

Supporting Materials for Stewart (2009)

Neil Stewart
University of Warwick

In a survey of credit card repayments, Stewart (2009) found that lower minimum payments are associated with lower actual repayments. In a subsequent hypothetical repayment experiment, Stewart (2009) found that omitting minimum payments from a mock credit card statement increased the size of repayments people made. In these supporting materials I show that there is good agreement between the distributions of repayments found in the survey, in the experiment, and in the real world. I also present a second analysis of the experimental data which shows that including minimum payment information affects all levels of repayment. Finally, I estimate the cost of anchoring on minimum payments.

The Distribution of Repayments in the Experiment Matches Those from the Survey

There is good agreement between the data collected from actual credit card statements in the survey and the hypothetical repayments people made in the experiment. Table 1 shows the proportion of people making minimum, part, and full repayments in the survey and in each experimental condition.

Table 1
Proportion Making Different Categories of Payment

Payment	Survey	Experiment	
		Minimum payment included	Minimum payment omitted
Minimum	7%	6%	-
Part	36%	39%	45%
Full	58%	55%	55%

Comparison between the survey data (for those who reported minimum payments) and experiment data (which was collected from a different set of participants) show that people's hypothetical payment decisions in the experiment match the real-world data from the survey very closely. It seems people took the hypothetical repayment task seriously as the repayments generated were very similar to the real-world repayments.

Figure 1 plots the cumulative density function (CDF) for the distribution of payments from the survey and the experiment. (The information in Table 1 is a summary of these data). CDFs were chosen to present the full detail of the distributions without smoothing or binning. The distributions of partial repayments in the survey and in the Minimum Payment Condition of the experiment match quite well. This is



Figure 1. The cumulative distribution of repayments in the survey and the experiment.

the most obvious comparison, as participants contributing to these two distributions were both presented with minimum payment information. There is a tendency for minimum payments to be a smaller proportion of the outstanding balance in the survey, which is most likely because, on average, balances were larger in the survey (mean = £1,284) than the hypothetical value of £435.76 in the experiment.

The Results of the Experiment (and the Survey) Agree with Industry Statistics

The proportions reported in Table 1 for the survey and the experiment also agree well with those reported by the industry regulator in their survey of credit card users. The Office of Fair Trading (2004) reported 47% repaying the whole balance (a slightly lower proportion than the survey and experiment, but repayment rates have increased historically from 2004 to 2007-08). 8% make only the minimum payment (matching the survey and the experiment), with 12% reporting they "pay over the minimum payment when possible",

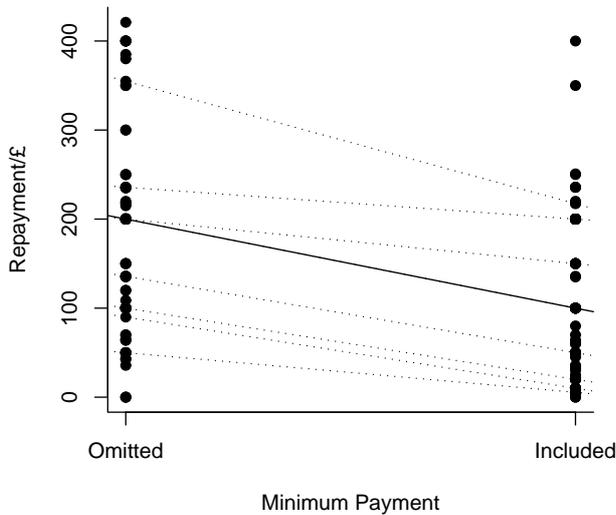


Figure 2. Quantile regression for the experiment data. Points represent individual repayments (often overlapping at round values). The solid line represents how the median changes and the dotted lines represent how the other deciles change.

13% reporting they “sometimes let the balance role to the next month”, and 18% making a partial repayment. APACS, the UK body representing credit card companies, independently report that just over half of people repay their balance in full each month (personal communication, 15 July, 2008).

Minimum Payments Affect All Making Part Repayments

Minimum payments affect not just those making payments at or near the minimum payment, but everyone who makes a partial repayment. Figure 2 re-plots the data from Experiment 1. The lines represent the results of the quantile regressions (Koenker & Hallock, 2001). The solid line represents the median and dotted lines represent the other deciles. Quantile regression is similar to linear regression, but shows how a particular quantile, rather than the mean, varies with the independent variable. The downward slopes of the lines show that the median and all other deciles are reduced when minimum payment information is included. t-tests on the slopes of each line show all to have significant slope. Including minimum payment information affects all levels of repayment and not, for example, just the mean repayment or just small repayments.

The Cost of Anchoring on Minimum Payments

Figure 3 plots (in ranks) the partial repayments from the survey (as a proportion of the balance) as a function of the

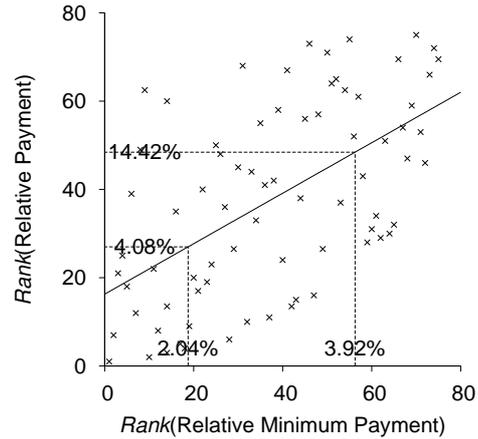


Figure 3. Rank relative payment as a function of rank minimum payment. The solid line is the best fitting regression line. The dashed lines map the first and third quartile minimum payments onto best estimates of the corresponding repayments. Percentages on the figure are relative minimum payments (against the x axis) and relative payments (against the y axis).

minimum payment (as a proportion of the balance). The dotted line indicates the best-fitting regression line. The dashed lines indicate the best estimates of the actual repayments associated with the first and third quartile minimum repayments. A first quartile minimum payment of 2.04% is associated with a repayment of 4.08% of the outstanding balance. The third quartile minimum payment of 3.92% is associated with a repayment of 14.42% of the outstanding balance.

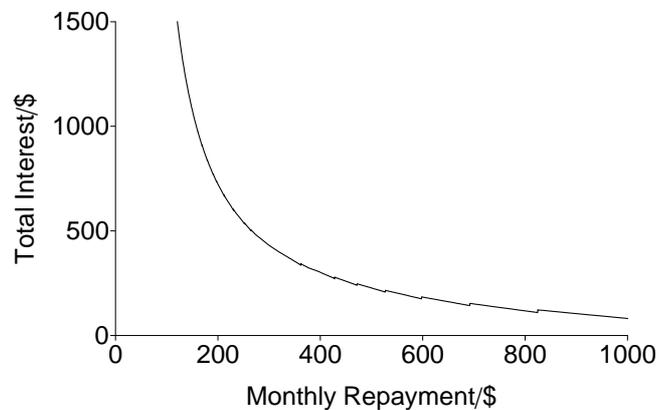


Figure 4. Total interest charged plotted as a function of monthly repayment for a typical loan of \$4,000 with an APR of 20%.

Figure 4 plots the total interest charged over the life of a typical \$4,000 loan with a typical 20% APR. For low repayments interest charges are very high. Small increased in low repayments have a dramatic effect. Monthly repayments of 4.08% (\$193) lead to an interest charge of \$762 over the 25-month lifetime of the debt. But monthly repayments of 14.42% (\$570) lead to an interest charge of only \$197 over the now only 8-month lifetime of the debt. So a roughly 2%

increase in minimum payment is associated with a four-fold reduction in interest charged. Because of the curvature of Figure 4, variations in larger repayments will have a smaller effect on interest charged.

References

- Koenker, R., & Hallock, K. F. (2001). Quantile regression. *Journal of Economic Perspectives*, *15*, 143–156.
- Office of Fair Trading. (2004, March). *Credit card survey*. Office of Fair Trading.
- Stewart, N. (2009). The cost of anchoring on credit card minimum payments. *Psychological Science*, *20*, 39–41.