

Since the engineering problem (brakes) has already been addressed, I'll cover a slight variation that covers the essential question.

Suppose you are somewhere in the desert--Arizona, say, or possibly New Mexico--and are chasing, say, a road-runner as you are simply famished. You plan to catch the roadrunner by throwing a large boulder onto its head from a cliff--but, as you are pushing the boulder over the edge (using a lever, naturally), the cliff breaks off. You finally push the boulder off to notice that the ledge you were on is falling down the *very* deep ravine.

Question: Is it to your advantage to jump off the bit of ledge remaining right before it hits the ground, so that you can cancel the speed of your fall and keep from being squashed flat?

Answer: Not unless you can jump hard enough. Let's assume, for the sake of simplicity, that the falling ledge with you on it reaches a terminal velocity (that is, the acceleration of gravity is exactly cancelled by the wind resistance, so it does not fall any faster) of about 50 meters per second. That means that you, too, are falling about 50 meters per second. To avoid getting smashed when you hit the ground you need to be going down at about 0 meters per second. So you need to jump up with a speed of about 50 meters per second.

So, unless you are able to jump hard enough to cover 50 meters—half the length of a football field--in one second; or, to put it another way, to (from rest) jump up 125 meters--more than the length of a football field--then you are going down too quickly to cancel out your velocity and save yourself.

Besides, even if you did, the boulder you pushed off would then smack you on the head, and it would be going about 50 meters per second, even if you held up a little umbrella to protect yourself.

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