1086-05-1676 **Ameera N Chowdhury*** (chowdhury@math.ucla.edu). *The Manickam-Miklós-Singhi Conjecture for Small $k$.* Preliminary report.

For a positive integer $k$, let $f(k)$ be the minimum integer $N$ such that for all $n \geq N$, every set of $n$ real numbers with nonnegative sum has at least $\binom{n-1}{k-1}$ $k$-element subsets whose sum is also nonnegative. In 1988, Manickam, Miklós, and Singhi proved that $f(k)$ exists and conjectured that $f(k) \leq 4k$. We prove $f(3) = 11$, $f(4) \leq 20$, $f(5) \leq 33$, and $f(6) \leq 48$, which improves previous upper bounds in these cases. The last two bounds were obtained jointly with Stephen Hartke and Derrick Stolee. With more patience, our arguments could yield improved upper bounds on $f(k)$ for larger $k$. Moreover, we show how our method could potentially yield a quadratic upper bound on $f(k)$. We end by discussing the vector space analog of the Manickam-Miklós-Singhi conjecture, about which we know distressingly little. (Received September 24, 2012)