The risks from disorganised climate transitions

Net zero commitments from companies and countries may give the impression that there is a single, coordinated transition to a low-carbon economy. However, there is not one single, homogenous global climate transition – there will be many multiple transitions across regions and sectors of the economy that may lag or outpace one another, leapfrog or even reverse.

Central banks and regulators have attempted to categorise the transition scenarios that can be used to test climate-related risks to global and national financial system stability. The main distinction in their scenarios is between organised transitions – where a consistent, well designed transition minimises the cost and economic inefficiency of the transition – and disorganised transitions. Disorganised transitions should reflect the potential and likely paths that a transition could take given the uncertainties around, and responses to, politics, policy, technology, and consumer and investor behaviour. These scenarios reflect, in effect, the transition path that is most likely given current conditions absent some sort of organising force. Even though these scenarios appear more likely and more reflective of the real world, we do not yet have scenarios that adequately address the potential sources and magnitudes of risks that could affect financial systems.

With respect to scenarios of disorganised transitions we currently see at least four major issues that need to be addressed to evaluate adequately the potential for financial risk:

- Transition timing;
- The mismatch between changes in demand (i.e., policy, technology, and behaviour) and supply (i.e., investment);
- Expected risk versus extreme/outlier risk;
- Uneven transitions – either by geography or industry.

1 Transition timing

Of the four, the timing issue has been the focus of policymakers. This current focus delivers a strong signal that an early, steady, and well-planned transition will lead to lower financial risks than a delayed, but accelerated transition. However, from the perspective of managing financial risk, markets might expect that policymakers, when faced with financial instability driven by a chaotic and accelerated transition, would choose to miss climate targets rather than cause the financial instability. If this is the case, the key risks will be physical risks from the additional climate change caused by the incremental emissions from missing climate targets, rather than the costs of a disorganized transition. Therefore, from the perspective of managing systemic risks in the real world, the current delayed transition scenario provides little insight into actual risks for the economic transition, unless much more stringent and binding carbon budget targets are developed, implemented, and relied upon.

2 The mismatch between supply and demand

A mismatch between the supply of low or high carbon products and services and demand for these products and services, is arguably the main source of risk to the financial system. The supply of low or high carbon products and services is mainly driven by investment, infrastructure, and business strategy, while demand is driven by policy, consumer behaviour, and technology.

An oversupply of coal or oil – or copper, solar panels, electric vehicles, dairy products or steel produced with near zero carbon emissions – compared to demand for those products will lead to collapsing prices, stranded investments, deteriorating balance sheets, defaults, bankruptcies, unemployment, and financial distress. Alternatively, too much demand for those products relative to supply leads to shortages, volatile and spiking commodity prices, supply chain and production failures, defaults, unemployment, and financial distress. In each case, the policy and market responses will attempt to limit the financial and economic impact, but often at the cost of slowing down the transition. For example, lower oil prices will encourage increased oil consumption and discourage policy responses directed at reducing consumption and emissions, while shortages of cobalt or copper could increase the cost of electrification, batteries, or renewable energy, and therefore slow the transition and the policy response.

From this perspective, there are four types of mismatch:

a. **Where the investment in and supply of high carbon products continues** to increase, despite an aggressive policy and technology response that reduces demand for these products and commodities beyond market expectations;

b. **Where the supply of low carbon substitutes does not develop** enough to meet the demands of an aggressive policy and technology response;

c. **Where investment falls in high carbon products,** but the policy, consumer behaviour, and technology transition responses fail to materialise and drive demand for these products;

d. **Where the supply of low carbon substitutes develops faster** than the policy, consumer behaviour, and technology responses to create the demand.

Much of the recent work of policymakers and the finance community has been on type a) mismatches. That is, the major concern has been for potential "stranded assets," where companies and investors fail to recognise the pending collapse in demand and then face a shrinking market for their products, which causes write offs and significant losses of value. In the worst case, these losses are recognised and priced in suddenly, equity markets fall sharply, investors in these markets experience losses that constrain investment and growth in the economy, leading to stagnation, recession, and financial instability.

Although this narrative remains plausible and concerning, we note that the share of the developed world equity index represented by the sectors most at risk to a climate transition – energy, utilities, metals and mining, steel, chemicals, high carbon transport, etc – has fallen significantly in the last five years. Therefore, some of the risk has already been priced into equity markets, partly due to lower long-term price expectations around oil, coal, and other commodities. However, we also note that much of the transition risk has moved from public equities to non-listed investment vehicles, credit markets, or to increased investment by sovereigns and their state-owned companies.

Type b) and d) mismatches, where the supply of new low carbon alternatives either falls short of or exceeds policy and behaviour expectations, will have serious and detrimental implications for the transition itself. This is particularly true if supply shortages and/or high input prices increase the relative cost of these new low carbon alternatives and cause reconsideration and slowing down of the transition. However, the impact on financial stability is likely to be much smaller than type a) mismatches, mainly because the new investment and stock of capital in these emerging low carbon products is currently much smaller. While there will be an impact, it is more likely to be on the parts of the investment chain that are more able and used to bearing this risk such as early stage investment and venture capital. The exceptions are crossover products, such as copper, where shortages caused by a failure to develop enough supply to meet the emerging low carbon substitute market cause price spikes that will ripple through the entire economy, including well established sectors – both low and high carbon – that depend on copper and related products.

Type c) mismatches seem to be the least explored transition risks, even though they are increasingly seeming to be the more likely and more dangerous of the four. For example, a world where oil supply falls, without the policy to restrict demand for oil products, could cause sharp spikes in oil prices. These spikes would, likely, be followed by aggressive policy action, supply responses from OPEC and tight oil producers, and falls in demand that would cause oil prices – with a lag – to crash. The crash would deter further policy action, cause oil company bankruptcies, and falling supply that would lead to the next oil price spike, and so on. Arguably, this pattern is closer to what we have been seeing in the last few years than the organised transition. An acceleration of this pattern could cause significant financial distress.

We note that each commodity or sector has its unique set of market conditions. Oil markets have OPEC supplies and unconventional production that can be brought onto the market relatively quickly to help dampen the spikes and troughs. Thermal coal is declining in significance in many markets, has some ready substitutes, and is divided into many regional markets, with the two largest markets – China and India – producing most of their own coal, making the boom and bust potential a national, rather than global, phenomena. Nevertheless, the importance of these markets could create significant risk to financial stability if the transition is unbalanced.

3 Expected risk versus extreme risk

An important question in scenario development is whether we should be addressing average expected risk, or extreme potential risk. The answer, as always, depends upon the objective and the segment of the investment universe in question. Creditors, famously, experience asymmetric risk associated with default probabilities and, therefore, are concerned with more extreme, lower probability, higher impact combinations of risk; while equity investors have more symmetric risk and, therefore, are more concerned about averages and balancing risks. The financial system, of course, includes a mix of both. Therefore, in the best of all worlds we would include both expected transition risk and maximum transition risk scenarios.

Moving between expected transition scenarios for each sector and geography to extreme transition scenarios for each sector and geography will help to quantify risk. However, as we explain below, it is the ability to mix and match different sector and geography combinations – which sectors and geographies move how far and when – which is essential to identify and manage the real world risks for both financial institutions and sovereign balance sheets.

4 Uneven transitions by geography or sector

Most climate transition scenarios are currently built around parallel action across sectors and to some extent, geographies. This implies that oil, coal, steel, dairy, and consumer goods either all manage a well-timed organised transition, or all delay and have a disorganised one together. The reality is that some sectors will transition rapidly, while others will lag, some will be organised, and others will be disorganised. For example, we have seen significant transitions around coal fired power in the US and Europe, with sporadic progress in oil and much less progress in steel or cement. Meanwhile, a thermal coal phase out in China started, sputtered, reversed itself, and remains uncertain in timing or strength.

The chances that all sectors across all countries are perfectly aligned, either to each other or to expectations is effectively zero. The risk to investors, then, is not the risk of a well-timed organised or delayed disorganised transition, but rather the inevitable mix of sectoral and geographical versions of these transitions. For example, the maximum risk for a particular investor could be a combination of reduced Chinese demand for coal that hits Australian, Indonesian and South African coal producers, combined with a policy withdrawal from Canadian oil sands, and a failure to manage demand for oil products, that increases oil prices and shifts value from Canada and oil consumers to OPEC and Russia. In other words, a mix of successful and unsuccessful transition elements could be the most dangerous result for many investors, as we found for the country of South Africa, where the largest national transition risk is a combination of concerted action lowering demand for its coal exports, with little action in global oil markets, thus removing the offsetting transition factor for South Africa of lower oil prices.

WTW tracks hundreds of specific geographic and sectoral transitions, which are often only partially or not at all related to each other. The eventual goal for our work is to use data analytics to estimate the probability of each transition happening at a given strength and timing. Only this type of approach will enable us to examine the real-world risk from climate transition(s) for both investors and countries, which comes from the combination/portfolio effects of the components of a transition.

Additionally, this type of probabilistic risk assessment will enable us to determine which specific components or uncertainties with respect to the transition – sectors or geographies – pose the greatest risk to the financial stability of specific markets, countries and the global financial system. With that we can develop policies, risk metrics, financing, and investment strategies that manage that risk, reduce the uncertainty, and determine policy and development priorities.

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