



From price shock to physical scarcity

The non-linear propagation of a prolonged commodity disruption into the global economy and credit markets

The prolonged disruption of the Strait of Hormuz represents one of the largest potential supply shocks to the global economy. Conventional analyses typically focus on the immediate increase in oil prices and the inflationary consequences of higher energy costs. While these effects are important, they capture only the first stage of a much broader adjustment process.

Supply shocks of this magnitude propagate through the economy in a fundamentally non-linear manner. Initially, higher prices absorb most of the shock while physical availability remains largely unaffected. Once inventories and other operational buffers become insufficient, however, the adjustment mechanism gradually changes. Markets move from allocating scarce resources through prices to allocating them through quantities. Once this transition occurs, shortages spread rapidly through production networks and supply chains, causing economic disruptions that are disproportionate to the initial shock.

The oil crises of the 1970s already demonstrated that prolonged commodity disruptions do not affect the economy through prices alone. As inventories declined, governments increasingly resorted to administrative allocation and physical rationing. However, today's economy differs fundamentally from that of the 1970s. Modern production systems rely on highly integrated global supply chains, just-in-time inventories and specialised intermediate goods. Consequently, while the underlying adjustment mechanism remains similar, the propagation of shortages through production networks is likely to be considerably faster and more non-linear than during earlier oil crises.

Our simple three-phase framework explains how this transition occurs. It then applies the framework to the current global situation, assesses the relative vulnerability of the major economic regions, discusses the implications for macroeconomic activity and policy, and finally analyses the likely consequences for corporate credit markets and sector performance.

The central conclusion is that the greatest risk is not the initial increase in commodity prices but the eventual depletion of inventories and other buffers. Once operational stock levels are reached across several critical commodities simultaneously, the global economy may move from a price shock to an availability shock, fundamentally changing the behaviour of both the real economy and financial markets.

This risk is often underappreciated in traditional credit risk analysis. As part of the risk management process in portfolio management, however, investors should monitor price and availability dynamics of critical commodities and those companies who need them as input factors into their production processes. Likewise, companies who use the output of those directly affected companies as the input into their production processes could be the next in line when it comes to inhibited production lines and disrupted supply chains.

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1. Theoretical framework

Prices, scarcity and the non-linear adjustment of modern economies

Large supply shocks are often analysed as if they affected the economy through a smooth and continuous process. Prices increase, consumers reduce demand, firms adjust production, and a new equilibrium gradually emerges.

Modern industrial economies rarely behave in this manner. Instead, disruptions to critical commodities tend to follow a distinctly non-linear adjustment process. The reason is straightforward. Prices can adjust continuously from one transaction to the next, whereas physical availability changes only once inventories and spare capacity have been exhausted. Between these two mechanisms lies a transition period during which the economy appears considerably more stable than it actually is.

Understanding this distinction is important. Financial markets typically observe prices, while the real economy ultimately depends upon physical availability. The two need not move together. Indeed, during the early stages of a supply shock they often diverge significantly.

The adjustment process can therefore be understood as a sequence of three distinct Phases.

Secondly, production systems cannot adjust overnight. Industrial processes have been designed around existing inputs and supply chains. Firms therefore continue operating largely unchanged, at least initially.

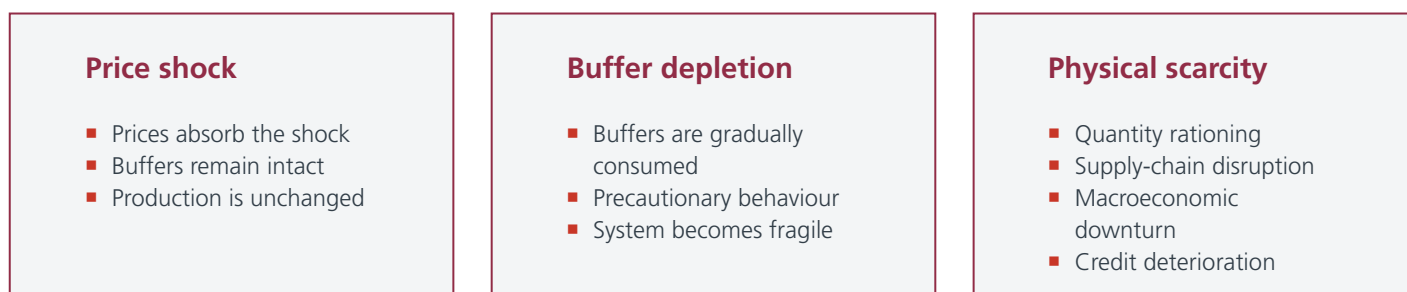
Thirdly, demand for many critical commodities is highly inelastic over short time horizons. Airlines cannot suddenly stop flying, freight companies cannot instantly reduce transport activity, and chemical producers cannot easily substitute away from essential feedstocks. Consumption therefore continues despite sharply higher prices.

The result is a temporary disconnect between financial markets and the real economy: prices rise rapidly while physical availability remains broadly intact and economic activity continues. This combination frequently creates the impression that the shock is manageable. In reality, the economy is consuming buffers faster than they are being replenished.

Phase 2 – Buffer depletion and emerging scarcity

Phase 2 begins when the economy progressively consumes the buffers that separate higher prices from physical scarcity. These buffers include inventories, spare production capacity, refining ca-

Figure 1: The three-Phase framework



Source: Quoniam Asset Management GmbH

Phase 1 – The price shock

The first Phase is characterised by a sharp increase in prices without widespread physical scarcity. When a critical supply route such as the Strait of Hormuz is disrupted, markets immediately begin to incorporate expectations of future shortages. Commodity prices rise as market participants compete for marginal supply and reassess future availability.

Despite this repricing, however, economic activity initially changes very little. Three mechanisms explain this apparent resilience. Firstly, inventories provide an effective buffer. Commercial stocks, cargoes already in transit and strategic reserves continue to satisfy current demand despite lower inflows.

capacity, transport flexibility and supplier diversification. At this point the adjustment mechanism changes fundamentally. The economy is no longer constrained primarily by prices but increasingly by the relationship between buffers and ongoing consumption.

Not all commodities enter this Phase simultaneously. Products differ considerably in their inventory levels, substitution possibilities and operational importance. Middle distillates such as diesel and jet fuel generally have lower inventories and fewer substitutes than crude oil itself. Consequently, they often become scarce first even while crude oil remains physically available.

As buffers decline, firms also encounter an important operational constraint. Inventories cannot simply be reduced to zero. Refineries, distribution systems, manufacturers and transport companies all require minimum working inventories to function safely and efficiently.

Once buffers approach these operational thresholds, behaviour changes. Companies begin to increase precautionary purchases, suppliers prioritise strategic customers, and spot markets become increasingly volatile. Access to material becomes progressively more valuable than price alone.

At the same time, logistical constraints begin to emerge. Even where sufficient crude oil exists globally, refining capacity, transportation infrastructure and regional distribution networks may become bottlenecks. Shortages therefore appear first in selected regions and products rather than across the entire economy. The system continues to function, but it becomes increasingly fragile.

Phase 3 – Physical scarcity and non-linear propagation

Phase 3 begins once these buffers are no longer sufficient to absorb additional shocks, forcing the economy to adjust through quantity rationing rather than prices. This marks a fundamental transition in the functioning of the economy. Markets no longer allocate resources primarily through prices, they allocate them through quantities.

Suppliers begin deciding who receives scarce materials rather than allowing prices alone to determine allocation. Contracts are curtailed, deliveries postponed and inventories reserved for strategically important customers. At this stage the effects spread rapidly beyond the commodities that triggered the original disruption. Modern economies operate as highly interconnected production networks.

- A shortage of diesel reduces freight capacity .
- Reduced freight capacity delays intermediate goods.
- Delayed intermediate goods interrupt manufacturing.
- Interrupted manufacturing reduces the availability of final products.

The economic consequences are therefore multiplicative rather than additive. Entire production processes can stop because one critical input is unavailable. These disruptions propagate throughout supply chains with increasing speed.

Companies shift their objective from optimisation to survival. Production schedules become intermittent. Inventories of finished goods begin to decline. Cash flows become increasingly volatile. Eventually, the original supply shock begins to generate a secondary demand shock. Production falls, employment weakens, household income declines, and consumption slows. What began as a commodity disruption gradually develops into a broad macroeconomic downturn.

The key characteristic of Phase 3 is therefore not merely higher prices. It is the emergence of widespread physical scarcity and the rapid, non-linear deterioration that follows.

Why the transition often goes unnoticed

One of the most striking characteristics of this adjustment is that the economy often appears remarkably stable until shortly before Phase 3 begins. This apparent stability should not be interpreted as evidence that the disruption has been successfully absorbed. Instead, it reflects the existence of temporary buffers. Firms generally hold substantially larger inventories of finished goods than of critical production inputs. Consumers therefore continue finding products on shop shelves long after manufacturers have begun experiencing shortages of intermediate materials.

Similarly, service-oriented economies tend to exhibit considerable resilience during the early stages of commodity shocks because services consume less energy per unit of output than manufacturing. This delays the visible deterioration of aggregate economic indicators.

Finally, governments and central banks frequently introduce measures that smooth the adjustment process. Strategic reserve releases, emergency procurement programmes, regulatory flexibility and contingency planning all postpone the emergence of physical scarcity. These interventions extend the transition period and reduce the risk of panic. However, they do not eliminate the underlying physical constraint. Buffers continue to decline and operational thresholds continue to approach. The adjustment process is delayed rather than avoided.

A framework for understanding supply shocks

The three-Phase framework provides a simple but powerful way of understanding large commodity disruptions.

- **Phase 1** is dominated by prices.
- **Phase 2** is characterised by declining buffers and increasing fragility.
- **Phase 3** begins once physical scarcity replaces price adjustment as the principal allocation mechanism.

The importance of this framework extends beyond the current situation in the Strait of Hormuz. It offers a general explanation of how modern economies respond to prolonged disruptions of critical commodities. Most importantly, it explains why supply shocks often appear manageable for an extended period before deteriorating rapidly.

The absence of widespread shortages should therefore not be interpreted as evidence that the system is resilient. It may simply indicate that buffers have not yet been exhausted.

The remainder of this analysis applies this framework to the current global situation. It examines where the major economic regions currently stand within the three Phases, analyses the implications for market participants, and finally considers the likely consequences for corporate credit markets and sector performance. It provides asset managers with a framework for identifying the early warning signals of supply-driven credit deterioration.

2. Applying the framework: Where does the world stand today?

The theoretical framework in the previous section provides a simple lens through which the current global situation can be interpreted. Rather than asking whether the Strait of Hormuz is formally open or closed, the more relevant question is where different regions currently stand within the three-Phase adjustment process. The answer is that the global economy has become increasingly asynchronous. The disruption is no longer progressing uniformly across countries or commodities. Instead, different regions have entered different Phases depending upon three structural characteristics: their dependence on Middle Eastern energy and raw materials, the size of their strategic inventories, and their ability to substitute disrupted supply chains.

This regional divergence is precisely what would be expected under the three-Phase framework. Since buffers differ across countries, the transition from higher prices to physical scarcity cannot occur simultaneously. Regions with limited buffers and high import dependence naturally enter Phase 3 earlier than regions with greater physical resilience.

At present, the world economy therefore does not occupy a single Phase. Instead, all three Phases coexist across different regions and commodities.

Asia: the first region to approach Phase 3

Asia remains the region most exposed to a prolonged disruption of the Strait of Hormuz.

More than four-fifths of the crude oil and liquefied natural gas transported through the Strait from countries such as Saudi Arabia, Qatar, and Kuwait is ultimately destined for Asian markets. While Europe and North America experience the disruption largely through higher global prices, Asia experiences it primarily through physical availability. Consequently, Asia has progressed furthest through the adjustment process.

The first countries to exhibit clear signs of Phase 3 have been those with limited strategic reserves and high dependence upon imported fuels.

Sri Lanka represents the clearest example. Fuel rationing was introduced by the government in March 2026, electricity shortages have required demand-management measures introduced in later March, and government policies have increasingly focused on reducing consumption rather than allowing prices alone to perform the adjustment. Shortened working weeks, remote working policies and restrictions on public activities illustrate a fundamental transition in the allocation mechanism. Energy is no longer allocated purely through markets but increasingly through administrative decisions.

Bangladesh has followed a similar path. Reductions in fuel allocations, interruptions to natural gas supply and temporary shutdowns of fertiliser production demonstrate that the disruption has already propagated beyond energy markets into agriculture and industrial production. The initial commodity shock has begun generating second-round effects in sectors that were not directly affected by the original disruption.

These two examples show how the propagation of commodity shortages works and what other countries may face if the disruption continues. Pakistan, for example, appears to occupy a slightly earlier position within the transition. The authorities have increasingly relied upon demand-management policies, including remote working initiatives, energy conservation measures and restrictions on large public events. These interventions suggest that buffers remain sufficient to avoid widespread shortages, but no longer sufficient to rely exclusively upon price adjustment. Pakistan therefore appears to be moving through late Phase 2 towards Phase 3. Larger Asian economies occupy somewhat earlier stages of the adjustment process.

India has so far been able to moderate the immediate effects through diversified procurement (switching for example to oil imports from Russia and Angola), strategic inventories and active government intervention. Nevertheless, pressure has become increasingly visible in diesel, liquefied petroleum gas (LPG) and fertiliser markets, suggesting that the country has entered Phase 2 even though widespread physical shortages have largely been avoided.

Japan and South Korea have also remained within Phase 2. Both countries possess sophisticated emergency planning systems and strategic reserves that significantly delay the emergence of scarcity. However, their dependence upon imported liquefied natural gas (LNG) and refined petroleum products implies that continued disruption would increasingly affect industrial production as buffers gradually decline.

The progression through the three Phases also differs across commodities.

Crude oil itself remains largely within Phase 1 because global inventories remain relatively abundant and crude can be rerouted more easily than refined products.

Jet fuel has advanced furthest towards Phase 3. Inventories are comparatively small, substitution possibilities are almost non-existent, and operational demand remains highly inflexible. Reports of cancelled flights and supply disruptions indicate that physical availability has already become more important than price in selected markets.

Diesel occupies perhaps the most critical position. It has clearly progressed into late Phase 2 across much of Asia. Because diesel underpins freight transport, agriculture and construction, it represents the commodity most likely to initiate broader economic disruption once inventories approach operational minimum levels.

Petrochemical feedstocks such as naphtha have also moved towards late Phase 2, particularly in Northeast Asia where large chemical complexes depend heavily upon Middle Eastern supplies. Sulphur and fertiliser markets appear somewhat earlier in the process but are steadily approaching the point where supply constraints begin affecting agricultural production and food prices.

Taken together, Asia has begun moving from a world in which higher prices dominate economic adjustment towards one in which physical scarcity increasingly determines production decisions.

The United States: strong physical buffers, emerging product constraints

The United States occupies a fundamentally different position within the adjustment process. Unlike most other major economies, the United States combines substantial domestic oil production with one of the world's largest refining industries and the Strategic Petroleum Reserve. These characteristics significantly delay the transition towards physical scarcity.

Consequently, crude oil itself remains largely within Phase 1. Higher prices have been the principal adjustment mechanism, while physical availability has remained broadly intact. This, however, should not be interpreted as evidence that the United States is immune to a prolonged disruption. Rather, the constraints emerge elsewhere.

The Strategic Petroleum Reserve contains crude oil rather than refined petroleum products. Its effectiveness therefore depends upon the ability of refineries to convert crude into usable fuels. Since refinery utilisation is already close to practical operating limits, additional crude availability does not automatically translate into greater supplies of diesel or jet fuel.

The adjustment therefore shifts from crude oil towards middle distillates. Diesel has emerged as the principal vulnerability. Commercial inventories remain below historical averages while export demand has increased substantially as other regions seek replacement supplies. In effect, the United States has increasingly become the balancing supplier for the global diesel market. This role strengthens the resilience of the global economy in the short term but gradually reduces domestic buffers if the disruption persists. Jet fuel appears somewhat less constrained. Current inventories remain comparatively comfortable, and widespread operational disruptions have so far been avoided. Nevertheless, jet fuel competes with diesel for refinery yield. As refining capacity approaches practical limits, increasing production of one product inevitably reduces flexibility in the other.

The United States therefore appears to occupy early-to-mid Phase 2. Buffers continue to perform most of the adjustment, and widespread physical shortages remain unlikely in the near term. However, the country is gradually approaching the point at which refining capacity and product inventories, rather than crude oil itself, become the principal constraints.

Europe: the world's critical transition region

Europe currently occupies an intermediate position between Asia and the United States. Unlike Asia, Europe benefits from mandatory strategic petroleum reserves, highly coordinated emergency planning and relatively sophisticated inventory management. These characteristics continue to delay the transition towards physical scarcity.

Unlike the United States, however, Europe remains structurally dependent upon imported energy and industrial feedstocks. This distinction has become increasingly important following the replacement of Russian pipeline gas by LNG imports bought on the global spot market. Europe has now become more dependent upon the availability of international shipping and global LNG markets.

Consequently, Europe's principal vulnerability no longer lies in crude oil itself. Instead, it lies in refined petroleum products, natural gas and industrial raw materials. Crude oil therefore remains largely within Phase 1.

Diesel, a critical input for the freight industry, has progressed considerably further. Inventories continue to decline, reaching at least a decade-low in April 2026, while competition for replacement supplies has intensified. Although physical shortages have remained limited, market behaviour increasingly reflects precautionary inventory building rather than normal commercial optimisation. This is characteristic of late Phase 2.

Natural gas occupies a similar position. European storage facilities continue to provide an important buffer, but prolonged disruption would increasingly force Europe into direct competition with Asian importers for globally available LNG cargoes. As inventories gradually decline, this competition is likely to intensify.

Perhaps the greatest medium-term vulnerability lies within fertiliser markets. European agriculture depends upon ammonia, urea and phosphate products whose production ultimately requires both natural gas and sulphur. Current agricultural production remains largely unaffected because inventories continue to provide protection. However, the timing of agricultural production means that shortages emerging today affect future harvests rather than current output. Fertiliser markets therefore illustrate particularly clearly how Phase 2 can conceal risks that become visible only months later.

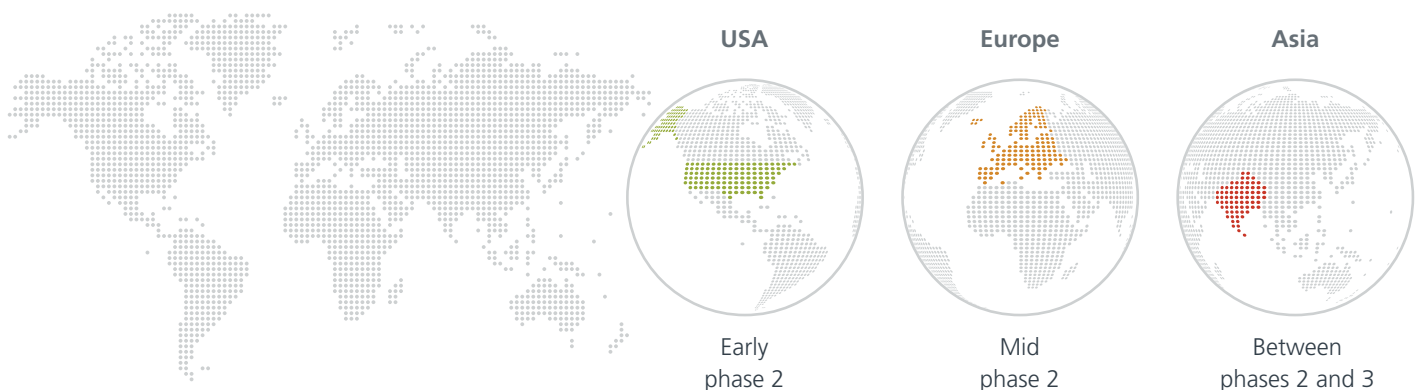
A similar observation applies to petrochemical feedstocks. European chemical producers increasingly compete for scarce naphtha and related products at a time when global supplies remain constrained. Since chemicals occupy an upstream position within manufacturing supply chains, disruptions in this sector have the potential to propagate rapidly into numerous downstream industries.

Overall, Europe appears firmly positioned within Phase 2. The region continues to benefit from inventories, institutional capacity and coordinated policy responses. Nevertheless, these buffers are gradually being consumed. Europe therefore represents perhaps the clearest example of an economy approaching the transition from price adjustment towards quantity adjustment.

This regional ordering has important implications for the likely timeline of future developments. Should physical flows through the Strait of Hormuz normalise rapidly and insurance, shipping and production return to pre-crisis conditions, the global economy would probably remain within Phase 2. Higher prices, weaker growth and reduced corporate profitability would persist, but widespread physical scarcity could largely be avoided.

A more gradual normalisation appears considerably more likely. Even if the Strait is formally reopened, damaged infrastructure, elevated insurance costs, cautious shipping companies and the gradual rebuilding of inventories imply that physical flows may recover only slowly. Under such a scenario, Asia is likely to progress further

Figure 2: Regional position within the three Phases



Source: Quoniam Asset Management GmbH

Comparing the regions

The most important conclusion from this regional assessment is that the global economy is no longer moving through the adjustment process as a single system. Instead, it has become regionally asynchronous.

- **Asia** has advanced furthest towards Phase 3 because of its heavy dependence upon Middle Eastern energy imports and comparatively limited inventories in several economies.
- **The United States** remains least advanced because domestic production, refining capacity and strategic reserves continue to provide substantial physical resilience.
- **Europe** occupies the critical intermediate position. It possesses stronger buffers than Asia but remains significantly more dependent upon imported energy and industrial commodities than the United States.

into Phase 3 over the coming weeks, while the likelihood increases that Europe approaches the same transition, potentially during late summer and early autumn.

The United States would probably remain one step behind, supported by greater domestic energy production and larger physical buffers. Nevertheless, even there the gradual depletion of product inventories and increasing pressure on refining capacity suggest that the adjustment process would continue.

The key implication is therefore straightforward. The potential reopening of the Strait of Hormuz should not be interpreted as the end of the adjustment process. The relevant variable is not whether shipping resumes. It is whether buffers can be rebuilt faster than they continue to be consumed. Only once that condition is met will the global economy begin moving back towards normal market functioning.

3. From scarcity to recession: Macroeconomic implications and the limits of economic policy

The regional assessment presented in the previous section illustrates that the world economy is no longer responding to the disruption of the Strait of Hormuz through higher prices alone. In several regions and commodities, the adjustment has already begun to shift towards physical scarcity where the respective commodity is no longer available in sufficient quantities and limits economic activity. This has profound macroeconomic implications.

Conventional economic analysis often interprets commodity shocks primarily as inflationary events. Higher energy prices reduce household purchasing power, increase production costs and eventually weaken aggregate demand. The resulting slowdown is then understood largely as a consequence of tighter monetary policy and declining real incomes. The three-Phase framework suggests a different sequence.

During Phase 1 and much of Phase 2, this conventional interpretation remains broadly correct. Prices perform most of the adjustment while buffers absorb the physical disruption. Economic activity slows primarily because production becomes more expensive.

Phase 3 represents a fundamentally different economic regime. Once buffers approach operational minimum levels, production is no longer constrained primarily by costs. Instead, it becomes constrained by the physical availability of essential inputs.

This distinction is critical: higher prices reduce economic activity because firms choose to produce less. Physical scarcity reduces economic activity because firms can no longer produce, regardless of price. The implications for the broader economy are therefore substantially more severe.

From price adjustment to quantity adjustment

Market economies normally allocate scarce resources through prices. Higher prices encourage conservation, stimulate additional supply and direct available resources towards their highest-value uses.

During Phase 3, however, prices gradually lose their ability to perform this function. Once critical commodities become physically unavailable, firms cannot simply pay more to obtain them. Instead, suppliers begin allocating limited production administratively. Long-standing customers receive priority and governments reserve supplies for strategically important sectors. Emergency services, food production and critical infrastructure most likely receive preferential access. Other firms receive reduced deliveries or none at all.

The economy therefore moves from a price-based allocation mechanism towards a quantity-based allocation mechanism. This represents a fundamental change in how markets function. Economic output increasingly becomes determined by physical availability rather than financial purchasing power.

Why modern economies are particularly vulnerable

Modern industrial economies have become extraordinarily efficient. Over recent decades, firms have reduced inventories, optimised logistics and developed highly specialised global supply chains. These developments have significantly increased productivity and reduced costs.

At the same time, however, they have reduced resilience. Many production processes now depend upon the uninterrupted availability of hundreds or thousands of intermediate goods arriving precisely when required. A modern car plant, for example, with just-in-time production depends on thousands of parts—semi-conductors, wiring harnesses, seats, tyres, sensors, glass, fasteners and many more—arriving in the correct sequence shortly before they are installed. This operating model functions exceptionally well under normal conditions, but less so once shortages emerge.

A manufacturer rarely requires every component to become unavailable before production stops. One missing input is frequently sufficient. The consequence is that shortages propagate through production networks much faster than might initially appear justified by the magnitude of the original commodity shock.

This explains why the economic consequences of Phase 3 become highly non-linear. The economy does not gradually slow. Instead, individual production processes begin failing, followed by increasingly broad disruptions across manufacturing, logistics and eventually consumer markets.

From supply shock to demand shock

One of the most important characteristics of Phase 3 is that the original supply shock is very likely to gradually generate a secondary demand shock. Initially, demand remains remarkably resilient as consumers continue purchasing fuel despite higher prices, manufacturers continue operating using inventories, and households observe little change beyond rising inflation.

As shortages spread, however, production itself begins to decline. Factories operate intermittently because essential inputs arrive unpredictably. Transport capacity becomes increasingly constrained, and industrial utilisation falls, employment weakens, and corporate investment is postponed.

At this point, aggregate demand begins to contract. Household income declines, business confidence deteriorates, and consumption weakens.

The economy therefore is likely to experience two distinct shocks. The first originates in commodity markets. The second is created by the economy itself as lower production generates lower income and weaker demand. This sequence distinguishes a prolonged supply disruption from an ordinary cyclical recession.

The magnitude of the downturn

An obvious question follows: If Phase 3 were to emerge simultaneously across Asia, Europe and North America, would the global economy experience a conventional downturn or something considerably more severe?

The answer depends primarily upon the duration of physical scarcity. If inventories can be rebuilt before widespread production interruptions become persistent, the resulting drag on economic activity would probably resemble a global downturn characterised by weak growth, elevated inflation and a temporary increase in corporate defaults.

If, however, quantity rationing persists for several quarters across multiple critical commodities, the adjustment could become considerably more disruptive.

In such a scenario, industrial production would increasingly be determined by access to physical inputs rather than by demand. Manufacturing capacity would remain idle despite the continued willingness of firms and consumers to purchase goods. Investment would collapse because future production could no longer be planned with confidence. Credit conditions would tighten as lenders increasingly questioned borrowers' ability to continue operating.

Such an environment would exhibit many characteristics commonly associated with economic recessions, even if policy intervention would stabilise the financial system.

The distinction is therefore less about the absolute decline in GDP than about the underlying mechanism. A regular downturn reflects insufficient demand. Phase 3 reflects insufficient physical availability.

The role of economic policy

Economic policymakers possess powerful tools for stabilising financial markets. Central banks can lower policy rates, provide emergency liquidity, purchase financial assets and ensure that banks continue supplying credit to the real economy.

Governments can introduce fiscal stimulus, guarantee corporate borrowing, subsidise employment and support strategically important industries.

These measures have proved highly effective during previous crises, but their effectiveness during Phase 3 is more limited. Financial policy can create liquidity, but it cannot create physical commodities. Central banks can reduce borrowing costs, but they cannot produce diesel. Governments can guarantee corporate loans, but they cannot manufacture sulphur, ammonia or jet fuel.

Consequently, economic policy addresses only one side of the problem. It can substantially reduce financial distress by preventing otherwise solvent firms from failing because of temporary funding shortages. It can prevent disorderly deleveraging, reduce panic, and stabilise capital markets.

What it cannot do is eliminate the physical constraint. If production depends upon commodities that remain unavailable, liquidity merely allows firms to survive while waiting for supply chains to recover. Policy therefore acts primarily as a bridge.

Its success depends upon whether physical availability is restored before corporate balance sheets become exhausted.

Corporate defaults

This distinction also changes the nature of corporate credit risk. During a conventional recession, companies typically fail because demand declines. This leads to weakening sales, falling profits and deteriorating cash flows. Eventually, highly leveraged firms become unable to service their debt.

During Phase 3, companies may instead become distressed despite continued customer demand as production may become impossible because essential inputs cannot be obtained. Working capital requirements increase as firms attempt to secure inventories, operating costs rise, production becomes intermittent, and cash flow becomes increasingly volatile.

This combination creates a form of financial stress that differs fundamentally from a traditional cyclical downturn. Even companies with previously strong balance sheets may experience liquidity pressures if they remain unable to operate normally for extended periods. Consequently, default rates would almost certainly increase.

The largest increases would initially occur among speculative-grade borrowers with limited financial flexibility. However, prolonged Phase 3 conditions would increasingly affect larger and higher-rated issuers as liquidity reserves are gradually consumed.

The principal risk therefore lies not in an immediate wave of insolvencies. Rather, it lies in the gradual migration of operational disruption into corporate balance sheets.

Looking beyond the macroeconomy

The transition from Phase 2 to Phase 3 therefore changes the way investors should analyse economic risk. During the early stages of the adjustment, inflation, interest rates and energy prices remain the dominant variables.

Once physical scarcity begins to emerge, however, a different set of questions becomes increasingly important. Which firms continue receiving critical inputs? Which industries remain capable of operating? Which regions possess sufficient buffers? Which companies can finance extended working-capital requirements?

These questions ultimately determine the resilience of both the real economy and financial markets.

The next section therefore turns from macroeconomics towards corporate credit markets and examines how this transition from price adjustment to quantity adjustment is likely to be reflected in credit spreads.

4. Financial market implications: From operational uncertainty to credit risk

The previous sections argued that the transition from Phase 2 to Phase 3 fundamentally changes the nature of the macroeconomic adjustment. As long as buffers continue absorbing the disruption, financial markets primarily respond to higher inflation, weaker growth and changing monetary policy expectations. Once physical scarcity begins to constrain production, however, a different transmission mechanism emerges.

A prolonged Phase 3 scarcity shock would affect credit markets through several channels simultaneously. In practice, investment-grade spreads incorporate at least four distinct risk premia:

- Expected default loss.
- The possibility that issuers may be downgraded, even if they never default.
- Investor compensation for declining market liquidity during periods of stress.
- A broader uncertainty premium that increases whenever future economic outcomes become unusually difficult to assess.

Phase 3 creates a situation where default probabilities increase, downgrade risk rises sharply, and market liquidity deteriorates. At the same time, investors face exceptional uncertainty regarding the duration of the physical disruption and the ability of firms to continue operating.

Consequently, credit spreads widen by considerably more than realised default losses alone would justify. This phenomenon is well illustrated by previous crises.

During the Global Financial Crisis, investment-grade spreads reached levels that implied substantially larger losses than were ultimately realised. Investors were not pricing only expected defaults. They were pricing uncertainty regarding the functioning of the financial system itself.

A prolonged Phase 3 scarcity shock would produce a similar repricing, although the underlying source of uncertainty would be fundamentally different. Instead of questioning the stability of banks, investors would increasingly question the ability of otherwise healthy companies to maintain production. Understanding the mechanism and monitoring its current status quo is therefore an essential task for credit portfolio managers if they take risk management in their portfolios seriously.

From earnings risk to operational risk

Most recessions affect corporate credit through declining demand. Consumers reduce spending, corporate revenues weaken, and margins contract. Lower earnings eventually translate into weaker credit quality.

Phase 3 follows a different sequence. Many companies may continue facing healthy customer demand while simultaneously becoming unable to satisfy it. While orders remain and customers are willing to pay, production becomes increasingly intermittent because critical inputs cannot be obtained reliably.

This distinction changes the nature of credit analysis. Traditional credit research places considerable emphasis upon variables such as leverage ratios, interest coverage and earnings sensitivity. These variables remain important, but they no longer tell the entire story.

During Phase 3, investors must increasingly evaluate operational resilience.

- Can the company secure diesel for its transport fleet?
- Can it obtain sufficient chemical feedstocks?
- Can production continue if logistics become unreliable?
- Can inventories be maintained while working capital requirements increase?

Operational resilience therefore becomes an increasingly important determinant of credit quality.

Investment grade is not immune

One might conclude that investment-grade issuers should remain largely insulated from such developments because of their stronger balance sheets and greater financial flexibility. To a significant extent this is true. Investment-grade companies generally possess greater liquidity reserves, better access to capital markets and more diversified financing than speculative-grade issuers.

These characteristics substantially reduce near-term default risk, but they do not eliminate operational risk. The distinguishing feature of Phase 3 is that companies may experience financial distress despite continued customer demand. Production interruptions reduce cash generation, working-capital requirements increase as inventories become more difficult to secure, and refinancing needs arise precisely when investors become increasingly risk averse.

Consequently, financial strength gradually becomes consumed by operational disruption. The first consequence is not widespread default, but widespread deterioration in perceived credit quality. Rating agencies are likely to begin revising outlooks, while BBB issuers increasingly face the possibility of becoming fallen angels. Investors most certainly demand greater compensation for uncertainty. Credit spreads therefore widen long before realised defaults become visible.

Aggregate credit spread behaviour

Historical experience provides a useful benchmark for the magnitude of potential spread widening. During the Global Financial Crisis, investment-grade spreads in both Europe and the United States reached unprecedented levels as investors questioned the stability of the financial system.

The present scenario differs fundamentally. The financial system itself is considerably stronger than in 2008. Banks are better capitalised while central banks possess well-established liquidity facilities and regulatory frameworks have improved substantially. These factors should reduce systemic financial risk.

At the same time, the real economy is arguably more vulnerable to prolonged physical scarcity than it was during the financial crisis. The question therefore becomes whether operational disruption can generate spread widening comparable to a banking crisis.

In 2008 investors questioned whether financial institutions would survive. In a global Phase 3 scenario investors would increasingly question whether industrial production can continue. The resulting uncertainty may justify investment-grade spreads approaching previous historical extremes even if realised default rates remain considerably lower.

Europe versus the United States

In historical crises, US investment-grade spreads widened more than European spreads. The Global Financial Crisis originated within the United States, and, consequently, US corporate credit naturally experienced the greatest repricing.

A prolonged commodity scarcity shock presents a different geographical pattern. Europe appears structurally more vulnerable than the United States.

The United States combines substantial domestic energy production with one of the world's largest refining industries and significant strategic reserves. Although diesel and other refined products represent increasingly important constraints, the country retains considerable physical resilience.

Europe occupies a different position. Following the replacement of Russian pipeline gas, European industry has become increasingly dependent upon imported LNG and globally traded industrial feedstocks. Diesel, fertilisers, petrochemical raw materials and natural gas therefore represent considerably more important constraints than in the United States.

Europe is also likely to enter Phase 3 earlier than the US. Asia is already progressing furthest through the adjustment process. As Asian importers compete for replacement supplies, Europe increasingly competes for the same globally available cargoes. By the time the United States begins experiencing meaningful pressure on refined products, Europe may already have spent months drawing inventories and operating under increasingly constrained supply conditions.

The chronology therefore would differ from previous crises. Asia would enter Phase 3 first, Europe would follow, the United States would remain buffered for longer. This sequence suggests that European investment-grade spreads could ultimately widen beyond their historical relationship with US credit.

Defaults and rating migration

Although spreads may increase significantly in such a scenario, realised defaults are unlikely to increase proportionately. The first stage of credit deterioration is likely to consist primarily of rating migration. Companies that entered the disruption with relatively conservative balance sheets may nevertheless experience multiple-notch downgrades as earnings weaken, inventories decline and refinancing risks increase.

The most significant transition is therefore likely to occur within the BBB segment. As uncertainty increases, investors begin assigning greater probability to future fallen angels. This mechanism alone may account for a substantial proportion of investment-grade spread widening.

Actual defaults would initially remain concentrated among speculative-grade issuers with limited liquidity and restricted market access. Only if Phase 3 persists for an extended period would defaults gradually migrate into the lower tiers of investment grade.

The principal risk therefore lies not in an immediate wave of bankruptcies but in the gradual erosion of financial resilience across increasingly large and highly rated companies.

Looking beyond financial ratios

Credit analysis begins with financial statements. Phase 3 requires a broader perspective. The relevant questions increasingly concern the ability of companies to continue operating rather than merely their ability to service debt under normal business conditions. Can production continue despite shortages of critical commodities? Can inventories be rebuilt? Can supply chains remain intact? Can logistics continue functioning reliably?

The answers to these questions ultimately determine future cash generation. Financial ratios therefore become increasingly lagging indicators. Operational resilience becomes the leading indicator. Therefore, investors require a new framework for understanding sector risk. Instead of classifying industries simply as cyclical or defensive, they must ask a different question: How close is each sector to the original commodity shock?

The final section develops such a framework and argues that the „distance from the commodity shock“ provides a useful way of understanding the likely sequence of credit deterioration across the corporate universe.

5. A new framework for sector analysis: Distance from the commodity shock

The previous sections have argued that the transition from Phase 2 to Phase 3 fundamentally changes the nature of macroeconomic and credit risk. Once physical scarcity replaces price adjustment as the principal allocation mechanism, investors can no longer analyse companies solely through the traditional lenses of leverage, earnings cyclicity or interest-rate sensitivity.

A different question becomes increasingly important: How directly does a company's production process depend upon the commodities that are becoming scarce?

This observation leads naturally to a second analytical framework. The three-Phase model developed in the first section explains how scarcity propagates through time. The framework developed here explains how scarcity propagates across the corporate sector.

Instead of classifying industries simply as cyclical or defensive, firms can be classified according to their distance from the original commodity shock. The smaller this distance, the earlier a sector is likely to experience operational disruption, deteriorating credit quality and widening credit spreads.

Why traditional sector classification becomes less useful

During ordinary business cycles, investors typically distinguish between cyclical and defensive industries. Cyclical sectors depend primarily upon economic growth, while defensive sectors exhibit relatively stable demand throughout the business cycle.

This distinction has proved useful for analysing demand-driven recessions. Phase 3, however, differs fundamentally. The initial constraint is not insufficient demand; it is insufficient physical availability. Consequently, two companies with identical leverage, profitability and demand characteristics may experience completely different outcomes depending upon the commodities required for production.

The relevant variable therefore becomes production dependence rather than demand sensitivity. Industries located close to the original commodity shock experience operational disruption first. Industries located further away continue operating normally until the shortage propagates through supply chains and eventually weakens aggregate demand.

The propagation mechanism therefore follows production networks rather than conventional business cycles.

Four layers of vulnerability

Figure 3: Distance from the commodity shock

Airlines Chemicals Fertilisers	Logistics Construction Automotive	Machinery Banks Retail	Software Telecom Healthcare
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Source: Quoniam Asset Management GmbH

The resulting framework divides the economy into four broad groups.

- The first group consists of industries that consume the scarce commodities directly. These sectors form the front line of the adjustment process.
- The second group depends upon intermediate goods produced by the first group. Their disruption is indirect but nevertheless substantial.
- The third group is affected primarily through deteriorating macroeconomic conditions rather than immediate shortages.
- Finally, a fourth group consists of industries whose production depends predominantly upon human capital rather than scarce physical inputs. These sectors remain comparatively insulated until very late in the adjustment process.

The framework therefore follows the same logic as the three-Phase model. Scarcity propagates sequentially rather than simultaneously.

Layer one: commodity-dependent industries

The industries closest to the commodity shock are those whose production processes require continuous access to fuels, industrial gases or petrochemical feedstocks. Examples include airlines, chemical producers, fertiliser manufacturers, freight transport, construction materials and portions of basic manufacturing.

These sectors exhibit several common characteristics: Their inventories are typically limited, substitution possibilities are extremely restricted, and production depends upon continuous deliveries rather than accumulated stock. Consequently, they are among the first industries to enter Phase 3.

Airlines provide perhaps the clearest example. Aircraft cannot operate without jet fuel, and airlines generally maintain only limited fuel inventories. Higher prices reduce profitability, but physical shortages immediately reduce flight activity. Once jet fuel becomes rationed, production effectively ceases.

Chemical producers occupy a similarly vulnerable position. Naphtha, natural gas, sulphur and industrial gases represent essential production inputs rather than ordinary operating expenses. Since chemicals occupy an upstream position within global manufacturing, disruptions propagate rapidly into numerous downstream industries.

Fertiliser producers represent another critical case. Production depends simultaneously upon natural gas, ammonia and sulphur, all of which are directly affected by prolonged disruptions in Middle Eastern supply. The resulting shortages may initially appear limited to fertiliser markets, yet their economic consequences ultimately emerge within agricultural production and food prices. The distinguishing characteristic of this first layer is therefore that operational disruption originates within the production process itself.

Layer two: manufacturing industries

The second layer consists primarily of manufacturers that consume the output of the first group. Automobile producers, machinery manufacturers, industrial equipment suppliers, consumer discretionary and many engineering companies belong to this category.

These industries rarely experience the initial commodity shortage directly. Instead, they become affected because suppliers can no longer deliver intermediate goods reliably. For example, a shortage of petrochemical feedstocks reduces plastics production, which delays automotive components, and the missing components interrupt vehicle assembly. The same logic applies throughout modern manufacturing.

The economic consequences can become disproportionately large because highly integrated production systems depend upon the simultaneous availability of thousands of components. One missing input frequently prevents completion of the final product. Consequently, manufacturing industries often experience severe operational disruption despite relatively modest direct exposure to the original commodity.

Layer three: demand-sensitive industries

The third layer consists of sectors that remain operationally resilient but become increasingly affected by the macroeconomic consequences of the disruption. Retail, consumer services, media, commercial real estate, financial services and many leisure activities belong to this group.

These industries generally possess relatively limited direct dependence upon scarce commodities. Instead, they experience lower revenues because employment weakens, household income declines and corporate investment slows.

Banks provide a particularly interesting example. Traditional recession analysis frequently identifies banks among the earliest victims of economic downturns, but the present framework suggests a different sequence.

Banks consume relatively little diesel, natural gas or petrochemical feedstocks. Their operations therefore continue largely unaffected during the early stages of the disruption. Only after industrial companies begin experiencing financial stress does credit quality deteriorate within the banking system. The banking sector therefore enters the adjustment process later than many industrial borrowers.

This observation illustrates an important feature of the framework. Physical scarcity propagates through production networks before it propagates through financial networks.

Layer four: knowledge-intensive industries

The industries furthest removed from the original commodity shock are those whose production depends predominantly upon skilled labour rather than physical commodities. Software development, information technology services, professional services, telecommunications and large parts of the healthcare sector belong to this category.

These industries continue consuming electricity and transport services, but their value added derives primarily from human capital. Consequently, production can generally continue even while commodity-intensive industries experience severe disruption.

Demand may eventually weaken as the broader economy slows. Operational capability, however, remains comparatively intact. It is important to note that these sectors are not immune to recession. Rather, they are likely to experience economic weakness considerably later than industries located closer to the original commodity shock.

A sequential view of credit deterioration

Taken together, the four layers imply that credit deterioration should itself occur sequentially.

- The first deterioration occurs within commodity-intensive sectors as shortages interrupt production.
- The second wave affects manufacturers through disrupted supply chains.
- The third wave reflects the broader macroeconomic slowdown as declining employment and investment weaken aggregate demand.
- Finally, the most resilient knowledge-intensive industries experience slower growth primarily because the overall economy has weakened rather than because their own production processes have become impaired.

This sequence differs fundamentally from conventional recession analysis. Instead of demand determining the order of deterioration, physical scarcity determines the order.

Credit markets should therefore begin repricing industries long before accounting measures such as earnings, leverage or interest coverage fully reflect the underlying deterioration. Operational resilience becomes the leading indicator of future credit quality.

Implications for credit investors

This framework has several practical implications for the risk management of credit portfolios.

Firstly, investors should increasingly analyse production processes rather than financial statements alone. Traditional balance-sheet analysis remains necessary, but it is no longer sufficient.

Secondly, supply-chain resilience becomes an increasingly important credit variable. Companies with diversified suppliers, greater inventory flexibility and stronger logistical capabilities should command a structural premium during prolonged commodity disruptions.

Thirdly, regional exposure becomes considerably more important. A company operating in Europe may experience materially different credit dynamics from an otherwise identical company operating in North America simply because the surrounding production system occupies a different Phase of the adjustment process.

Finally, credit spreads themselves should increasingly be interpreted as pricing operational uncertainty rather than purely financial leverage. Industries closest to the commodity shock are likely to experience spread widening first. Other sectors follow as the disruption propagates through the economy.

Implications for credit portfolio monitoring

The framework developed in this paper provides a practical approach for monitoring the risks that commodity shortages pose to corporate credit portfolios. Quantitative portfolio management is particularly well suited to this task because the required indicators—commodity prices, inventories, supplier relationships, sector classifications and market signals—can all be monitored systematically and updated continuously.

The first step is to monitor the evolution of the affected commodities and, more importantly, the buffers that separate higher prices from physical scarcity. These buffers include inventories, spare production capacity, refining capacity and logistical flexibility, although inventories often provide the best observable proxy. Persistent price increases may indicate that markets are becoming tighter, while a sustained depletion of inventories or other buffers suggests that the economy is moving closer to the transition from price adjustment towards quantity rationing. Because the adjustment process differs across regions, this monitoring should be conducted separately for each major geographical market.

The second step is to classify issuers according to their distance from the commodity shock. Companies in layer 1 consume the stressed commodity directly and should therefore be linked immediately to the relevant commodity dashboard. Whenever commodity monitoring signals increasing stress, portfolio managers should seek confirmation at the issuer level through indicators such as relative spread widening, equity underperformance, negative earnings revisions or increasingly cautious language during earnings calls.

For layer 2 companies, one additional analytical step is required. Since these firms are affected primarily through upstream suppliers, the relevant supplier industries—such as chemical producers, fuel suppliers, logistics providers or basic materials companies—should first be monitored. Once stress becomes visible in these upstream sectors, the same issuer-level monitoring process can be applied to the downstream companies.

6. Conclusion

Although the quality and frequency of commodity data differ considerably across regions and products, systematic monitoring of commodity markets, critical buffers and issuer-level signals provides a practical starting point for assessing the propagation of supply shocks into corporate credit portfolios. Most importantly, the framework encourages investors to monitor not only prices, but also the gradual erosion of the buffers that ultimately determine when operational disruption begins.

Commodity dashboard example

Commodity	Global/ Hormuz impulse	Europe inventory stress	US inventory stress	Asia inventory stress	Price stress
Diesel	-1.2	-1.5	-1.0	-1.8	-0.5
Jet fuel	-1.0	-1.3	-0.8	-1.6	-0.5
LNG	0.2	-1.0	1.2	-0.2	-0.6
Ammonia	-0.5	-0.5	-0.5	-0.5	-0.2
Urea	-0.6	-1.0	0.0	-1.0	-0.2
Aluminium	0.3	0.0	0.5	-0.3	-0.3

The graph shows an example for a dashboard for commodities affected by the Strait of Hormuz disruption. It contains price and inventory stress, the latter also by region. The measures in this example are designed as Z scores against historical averages. Source: Quoniam Asset Management GmbH

The purpose of this analysis has been to develop a framework for understanding how large commodity disruptions propagate through modern economies and financial markets.

Our three-Phase framework explains the time dimension of the adjustment process. It shows why prolonged supply shocks often appear manageable until buffers approach operational minimum levels and quantity rationing replaces price adjustment.

The distance-from-the-commodity-shock framework complements this analysis by explaining the cross-sectional dimension. It identifies which regions and industries are likely to experience operational disruption first and how that disruption subsequently propagates through production networks, the macroeconomy and finally financial markets.

Together, the two frameworks provide a coherent way of analysing supply-driven crises. They suggest that the key question is no longer whether commodity prices increase. It is whether buffers continue to decline faster than they can be rebuilt.

As long as the system's buffers remain sufficient to absorb the disruption, higher prices perform most of the adjustment. Once these buffers approach their operational limits, physical availability becomes the binding constraint.

The framework developed here is not specific to oil markets. Any supply chain characterised by inventories, limited spare capacity and highly interconnected production networks is likely to exhibit the same non-linear adjustment dynamics. The recent disruptions in semiconductors, natural gas and critical minerals suggest that this mechanism may become increasingly relevant in an era of greater geopolitical fragmentation.

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About Quoniam

Quoniam is a pioneer in quantitative asset management. Our goal is to create client-oriented investment solutions with a reliable alpha for institutional investors based on scientific findings and modern technology. As a partner-led company with more than 120 employees in Frankfurt and London, we manage approximately 27 billion euros in equity, fixed income, and multi-asset strategies. Our success is rooted in the efficient processing of the increasing amount of capital market data and information and employing this data to facilitate reliable investment decisions. We operate independently and seek innovative solutions. Simultaneously, our entrepreneurial freedom is grounded in a solid financial foundation owing to our affiliation with Union Investment Group. We passionately strive to create value for our clients and to make positive contributions to society. We are committed to the Principles for Responsible Investment and aim to globally promote sustainable investment.

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