Given a set of coprime positive integers $a_1, \ldots, a_n$, the Diophantine Frobenius Problem is the following classical problem in the frontier of number theory and discrete mathematics:

Find the largest positive integer $g$ for which the equation

$$x_1 a_1 + \ldots + x_n a_n = g$$

has no solution with $x_i \geq 0$.

In this talk we discuss how this famous problem is the glue that connects the apparently random string of words in the title. Along the way, we will discuss some of its history, applications and generalizations. In particular, we show how this problem can be used to help the American government to not only save $52.9$ million yearly but to also turn a modest profit in a specific area.

Lunch will be available to colloquium participants after the talk.