Economics of Commitment: Why Giving Away Some Freedom Makes Sense

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Abstract

In general, the more freedom we have, the better choices we can make, and thus, the better possible economic outcomes. However, in practice, people often artificially restrict their future options by making a commitment. At first glance, commitments make no economic sense, and so their ubiquity seems puzzling. Our more detailed analysis shows that commitment often makes perfect economic sense: namely, it is related to the way we take future gains and losses into account. With the traditionally assumed exponential discounting, commitment indeed makes no economic sense, but with the practically observed hyperbolic discounting, commitment is indeed often economically beneficial.

1 Formulation of the Problem

Case study: a simplified description. This study started with a situation which, at first glance, sounds very reasonable. To get to the gist of it and to avoid irrelevant details, we will describe a simplified version of this situation.

There are several Jewish congregations in El Paso. To coordinate their activities, these organizations form the Jewish Federation. To support its activities, each congregation collects money from its congregants. A certain agreed-upon portion of this money is given to the Federation.

The Federation's Board – which consists of representatives of different congregations – decides how to spend this money. Congregations submit proposals, and the Board decides which proposals to grant and to what extent. In making these decisions, the Board tries its best to make sure that the overall amount of grants given to each congregation is proportional to the amount that the congregation donated to the Federation's budget.

From the economic viewpoint, this is a problem. At first glance, this sounds like a reasonable and fair procedure. However, if one thinks about it from the economic viewpoint, this procedure does not seem to make much sense.

Each congregation pays a certain amount of the money to the Federation, and then gets approximately the same amount of money back. So why not spend it directly? Why do we need this complicated process in the first place? Why not reserve the Federation funding scheme only for emergencies or for unusual situations?

Not only this scheme seems to make no economic sense, it seems to make the situation worse for each congregation: when the original sum of money was the congregation's money, the congregation could spend it on whatever project it could think about (and to which the congregants would agree). However, now that the same amount of money has come through the Federation process, it comes as Federation grants. The congregation is no longer free to spend this money any way it wants: it can only spend it on the project that it originally proposed to the Federation.

So, the congregation got its own money back, but it lost freedom in spending this money: it cannot easily change its mind and spend this money on something else, it has to stick to the original plan.

So why would the congregations go to all this process? Why not keep most of the money to itself and spend it any way the congregation wants?

Commonsense explanation and other cases of commitment. A commonsense explanation is that the Federation scheme brings commitment. If a congregation simply wants to sponsor some future event – e.g., a concert or a conference, it can decide to allocate some funds for this event. But there is always a need of day-by-day funding: the building become shabby and may need maintenance, the air conditioning equipment wears out and does not work as well anymore, there is a desire to decorate the building, etc. When there is a minor project like this worth doing, and there is a pool of money available for some future event – it is tempting to take money from this future-event fund. As a result, often, the future-event funding drastically decreases – and the event never happens.

On the other hand, by signing to the Federation-based scheme, the congregation makes a commitment to spend the allocated money exclusively on the future event – this avoiding the temptation of spending this amount to pay for day-by-day operations.

Such a commitment procedures are ubiquitous. To avoid temptation, people make pledges to stick to their diets, to go to the gym, to save money for retirement – often agreeing on penalties if they violate this commitment. For example, a known advice for a politically involved person to stick to their diet or ro their exercise routine is to sign a check to an opposite political organization and give it to a trusted friend (or, better, a lawyer) with an instruction to send it when the check-signer stops dieting or exercising.

Remaining problem. From the commonsense viewpoint, the above explanation may be somewhat convincing, but from the economic viewpoint, it still

remains a mystery.

There is a lot of evidence that freedom of choice is good for a person (see, e.g., [6, 7] and references therein), so why would a person artificially restrict his/her freedom of choice?

What we do in this paper. In this paper, we provide an economic explanation for the benefits of commitment.

2 Our Explanation

Main idea: let us take discounting into account. Our explanation is based on the fact that when people make decisions, they take into account not only the amount of money (or whatever good) that they get at the given moment of time, they also take into account the future gains or losses – of course, with some discounting, so that \$1 in the future is valued less than \$1 right now.

Formally, let $m(t)$ denote the amount of money (or other goods) that a person (or an organization) gets at moment t. If the person only took into account the current gains – and ignored possible consequences – then a natural idea would be to select an action for which the current gain $m(t)$ is the largest possible. Let $D(t_0)$ denote the discounting of an event t_0 moments of time in the future, i.e., the amount of money now which is equivalent to \$1 at time t_0 in the future. In these terms, the overall gain from a given action is determined by the formula

$$m = m(t) + D(1) \cdot m(t+1) + D(2) \cdot m(t+2) + \ldots, \tag{1}$$

and we select an action for which this value m is the largest possible.

What discounting people use? If we place \$1 in the bank, where it will grow interest at a rate $r\%$, then after t_0 years, this amount will increase to a larger amount q^{t_0}, where $q \stackrel{\text{def}}{=} 1 + \dfrac{r}{100}$. To get \$1 at moment t_0, we thus need to invest the amount $\dfrac{1}{q^{t_0}} = q^{-t_0}$. From this viewpoint, \$1 at moment t_0 is equivalent to q^{-t_0} dollars right now. It therefore seems reasonable to take $D(t_0) = q^{-t_0}$.

This *exponential discounting* was indeed the original idea of decision theorists about how people make decisions. However, since the exponential function decrease to practically 0 fast, it would mean that people, in effect, ignore future consequences when making decisions. Such behavior happens – e.g., when a criminal robs a bank without thinking of future jail time or a young man takes heavy drugs without thinking of long-term damage to his brain – but luckily, such behavior is rare. Empirical data shows that when people make decisions, they use the formula

$$D(t_0) = \frac{1}{1 + k \cdot t_0} \tag{2}$$

known as *hyperbolic discounting*; see, e.g., [1, 2, 3, 4, 5, 8, 9, 10, 11].

Hyperbolic discounting explains economic efficiency of commitment. Let us show that taking hyperbolic discounting into account explains the economics advantages of commitment.

For simplicity, let us start counting time from the moment when we make the original decision, so that the original decision corresponds to moment $t = 0$. At this moment, we plan an event at moment t_E. We can gauge the positive consequences of this event by estimating the amount m_E that we were willing to pay to have this event right now – if we had the corresponding amount available right now.

Before this event, at some moment t_T, there is a *temptation* (e.g., desire to decorate the building). The negative affect of ignoring this temptation can also be gauged by the corresponding monetary amount; let us denote it by m_T. So, if we decide to keep the event and ignore the temptation, we thus get the equivalent amount

$$m = -D(t_T) \cdot m_T + D(t_E) \cdot m_E. \tag{3}$$

If we do not sponsor the event, then we do not get any gain at moment t_E but we also do not suffer any negative consequences at the moment t_T, so our overall effect is 0.

So, if the amount (3) is greater than 0, we decide to sponsor the event. For hyperbolic discounting (2), the inequality $m > 0$ means that

$$-m_T \cdot \frac{1}{1 + k \cdot t_T} + m_E \cdot \frac{1}{1 + k \cdot t_E} > 0, \tag{4}$$

i.e., equivalently, that

$$m_E \cdot (1 + k \cdot t_T) - m_T \cdot (1 + k \cdot t_E) > 0. \tag{5}$$

Formula (4) implies that $m_E > m_T$: otherwise, even with a larger discounting, the gain m_E would not outweigh the losses m_T.

If at this moment $t = 0$l, we make a commitment, we will sponsor the desired event. But suppose that we did not make this commitment. Then, in principle, when the time t_T of the temptation arrives, we can reconsider. At this time, we still prefer to hold the event if

$$-m_T + m_E \cdot \frac{1}{1 + k \cdot (t_E - t_T)} > 0,$$

i.e., if $m_E > m_T \cdot (1 + k \cdot (t_E - t_T))$. If $m_E < m_T \cdot (1 + k \cdot (t_E - t_T))$, we will be tempted to reconsider – and for a large difference $t_E - t_T$, the product $m_T \cdot (1 + k \cdot (t_E - t_T)_)$ is also large, so this inequality is quite possible. Thus, if we do not make a commitment, it is highly possible that we will reconsider and the desired event will not happen.

Thus, commitment indeed makes perfect economic sense.

Comment. Interestingly, the above argument only holds for the hyperbolic discounting. For exponential discounting, if the initial inequality

$$-q^{-t_T} \cdot m_T + q^{-t_E} \cdot m_E > 0 \tag{6}$$

is satisfied, then at every future moment t, multiplying both sides of inequality (6) by q^t, we get the new inequality

$$-q^{-(t_T-t)} \cdot m_T + q^{-(t_E-t)} \cdot m_E > 0$$

meaning that we should still be committed to holding the event.

Thus, the economics of commitment is based on the fact that our discounting is hyperbolic: for exponential discounting, there is no economic need for commitment.

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