non-magic-bundle clients, which means magic-bundle clients make *less* progress toward the long-term outcome than non-magic-bundle clients with the same distance to 3m at baseline. If β_2 is negative, then magic-bundle clients make *more* progress toward the long-term outcome than non-magic-bundle clients with the same baseline.

Table 8 shows fitted values of β_1 and β_2 (second and fourth columns, respectively) and p-values for β_1 and β_2 (third and fifth columns, respectively). As with the previous outcomes, the baseline distance to 3m is a strong positive predictor of the follow-up distance to 3m. On the other hand, the impact of the magic bundle is ambiguous, with mild evidence of an effect at American Canyon, Marin, and West Contra Costa, and no evidence of an effect at the remaining centers. At American Canyon, a client who receives the magic bundle has a follow-up distance to 3m that is \$962 lower on average than a client who does not receive the magic bundle and starts with the same baseline distance to 3m; the corresponding figures at Marin and West Contra Costa are \$1930 and \$1152. These figures remain essentially unchanged when additional baseline variables and services are included as predictors in the model.

Center	(baseline distance to 3m)	p	(receive magic bundle)	p
SparkPoint American Canyon	0.720	0.000	−962.5	0.097
SparkPoint East Contra Costa	0.830	0.000	540.8	0.468
SparkPoint Fremont	0.787	0.000	1004.4	0.342
SparkPoint Marin	0.865	0.000	−1930.4	0.031
SparkPoint Oakland	1.040	0.000	−175.9	0.728
SparkPoint Skyline	0.633	0.000	−496.9	0.191
SparkPoint Solano	0.558	0.000	−177.0	0.866
SparkPoint West Contra Costa	0.578	0.000	−1152.4	0.073

Table 8: Regression model for distance to 3m. Estimated regression coefficients and p-values for the model (follow-up distance to 3m) $= \beta_0 + \beta_1 \cdot$(baseline distance to 3m)$+ \beta_2 \cdot$(receive magic bundle)$+$ error.