

The Economic Landscape: How Economies Find Their Balance

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The Marble in the Bowl

Every introductory economics textbook draws supply and demand curves intersecting at an equilibrium price. But the picture is oddly static. It tells you *where* the economy ends up, not *why it gets there*. What pushes a market that is out of equilibrium back toward balance? What happens when there is more than one equilibrium?

Picture a marble in a bowl. Release it from the rim and it rolls downhill, oscillates, and comes to rest at the lowest point. The bowl's shape – steep or shallow, one valley or many – determines everything: how fast the marble moves, whether it overshoots, whether it gets stuck in a local dip instead of finding the deepest valley.

The CES potential gives the economy exactly this kind of landscape.

One Number for Every State

The *CES potential* assigns a single number Φ to every possible allocation of resources in the economy. If there are N sectors, each with a CES aggregate F_n , the potential is:

$$\Phi = - \sum_{n=1}^N \log F_n$$

Lower Φ means a better allocation. The economy naturally moves in the direction that reduces Φ – it rolls downhill.

Definition (CES Potential Landscape).

The function $\Phi = - \sum \log F_n$ defines a surface over the space of all possible allocations. Valleys (local minima) correspond to stable equilibria. Hilltops (local maxima) correspond to unstable states. Saddle points correspond to configurations that look stable if you push in one direction but collapse if you push sideways.

(Samuelson1947) showed that the existence of a potential function – a single scalar whose minimization characterizes equilibrium – is one of the deepest structural properties an economic system can have. Not every economic model admits one. The CES framework does, and this is what makes its dynamics tractable.

The Shape of the Landscape

What determines whether the bowl is deep or shallow? Two parameters: the curvature $K = (1 - \rho)(J - 1)/J$ from *Emergent CES*, and the information friction T from *The Economics of Not Knowing*.

High K (strong complementarity) means deep valleys. When inputs are strong complements, there is a large penalty for misallocation – the production function drops steeply as you move away from balanced inputs. The marble rolls back quickly when disturbed. The economy has strong self-correcting forces.

Low K (near-substitutes) means a shallow landscape. When inputs are easily interchangeable, misallocation barely matters. The marble barely rolls at all. The economy drifts, responding weakly to price signals.

Example.

Consider a hospital (strong complements: surgeons, anesthesiologists, nurses, equipment all needed together, $\rho \ll 0$). Misallocate one resource and output drops sharply. The landscape has a deep, narrow valley – the hospital has strong incentives to fix any imbalance quickly.

Now consider a commodity trading desk (near-substitutes: one barrel of oil is much like another, ρ close to 1). Misallocation barely affects output. The landscape is nearly flat – there is little urgency to rebalance.

A Two-Sector Economy

To make this concrete, imagine an economy with just two sectors: manufacturing (M) and services (S). The CES potential defines a surface over the space of possible allocations between them. At any point on this surface, the height tells you how far the economy is from optimal.

With strong complementarity ($\rho = -1$, so $K = 1$), the landscape has a single deep valley at the balanced allocation where both sectors receive their efficient share of inputs. Move resources away from manufacturing toward services (or vice versa), and Φ rises steeply. The economy feels a strong pull back to balance.

With weak complementarity ($\rho = 0.5$, so $K = 0.25$), the same landscape is much flatter. The valley is still there, but its walls are gentle slopes rather than cliffs. The economy can wander far from optimal allocation without much penalty – and therefore without much incentive to correct.

This difference directly affects adjustment speed. Deep valleys mean fast adjustment; shallow valleys mean slow adjustment. The curvature K is the restoring force of the economic system.

When the Landscape Flattens

Now introduce information friction T from *The Economics of Not Knowing*. Recall the *effectiveCurvature* K_{eff} : the exploitable curvature is $K_{\text{eff}} = K \cdot (1 - T/T^*)^+$. As T rises, effective curvature falls. In landscape terms: **rising information friction flattens the bowl**.

This is the single most important insight for understanding pre-crisis dynamics. Before a crisis, you often see a period where the economy seems stable but oddly unresponsive. Prices adjust slowly. Misallocations persist. Policymakers wonder why their interventions have so little effect.

The landscape explanation is straightforward: the bowl has become shallow. The marble is still sitting near the bottom, so the economy *appears* to be in equilibrium. But the walls of the valley have eroded. A small push that previously would have been corrected in weeks now takes months. A slightly larger push sends the marble over a ridge it could not have crossed before.

Theorem (Landscape Flattening).

As information friction T approaches the critical value T^* , the depth of equilibrium valleys decreases as $(1 - T/T^*)$. At $T = T^*$, the landscape becomes flat: all allocations yield the same potential, and the economy loses its self-correcting forces entirely.

This is pre-crisis behavior described geometrically. The economy has not yet moved to a bad state – but its ability to *resist* moving to a bad state has quietly evaporated.

Multiple Valleys and Regime Shifts

The landscape becomes richer when there is more than one valley. With multiple sectors and strong enough complementarity, the CES potential can have several local minima – each corresponding to a different stable configuration of the economy.

Think of a developing economy that could specialize in agriculture or manufacturing. Both are stable equilibria (valleys), but one valley is deeper. The economy might sit in the shallower valley for decades – agriculture works, institutions are adapted to it, there is no immediate reason to change.

But if a shock pushes the economy over the ridge separating the two valleys, it rolls into the deeper one. This is a regime shift: not a gradual transition but a sudden jump to a qualitatively different equilibrium. Once over the ridge, the landscape pulls the economy all the way to the new valley floor.

The height of the ridge between valleys – the **barrier** – depends on K_{eff} . High effective curvature means tall barriers and stable equilibria that resist perturbation. Low effective curvature means short barriers and an economy that can be tipped between regimes by modest shocks.

Early Warning: Reading the Landscape

If we could measure the shape of the landscape in real time, we could predict crises before they happen. We cannot observe Φ directly, but we can observe its consequences.

A deep valley produces fast adjustment: when the economy is perturbed, it snaps back quickly. A shallow valley produces slow adjustment: perturbations persist. This means that **slowing adjustment speed is a signal that the landscape is flattening** – that the economy is losing its self-correcting capacity.

Concretely, if the variance of economic indicators starts rising and their autocorrelation increases (shocks take longer to decay), the landscape is becoming shallower. These are measurable quantities, providing early warning without requiring anyone to identify the specific trigger.

The *adjustment dynamics* framework (see *Seeing Crises Before They Hit*) formalizes this: the relaxation rate at which perturbations decay is proportional to the curvature of Φ at the current equilibrium. Slower relaxation means less curvature means a flatter landscape means approaching crisis.

The Foundation of Everything That Follows

The landscape picture is simple – marbles rolling in bowls – but it organizes everything that follows. *Conservation Laws* describe quantities preserved as the marble rolls. The *hierarchical architecture* nests landscapes within landscapes, with slow outer bowls containing fast inner bowls.

The key ideas:

- The CES potential $\Phi = -\sum \log F_n$ assigns a single number to every economic state. Lower is better.
- The economy moves downhill on this landscape. Valleys are equilibria, ridges are tipping points.
- Curvature K controls the depth of valleys – strong complementarity means strong self-correction.
- Information friction T flattens the landscape, weakening self-correction and lowering the barriers between equilibria.
- Slowing adjustment speed is a measurable early warning that the landscape is losing its shape.

The landscape is the canvas. The next articles paint the dynamics on it.

References