



**Submission on
NZPC's Draft Report
Reaching for the Frontier**

NZ: Prisoner of an Outdated Paradigm

***Joint Submitters
Ifor Ffowcs-Williams
Dr. Doug Galwey
Dr. David Wilson***

***Foreword by
Dr. Christian Ketels, Stockholm***

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1. Foreword: Dr Christian Ketels, Stockholm, Sweden

NZ firms reaching the next frontier: how clusters can help

Countries around the world continue to struggle with the global pandemic. With vaccinations now under way, the focus is starting to shift towards the post-COVID context: how can countries respond now that will help them to not overly get back quicker but also build back better?

The draft report “*New Zealand Firms: Reaching for the Frontier*” produced by the New Zealand Productivity Commission provides important input for New Zealand to address this question.

New Zealand has gained international recognition for its determined response to the pandemic. But simply returning to the pre-COVID growth path would fail to address the challenges that the report very clearly identifies: New Zealand is lagging on productivity, the key element of national competitiveness and ultimately the driver of the level of prosperity the country can sustain. It is lagging behind especially ‘at the top’, i.e., among the best performing firms that define an economy’s productivity frontier.

The specific nature of New Zealand provides some explanation for why the top New Zealand firms lag behind their international peers in size and numbers: The economy is small, remote, and natural-resource based – all factors that make it harder for leading firms to grow and increase their performance.

But a closer look at the data (see also the competitiveness scorecard in the appendix¹) reveals that this is not the entire story: New Zealand is also lagging in competitiveness fundamentals clearly shaped by policy choices. It is relatively weak in innovative capacity and the strength of clusters – these are usually factors that enhance performance at the top and enable dispersion to others.

The draft report makes well-argued recommendations for upgrading policy at several levels. With its discussion of ‘focused’ innovation policy it aims to directly address the challenges of achieving productivity growth in an economy with New Zealand’s particular characteristics.

The submission made here outlines a critical step to further this logic: how to design and implement an innovation policy that is truly ‘focused’. A cluster-based approach has proven a powerful way to do so, especially in other advanced economies that share their small size

¹ See slide 7 in the Appendix, showing NZ’s relative position on an OECD International Competitiveness Scorecard for 2020.

NZ is identified as being below average for ‘Innovative Capacity’ and, in red, the lowest quartile, for ‘Cluster Presence’.

with New Zealand. Clusters represent the presence of ecosystems of companies focused on related activities, co-located in a specific geography. They are a breeding ground for firms at the frontier to harness high performance, and a multiplier where this performance gets leveraged and supported by a broader system of related and supporting firms.

Countries like Denmark show that government can play a critical role in elevating the performance of such clusters through cluster development efforts, connecting firms with each other and with the appropriate set of policy instruments.

New Zealand has traditionally focused on competitive markets and trade openness as a means to drive the efficiency with which the country leverages its natural assets. It might be the time to move beyond this model, not by abandoning the open market-approach, but by supporting it with policies that enable New Zealand firms to successfully compete and grow based on high productivity and innovation.

The proposals made in the draft “Reaching for the Frontier” report, strengthened by the robust cluster-based approach advocated in this submission, can provide clear guidance for progress on that path.

Dr. Ketels has led cluster and competitiveness projects in many parts of the world and has written widely on economic policy issues. He is a frequent speaker on regional and nation competitiveness, cluster development and microeconomic policies across Europe, North America and Asia.

He has served as Head of Michael E. Porters' research team at the Institute for Strategy and Competitiveness, Harvard Business School.

He is currently Visiting Executive at HBS; Deputy Chair, Innovation Fund Denmark; Chair of the Advisory Board, Basque Institute of Competitiveness; Chair of the TCI Network Advisory Board.

2. A Firm is Not an Island

The environment in which our frontier firms, our regions and our national agencies are operating is changing with speed. **New Zealand is not.** Our policy settings seem locked in to path dependencies and undifferentiated and non-specialised sectors. This national approach to economic development limits our ability to learn and limits our ability to innovate.

In the last 35-50 years NZ has been locked into a neo-classical view of its economy and the world, in which we have tried to address market failures through public policy and endeavoured to use increased trading relationships as a strategy to gain growth and competitiveness. However, this has failed to produce the productivity gains that the macroeconomic theory would predict and that we require as a nation.

This submission promotes a new way (for NZ) to approach economic development, addressing innovation, productivity and competitiveness.

It promotes a systemic and evolutionary approach with the ability to learn at different but related system levels: macro-meso-micro (national, regional and firm levels). This relates to functional economic theories in macro and microeconomics but adds a way of better understanding territoriality through meso-economics (regional science, regional studies, and regional economic development) which lean on evolutionary, complexity, endogenous development theories in which macro patterns emerge from micro changes.

As a basis for organising our thoughts around system levels and learning, we have borrowed from the viable systems model. It promotes a systemic and evolutionary approach with the ability to learn at different but related system levels: macro-meso-micro. Each level of recursion (nesting) is a viable system within itself, meaning each level must have the requisite capabilities to respond to the changing external environment that is relevant to that level.

*'It is becoming increasingly apparent that it matters much less who reports to whom, as who needs to talk with whom and how all the pieces of a complex interrelated jigsaw fit together to form a synergistic whole. Yet it is precisely this sense of the whole that is so often missing.'*ⁱ

This approach allows us to untangle the different system levels for innovation (national, regional and within the firm) and assemble institutional arrangements to gain learning that can be shared at each level and within the system as a whole. In short, it provides a way to improve policy through fine grained learning and become more responsive and proactive in increasing New Zealand's innovative capacity and productivity growth.

At the meso level many related tools can be implemented to improve innovation and productivity (clusters, regional innovations systems, smart specialisations, learning regions) and it is here that we have been negligent as a nation both in learning from ‘similar others’, such as advanced small economies, and from supporting strengthened regional institutions that can support these types of interventions. This weakness has hampered well intentioned policies and our ability to execute.

We have been unsophisticated in our approach to economic development and somewhat self-satisfied with our resource-based and commodity exports, that have provided us with comfortable growth in the last century and a half. But as the NZPC has rightly highlighted we are slowly falling behind in our international competitiveness and export sophistication and, as a result, productivity growth which is at the heart of building prosperity.

Shaping the Change To transform, however, we need to accept that much of our thinking has been locked into old ways of thinking, old paradigms, when our environment is changing, and our economic theories are evolving. Businesses now more than ever need a social license to operate and seismic shifts are happening due to global issues such as inequality, climate change and pandemics. A simplistic contrast is easily demonstrated in the table below.

	Old Paradigm	New Paradigm
Environment	Slow changing industrial environment; Taylorism Returns to shareholders Innovation within the firm Sluggish responses	Volatile, Ambiguous, Complex, Uncertainty Rapid adoption and change, Returns to society and the environment Holistic systems thinking, innovation within networks Recursive learning at speed
Economic Theories	Neoclassical/neoliberal	Institutional, Evolutionary, Complexity, Green, Economic geography, Doughnut

Moving from an old paradigm, locked-into particular path-dependencies, requires new ways of working, systemic ways. The NZPC response is taking an incremental approach to productivity growth by attempting to broaden our meagre roster of frontier firms. While this is an important focus, we believe it cannot be achieved without attention to the ecosystem within which they operate.

There is a mismatch between our current policy prescriptions for productivity and our institutional and economic environments. **Transformation is required, not fine-tuning.** Responding to this mismatch demands coordination and alignment at three levels: Macro, Meso and Micro.

The centre piece in transformation is MESO, providing the link between Micro and Macroeconomics, the connector between bottom-up and top-down, between the firm, clusters and national productivity. It is here that NZ lacks the capacity and the institutions to drive change, it is here that learning is needed to influence policy, where institutional innovation is required, where triple helix partnerships and innovation systems can be facilitated, where vertical and horizontal integration can be achieved, and where policy alignment and coordination can best be achieved to increase productivity.

Responding to Change The fundamental levers of change are paradigm and mind set changes. Learning systems at three levels, micro, meso² and macro, by aligning provide the necessary feedback mechanisms for continual system renewal and learning.

The NZPC draft does not adequately take into account Teece's fundamental point, highlighted in bold at the front of his paper: ***'The competitive strength of national industries depends on the abilities of the core firms to function effectively and to maintain and enhance their integrated learning bases'***.ⁱⁱ One of the founders of the concept of learning organisations, Arie de Geus, over 30 years ago identified: *"Institutional learning is more difficult than individual learning"*.ⁱⁱⁱ

From the bottom up, firm level, demand driven systems have the capacity to absorb high levels of complexity. However, systems need to be in place to capture and aggregate learning and connect to similar firms with similar challenges and opportunities at a higher level of recursion – in networks, clusters and innovation systems. This sophistication is missing in our current system of business support and present in other exemplar SAEs. It limits our ability to break the productivity paradox that we are locked into.

Frontier firms operate within ecosystems. Whereas neoclassical endogenous growth theory concentrates on the firm, and how innovation is produced within it, endogenous regional economic development (meso level) attends to wider ecosystem dynamics that provide the context for firm success. They are not mutually exclusive, on the contrary, they should be mutually reinforcing. This higher level of recursion lacks emphasis in NZs policy and economic development capacity and capability.

The following table outlines some of the mindset changes that are needed and where enhanced feedback loops, leadership and communication need to be upgraded.

² There is a raft of 'Regional Learning' literature related to the tools supported here, from Florida R (1995) *'Toward the learning region'*, and Asheim BT (1996) *'Industrial Districts as 'Learning regions': a condition for prosperity'* to Farinha, et al (2020) *'Regional Helix Ecosystems and Sustainable Growth'* for example.

	Current Situation	Emerging World
Micro The firm	Vertically integrated, self-contained firms; hierarchy Focus: the domestic market 'Low-road' to growth, lowering costs, with a few ocean liners	Specialised, networked firms; devolved management Global players within niche markets 'High road' to growth, enhancing value, with 1001 speedboats
Meso The region	National sectors, associations Wellington driven regional projects Picking winners Innovation happens in the firm REDAs: under-resourced, reacting and contract-driven	Regional clusters, regional innovation systems, smart specialisations Differentiated, joined-up support to regions centred on specialisations Backing leaders, improved governance Innovation happens within systems REDAs: conductors, brokers, facilitators
Macro National	Exogenous growth Financial inducements Investment attraction Siloed, top-down interventions Job creation programmes Hard infrastructure Top-down generic activities	Endogenous growth Learning Start-ups & grounded scale-ups Multi-agency integration; subsidiarity Long-term business development Soft infrastructure, knowledge ecosystems Bottom-up tailored support

We address the three levels of recursion – macro, meso and micro – separately in this paper, but highlight the importance of connections and feedback loops between these levels. Institutional learning, leadership and communications are the three essential ingredients of successful transformation.^{iv}

NZ's innovation system exhibits systemic failure. The NZ situation mirrors the transformative system failures identified with the Danish innovation system, as categorised in the following table taken from page 53 of the Danish review (Ketels et al 2019^v). All the systemic factors listed are change management considerations and describe a system incapable of learning. It has no dynamic capability per se, the very focus we are putting on firms (Teece 2020^{vi}).

While the NZPC has 4 central recommendations addressing transformative aspects, a majority of its 22 recommendations are centred around institutional, network and capability issues. We therefore have provided suggestions in the rest of this submission as to how we might address some of our system failures and provide an enabling context for new and or strengthened frontier firms.

Classification of Innovation Failures			
Market Failures (Neoclassical Perspective)	Structural System Failures (Innovation system failures)	Transformative System Failures (system innovation perspective)	NZPC Recs.
Limited Experimental Economy Weak incentives, information asymmetries and capability deficiencies limit ideation and experimentation	Infrastructural failures Underinvestment in infrastructure due to large uncertainties, high risk, big scale and long-time horizons	Directionality failures Weak incentives, lack of common vision and weak actor mobilisation stop system transformation	R2.1 R7.1 R7.2
Underinvestment in R&D and innovation Genuine uncertainty about results and appropriately make cost-benefit calculus impossible	Institutional failures Laws, property rights, regulations, values, norms and attitudes could generate negative incentives	Demand articulation failures Weakly articulated user and societal needs and weak demand articulation capabilities limit system renewal.	R7.2 Top down
Negative externalities Societally negative effects if private actors do not have incentives to include such costs in their calculations.	Network failures Weak cooperation limits knowledge exchanges, learning and empowerment – too strong clusters could lead to lock ins.	Policy coordination failures Under-developed processes for multi-level and horizontal policy coordination limit system renewal	Not specified
Overexploitation of societal commons Societal commons-land, water, environment tend to be overexploited (if they are not priced)	Capability failures Lack of key competences, leadership and organisational capabilities limit absorption of new knowledge and innovation.	Reflexivity failures Under-developed systems and renewal perspectives in policy evaluation and policy learning limit system renewal.	R7.5

To conclude we agree that there are currently directionality failures, demand articulation failures, policy coordination failures and reflexivity failures hampering New Zealand’s innovative capability and capacity.

We also believe that a firm (frontier or otherwise) is not an island, it sits within an ecosystem both geographic and economic.

A national innovation system is just words without the pillars and platforms at different nested levels. As innovation is demand driven these levels are critical and a national effort needs to be supportive rather than top down or government driven. Focussed innovation, of the kind that will increase New Zealand's productivity as a whole, does not align with a national innovation system, a national innovation system aligns with it.

Therefore, our recommendations are few but their implications, in terms of execution, are significant. We sincerely hope that New Zealand takes innovation and productivity seriously. Our future prosperity and competitiveness rely on this.

Recommendations

- 1. Build capacity and capability at the regional level to facilitate and orchestrate regional innovation systems, clusters and smart specialisations.**
- 2. Support increased effort at the regional level to provide stronger business growth and innovation support to firms via the Regional Business Partnership.**
- 3. Improve governance, horizontal and vertical integration to improve learning, policy development, and delivery of government programmes.**
- 4. Power up regional economic development agencies to achieve 1, 2 and 3 above.**
- 5. Treat the national innovation system as the support platform for focussed demand-driven innovation systems.**

3. Macro: Overcentralised and Underdelivering

*‘We do not have a policy or strategy problem in New Zealand; **we have an implementation problem**. Well thought out strategies are everywhere, and smart policy makers abound. Our tactical implementation however is incoherent’. David Wilson ^{vii}*

*‘Smart strategies alone will not be sufficient; **execution is crucial**. The Government should partner with other stakeholders to put in place effective arrangements for the governance, resourcing, implementation, monitoring and evaluation of its strategy. Senior political and public service leadership is also needed, to unlock resources from across government agencies.’ NZPC Draft 2020, p. 93.*

*‘It is not so much the quality of New Zealand’s macroeconomic or financial settings or our diplomatic skill in developing new trade relationships that has led us to this point. It is more to do with the execution of economic development policies. Macroeconomic settings, monetary, financial and fiscal policies only provide the context for what really needs to be done. To improve productivity at the same time as sustainability and inclusiveness requires work at the coal face; one business, one cluster, one industry, one sector, one community and one region at a time. It requires a **whole-of-government systemic approach** from policy to implementation and back again through feedback loops. It requires different levels of systemic action.’ (Wilson, D, *ibid*).*

In our view, implementation requires coordination at national, regional (meso), cluster and firm levels. At each of these levels different theories and practices need to be orchestrated and implemented. The firm and cluster level can best be orchestrated and supported at a meso, regional level.

We agree that frontier firms are crucial to productivity growth, and that they are more likely to export and innovate. We also agree that specialised, distinctive, and / or knowledge intensive goods are needed and that our export mix needs more complexity to add value.

Where we differ from NZPC is in the systems and implementation capability and capacity needed to support these goals. Transformative change will come when we move from our customary sledgehammer approach at a national level, to a much more granular and tailored approach at the regional level, using the equivalent of a tack hammer.

The notion that New Zealand is geographically challenged is patently true. It has determined our historical development. From the moment that refrigerated exports became possible, for example, a whole new set of opportunities opened for New Zealand exports.

At the forefront of economic development practice is the consideration and combination of geographic with economic factors. Geography, however, is not just considered in the physical sense. One may also consider the economic, human, social and relational geographies. When these are combined with functional economic theories like endogenous, institutional and evolutionary economics, which invariably include systems, complexity and management theories the fun begins, and new insights are gained.

At the forefront of these kinds of considerations is Regional Economic Development (RED) theory and practice. It is self-evident the name 'regional' 'economic' development that territorial dynamics are considered with functional economic theories of development. RED differs in practice internationally at subnational levels due to political, geographic, social, cultural, environmental, and economic factors. However, there are common practices, tools and theories that cross jurisdictions and cultures and allow for regional differences and variations to accentuate development.

Maori economic and firm development is rohe-based and Maori completely understand the connection between the whenua and well-being, and by extension between people, the land and economic development. The welcomed discussion of Maori business networks in the NZPC draft is not surprising given these dynamics.

Unfortunately, RED is largely absent from the NZPC consideration of frontier firms and productivity growth. **It is as though NZPC view frontier firms as existing in a geographic vacuum.**

This is a mistake that ignores a whole set of regional development theories and practices which include clusters, smart specialisations, innovation systems and learning regions. Regional innovation systems (RIS), for example, consider geographic factors and regional economies together and acknowledge the system effects by cluster, region, nation, and global value chains. They also consider the approach to triple, and more latterly quadruple, helix arrangements within regions and how different actors can be brought together to enable connectivity and innovation.

Frontier firms do not exist in a vacuum. They are nested in networks, industries, sectors, supply chains and a tight geography of relationships, and, most often, innovators. When digital communications are observed, for example, the incidence of communication rises with proximity. So, while ICT has advanced global communications, social and relational connections still count. This is especially so when complex and tacit information is to be exchanged for innovation.

New Zealand's geographic factors present us with a combination of global/national and national/regional characteristics. However, regions differ in their economies and

specialisations and by type; rural, city and tourism, for example. City-regions are often thought to have innovation advantages due to the fact they are likely to have a more diversified economy, more innovation assets (universities, research organisations, large firms, critical mass, finance and advanced institutions) and dense cultural and social interaction allowing for a higher “bump” [into] factor, and opportunities to explore white spaces³ and related variety⁴. Rural regions, on the other hand are more likely to be involved in goods production (e.g. agriculture, horticulture, forestry) with less diversified economies, where development may require a small set of deep specialisations built on comparative and competitive advantages.

Interventions, therefore, need to be part of an overall economic plan but nuanced to take advantage of differing economic geographies and characteristics. In short, a more subsidiary place-based approach. A national innovation systems approach, by industry sector, pulls against and may ignore regional differences and specialisations and yet this is where the gold is. While RISs can focus on fine grained and specialised innovation at firm and cluster levels, NISs can work to provide connections and support to RISs through policy and regulation and by connecting large centralised public institutions like MBIE, NZTE, MPI, Callaghan Innovation, CRIs, schools, polytechnics and universities to the RIS effort.

Agritech, for example is fine as a national strategic sector to develop, given our history and revealed competitive advantages, but what is/are the particular specialisation/s that produce a sustainable long-term advantage, and which will attract firms, researchers and investment? These can best be orchestrated at a regional level, through RISs, clusters and smart specialisation practices.

Ubiquitous digital technologies are not enough to gain advantages and knowledge intensive specialisations, all OECD nations have them, it is the special combination of people, firms and researchers that transform ubiquitous technologies into specialised marketable products and services. This happens in a place, with people.

Technology diffusion is not a one-way transaction. Innovation and technology diffusion can happen between frontier firms and suppliers, collaborators, and competitors within RISs, clusters and networks.

We agree that attracting MNCs and FDI needs to be strategic, adding to our development aspirations and becoming part of our clusters. So inward investment needs to be led by those that know their patch, what is strategic, what is needed, who to work with, connections to be made, skills required, capacity and capability gaps to be filled, and opportunities available. In short, these related functions need regional “conductors”.

³ The space between different industries and technologies and new opportunities

⁴ Where adjacent clusters and technologies can be explored

Regions provide the intervention level at which relationships are close enough to support and facilitate and where there is enough critical mass to make a difference at a national level. Whereas national innovations systems will be beset by information asymmetries, high-level goals and diffuse interventions.

We believe that a key level of innovation and implementation capability and capacity is missing from the NZPC draft, in order to support the growth of frontier firms in New Zealand. That is a regional component that can orchestrate much of what is suggested in the NZPC draft. But it needs to be powered up. ^{viii}

Regional Economic Development Agencies (REDAs) have continued to be under-resourced by central government with local and regional governments primarily picking up the tab for the function. With the lion's share of funding and resources for RED sitting with central government agencies and officials, this creates a lack of trust, opportunities for duplication and misalignment, and a top-down siloed approach that can miss or ignore local context, knowledge, experience, and other endogenous place-based factors.

The work required of REDAs does not fit neatly within the current core services performed by local and/or regional government, despite re-incorporating the 'four well-beings' into local government mandates, as they are fiscally challenged at every turn delivering core services and acceding to central government expectations. This has created an environment for the continual review and re-examination of the RED function and a tendency toward gearing REDA activities toward short term local government priorities⁵ over long term national RED functions and priorities, such as innovation and productivity growth.

The nature of RED work is that it is both a national and regional undertaking. It fits at the meso level between national and local/community development, taking advantage of opportunities within macroeconomic policy settings and exogenous forces. Fundamentally the goal of RED is to diversify and/or strengthen a regional economy, in the public interest, aligned with nationally strategic goals and aspirations. This requires a far more sophisticated and integrated approach than what we currently have.

Regions have different strengths and weaknesses and start development efforts from different platforms but are interdependent and together make up the national economy. Growing Northland's economy, for example, is intimately related to Auckland. Many of the wider effects of Auckland's growth are felt in Northland and Northland provides opportunities to address Auckland's growth. There are also many mutual opportunities for economic development and the geo-political demarcations are not always helpful. What is

⁵ See Hutchings and Garland (2019) for primary research into the challenges and opportunities for RED in New Zealand

of more importance in regional economic development is the *economic geographies* - local productive systems and functional economic connections.

If government were to take an endogenous RED approach, such as focusing on frontier firms, cluster development, smart specialisations and productivity growth, much more effort would need to be put in to building local human capital, institutions, leadership, and innovation to diversify and strengthen regional economies.'

In response to the commission's Q7.1 *How could Callaghan Innovation and New Zealand Trade and Enterprise (NZTE) best marshal a proportion of their resources to build the innovation ecosystem of firms operating in areas chosen by the Government for focused innovation policy? How would this fit with their current services to individual firms? How should responsibility for this approach best be shared between Callaghan Innovation and NZTE?*

NZTE and Callaghan Innovation have differing but complementary mandates. At a regional, cluster and firm level, looking back to central government functions and navigating these is difficult and time consuming. Furthermore the 'firm only' approach by both creates confusion and isolation. Firms exist in a context and a place not a vacuum. A one-stop-shop in regions, REDAs, would be helpful in providing a user-led response. The Regional Business Partnership (RBP) and the functions within it need reviewing, yes, but as the Covid-19 response demonstrated these programmes and connections are extremely valuable and need to be ramped up and devolved to REDAs. (For governance and operational arrangements see Wilson D., 2020)

NZTE is primarily outward and export focused, the RBP is an inward domestic focus and has traditionally been more of a contractual relationship with regional partners than a 'partnership'. More recently NZTE has placed more emphasis on capability building for their regional partners. In practice, working with NZTE at a regional level is a good experience, especially in export promotion and inward investment. Because of the different foci within NZTE (outward versus inward) we believe that the RBP could easily be devolved to regional partners (REDAs) with a set of outcome measures, for example related to frontier firms and productivity, alongside process measures.

Callaghan has a similar set up in that certain programmes are delivered, in a tight contractual relationship, regionally while other services are provided to individual firms directly, in regions, in isolation. Once again confusing and incoherent for firms, clusters and regions.

As regions are the best level to at which to orchestrate delivery of government programmes, more needs to be done at the meso / regional level to support business, innovation and cluster development.

4. Meso: Powering up our Regions

Shaping the Issue In responding to our productivity paradox, there is much to be addressed within the boundaries of each business, but also beyond those boundaries. Some of the responses for aspects beyond a firm's boundary are generic to all, such as R&D tax credits, IP regulations and export market access. Other aspects are more focussed on specific groups of firms, such as training kiwifruit packers, marine engineers or timber processors. There are clearly regional concentrations of such employees in NZ, they are naturally clustered. It is at this meso-level that productivity and competitiveness particularly need to be addressed. It is at this level that a focussed innovation strategy comes into play.

Each of the small, advanced economies that NZPC refer to have developed a very granular focus on regional clusters that over time have supported the emergence of their frontier firms. **In New Zealand, we have not.**

These countries, and many others, draw on multiple strands of evidence that strong regional economies are centres for clusters and specialisations. Whilst robust evidence has built up over decades, this is not reflected in the NZPC draft report. Evidence that NZPC could draw on includes:

- Alfred Marshall observation that in regional concentrations of economic activity *'the mysteries of the trade become no mysteries; but are as it were in the air'* ^{ix} ;
- Jane Jacobs' insight in **Cities and the Wealth of Nations** that *'Cities, not nations, are the key economic unit'* ^x;
- Michael Porter's clarity in **The Competitive Advantage of Nations** that frontier firms are not randomly scattered within a nation, but are geographically clustered ^{xi};
- Giacomo Becattini's emphasis on social proximity and *'a sense of belonging'* within Italy's industrial districts ^{xii};
- AnnaLee Saxenian's **Regional Advantage**, contrasting Silicon Valley's dynamics with the (then) dysfunctional Boston region ^{xiii};
- Edward Glaeser's **The Triumph of the City: "Innovation clusters in places like Silicon Valley because ... ideas cross corridors and streets more easily than continents and seas"** ^{xiv};
- Charles Landry's **Cities of Ambition**, encouraging cities to identify and orchestrate their unique resources ^{xv};
- Greg Clark's **Global Cities**, with cities focusing on niche opportunities within the traded sectors and cities accepting the remoteness of national governments ^{xvi}, and
- OECD's **Framework for Rural Development**, advising regions to focus on core areas of advantage and to continue to specialise ^{xvii}.

More recent evidence, subsequent to NZPC releasing the draft report, includes:

- OECD's Regional Development Paper, demonstrating that *"cities with high levels of government quality and local autonomy but low horizontal fragmentation tend to be the most productive."*^{xviii}
- Christian Ketels' European research confirming the relationship between clusters and positive economic outcomes^{xix}.

As David Skilling identifies: *"Dense clusters are the core of dynamic, resilient economies that operate at the global productivity frontier, such as Switzerland and Denmark."*^{xx}

The accumulated evidence is clear: even 'weightless' frontier firms (as in Hollywood, Bollywood and Wellywood) are grounded within strong, regional clusters. Spillovers and the diffusion of tacit information has a tight geography.

Clusters provide a well-tested framework for more focussed public engagement. Related frameworks include value chains, smart specialisations and regional innovation systems. Amongst these complementary approaches, it is cluster development that particularly provides an overarching approach and, importantly, a practical delivery mechanism for upgrading competitiveness.

International Perspective Clusters are a natural occurrence; cluster development is a deliberate intervention to raise the cluster's competitiveness. Across Europe, with proactive support from public agencies, well over a thousand regional clustering initiatives are underway.

Clustering Initiatives in Small, Advanced Economies Examples of Relevance to New Zealand

Belgium – Antwerp: Logistics & Transport (VIL) cluster; Brussels: Energizing the Future, Flanders' Food; Limburg: Bike Valley; Oostende: Blue Cluster
Denmark – Arhus: Wind Energy; Copenhagen: Fintec, Maritime & Logistics, Medicon Valley; Odense: Robotics, Welfare Tech; Herning: Lifestyle & Design; Struer: Sound cluster
Estonia – Tallinn: Wooden Houses; Connected Health
Iceland – Reykjavik: Oceans, Renewable Energy / Geothermal, Tourism Cluster
Netherlands – Wageningen: Food Valley; Horn: Seed Valley
Norway – Bergen: Ocean Technology; Møre: Blue Maritime; Hordaland: Seafood Innovation; Trondheim: Ocean Autonomy Cluster; Oslo: Cancer Cluster
Sweden – Mälardalen: Robotics Valley; Hudiksvall: Fiber Optic Valley; Uppsala: Life Sciences; Växjö: Smart Housing; Värmland: Paper Province; Gävleborg: GIS cluster; Jämtland: tourism/sports/outdoors; Örnsköldsvik: Biorefinery of the Future; Småland: Smart Housing.

In addition, within the larger European countries, many regions and cities are financing cluster-centred economic development, including Catalonia & the Basque Country; Baden-Württemberg & Bavaria; Hamburg & Berlin; Gelderland & North Brabant in Netherlands; Auvergne-Rhône-Alpes in France; Bern Canton in Switzerland and Skåne in southern Sweden. Similarly, beyond Europe, many regions have cluster support in place, including Quebec, Medellin (Colombia), Western Cape (South Africa) and Queensland.

Frequently, these clustering initiatives have 5 years of public co-funding, at times 10 years. For many clusters, annual co-funding from public agencies is around \$250,000 - \$1.5 million/cluster. Canada's five superclusters are each receiving \$150 million over 5 years from Ottawa.

Each of these clustering initiatives has a formalised structure in place, usually a not-for-profit entity that is business led with governance that includes other senior triple helix players.

With this level of activity around the world, the cluster development approach has been well tested and refined. Many countries have two to three decades of experience that NZ can now benefit from. Cluster Navigators Ltd have published a cluster development handbook that draws on their hands-on experience in over fifty countries ^{xxi}.

Cluster Development in Practice Most clustering initiatives have in place a small secretariat as the cluster's connector and the catalyst for growth. This is where public funding is particularly applied. While development agendas are specific to each cluster, frequent aspects include:

Frequent Cluster Development Activities

Building the cluster's community: Removing firm and support organisation isolation; increasing the circulation of tacit information, spillovers, diffusion of ideas and practices; development of informal and formal links amongst businesses, removing clumps; enabling businesses where relevant to hunt as a pack (export development, responding to Covid-19, addressing skill gaps ...); building a co-opetition culture, formal and informal networks; co-specialisation amongst businesses; enabling businesses to learn from each other; aligning often a clutter of support organisations around business needs; helping firms navigate through support agency clutter;

Skills development: Needs-driven technical & management training; needs-driven tertiary course development; graduate projects with the cluster's businesses; school partnerships.

Technology: Needs-driven, collaborative, R&D; R&D centres; university links; technology mapping, forecasting.

Start-ups & scale-ups: Specialised incubators; seed funding and venture capital.

Internationalisation: Establishing international connections; cluster branding; export development; knowledge links with related international institutions; cluster-to-cluster links; talent attraction; targeted investment attraction to address ecosystem gaps and to import exporters; international student attraction within the cluster's domain; outward investment, especially to related clusters & knowledge centres.

Physical infrastructure: Cluster specific incubators, precincts, technology parks, centres of excellence, one-stop-service-centre, common user facilities.

Finance: Equity and debt funding, venture capital, angels, seed funding.

Cost reduction: Joint purchasing of raw material, services, transport ...

Through meso-level initiatives, regions are assuming roles that were the province of national agencies. Similarly, within NZ, cluster development activities could address, with a very granular approach, many of the NZ business development constraints identified in the draft report.

There is emphasis around the world on building a cluster's **specialised physical infrastructure**, such as cluster-specific incubators and precincts. This is a relatively quick-fix aspect of cluster development. Building a cluster's **specialised knowledge infrastructure**, with coordination from high schools to vocational training, graduates, PhDs and public R&D, takes longer and is more essential. Even more critical, complex and longer term is building the **social infrastructure**, the personal relationships. As cluster development is fundamentally about behaviour changes, many public agencies are committing to long-term support.

No regional cluster is a self-contained unit. Clusters provide building blocks to connect businesses, especially SMEs, and support organisations:

- To related clusters within their region, as components within the region's innovation system, and often drawing on underpinning smart specialisations.
- To related clusters within the country, facilitating well informed, bottom-up national agendas. Clustering initiatives in Netherlands, Sweden and other countries are also drawn on for national-level, mission orientated approaches in addressing grand challenges.
- To related clusters globally. The EU is placing considerable resources into connecting clusters^{xxii}, for example linking Europe's healthtech clusters (and their SMEs) with Bangkok's healthtech cluster.

The firms within a region are not equal in terms of their growth prospects, and not equal in terms of meriting public support. Engagement within a region at the cluster lever firstly places priority on those firms within the traded clusters. Secondly, it enables the frontier firms within those clusters to be prioritised, the 'shakers & movers' that have both the ambition and the competencies to grow. These are the firms where employment growth is most likely to occur. These are also the firms that may not automatically reach out to

existing support agencies, but often have common opportunities and face common roadblocks to the other firms within their cluster.

NZ's Current Situation We already have many regional clusters with an international reach ... Go-To places with established reputations for products, services and know-how. Many of our frontier firms are embedded within these ecosystems. However, while these regional clusters are already receiving government support, this support is often short-term and not coordinated as in the reference SAEs. It is being drip fed by a multiplicity of agencies. NZ lacks any substantial coordinating mechanisms and institutional structures around these regional specialisations. Any coordination is informal.

Region	A regional specialisation with an international reach	Specialised support: Examples, organisations & projects receiving national funding
Auckland	Food processing Marine Medtech	FoodBowl; High Value Nutrition Challenge, Auckland U Viaduct; Yacht Research Unit, Auckland Uni Auckland & Waitematā DHBs; MedTech CoRE, Auckland Uni
Waikato	Dairy agritech	Ruakura Centre; Mystery Creek
Bay of Plenty	Hortech Freight Logistics	PlantTech Research Institute Toi Ohomai Institute of Technology - Logistics Training Centre
Rotorua	Forestry	Scion HQ; Te Papa Tipu Innovation Park; Toi Ohomai Institute of Technology - Forestry Management
Taranaki	Energy	National New Energy Development Centre; Bioenergy Association; EnergyStream; WITT – School of Engineering & Energy; Inglewood High School
Manawatu	Food science	Food HQ; Riddet Institute; Massey University; UCOL; AgResearch; Plant & Food; Food Pilot Plant; Rural Innovation Lab; NZ Agriculture Greenhouse Gas Research Centre; NZ Food Safety Science & Research Centre; Incubators - Sprout Agritech & The Factory
Wellington	Digital	Creative HQ incubator; Victoria Uni Film Programme
Marlborough	Sauvignon blanc	Bragato Institute; NMIT - viticulture & winemaking
Nelson	Blue economy	Seafood Research Centre (Plant & Food CRI); Cawthron Institute; Cawthron Aquaculture Park; National Alge Centre; NMIT - Maritime engineering
Christchurch	Healthtech	Te Papa Haoura, the Health Precinct; Canterbury DHB
South Canterbury	Vegetable seeds	Lincoln campus ... Agresearch HQ; Landcorp HQ; Lincoln Ventures; Bio-Protection Research Centre
Dunedin	Healthtech	Southern DHB; Otago School of Medicine

Further, our regional ecosystems have dysfunctional support, with an emphasis on engaging with individual companies rather than groups / clusters:

1. **National agencies**, active with larger firms/exporters: MBIE, NZTE (with Focus companies, and collaborative networks), Callaghan (support to individual businesses for graduate scholarships, project grants, start-up grants...), TPK, MPI.
2. **Regional EDAs**, emphasis on 2nd tier firms within the traded economy, suppliers to the larger exporters and emerging exporters.
3. **Chambers**, servicing the support companies to #1 and #2, and the domestic side of regional economies.

NZ's Forward Agenda If there is serious intent to address NZ's innovation paradox, then substantial changes are required. **This requires a change in implementation, not necessarily an increase in public investments.**

While Wellington has not passed its used-by date, capital cities are less relevant today when seeking to move with scale from commodities to differentiated and value-added products and services. The NZPC draft identifies that tighter coordination is needed amongst national agencies. However, where this coordination really matters is within our regions, fine-tuned around the specifics of each of the priority traded clusters. This degree of coordination cannot be micro-managed by Wellington staffers day-tripping into the regions.

While national agencies have the resources to prepare '*Industry Transformation Plans*', such high-level, top-down plans are at risk of disappointing the funders, and more importantly the participating businesses. More relevant in building a high value economy would be '*Regional Transformation Plans*' centred on the traded economy and regional clusters, placing emphasis on incremental engagement and learning-by-doing. Unfortunately, few NZ regions have the resources to undertake such bottom-up activities.

Effective cluster-based economic development requires local partners. Regional Economic Development Agencies (REDAs) can step-up to be that partner. However, the draft report currently fails to (1) recognise the tight geography of innovation and (2) that our REDAs are under resourced relative to their SAE equivalents.

Cluster Navigators' earlier submission identified key principles for consideration in designing a national NZ cluster support programme^{xxiii}

Cities and Regions Ltd have outlined how the mechanisms and institutions (REDAs) could be improved to increase productivity, sustainability and productivity in regions^{xxiv}

5. Micro: Building Tomorrow's Frontier Firms

The frontier firms of the future will increasingly be defined by their organisational learning capability. They will exhibit the requisite management skills and systems for building growth engines (capabilities) that balance the competing demands of running existing businesses and building new ones ⁶.

'The competitive strength of national industries depends on the abilities of the core firms to function effectively and to maintain and enhance their integrated learning bases'. (Teece^{xxv})

Given the research and consultation undertaken during the NZPC Inquiry, it is disappointing there were few insights into the whole process of managing for growth, i.e., achieving scale.

Shining Light into the "Black Box" of the Firm We outline here a number of contributions which we have found in our practical work to be valuable. These can assist in building a common understanding amongst multiple agencies, at the national and the regional levels, on firm level growth.

The framework does not need to be complex. In its most basic form, the firm can be viewed as the nexus of incentives, information and capability, with the requirement that the emergent structure should be adaptable, promote decentralised decision making and voluntary contracting.

Teece (op cit.) advocates the use of strategic management models which are at the core of business school teaching, an approach rich with insights into the process of business growth.

A foundation framework is the resource-based view of strategy, made popular in the 1990s by Gary Hamel^{xxvi} and C K Prahalad^{xxvii}. Over the last 30 years the research base for this work has flourished as is evident in the work of Teece^{xxviii}. He notes: *"The application of capability theory allows intellectual blinders to be removed and an understanding of differential firm-level resource allocation and performance to emerge. This brings a richer conceptual understanding of the nature of the business enterprise and its management consistent with evolutionary and behavioural economics. Policy insights into governance, inequality, economic development and the wealth of nations follow"*.

⁶ This note builds on an earlier submission by Doug Galwey. The reader is encouraged to read that submission in conjunction with this as it also identifies some quick win initiatives.
<https://www.productivity.govt.nz/assets/Submission-Documents/technology-and-the-future-of-work/dd23ec394c/Sub-012-Doug-Galwey.pdf>

Two related streams of work provide further detail. The first is by McKinsey & Company and is based on a two- and half-year global research. McKinsey had a major focus on building growth engines within the context of the other factors, drawing on (Baghai et al 1996^{xxix}) and (Baghai et al 1999^{xxx}) and the ‘three pillars of growth’.

McKinsey’s approach has many advantages as an integrating framework:

- It offers a way of thinking about growth that balances the competing demands of running existing businesses and building new ones, and that it offers a language that leaders at all levels of an organisation can use. It is called the “three horizons” of growth. These are extending and defending the core business, building emerging businesses and creating viable options. (See Figure 1, Growth Engines).
- It puts growth in a management context, and makes it possible to address the issues of inertia and maintaining growth. It addresses the elements of capability platforms, linking to Teece’s dynamic capability (Teece 2020^{xxxi}), and the resource based view of strategy.
- It applauds the importance of passion - growth is not a mechanistic formula driven process.

A second stream of work emanates from the Beyond Budgeting Round Table (Hope & Fraser 2003^{xxxii}), (Bogsnes 2009^{xxxiii}), (Hope & Player 2012^{xxxiv}) in the UK. This work focuses on dynamic performance management and its governance implications. The table below is taken directly from research undertaken at the Beyond Budgeting Round Table^{xxxv}. It reflects the paradigm shift required to meet the emergent challenges and opportunities in the external business environment. Tomorrow’s frontier firms need to adapt to these challenges, the challenges of an innovation age.

Toward the Innovation Age Management Model

	Industrial Age Beliefs	Innovation Age Beliefs
LEADERSHIP MODEL		
Leadership and Governance	Success is meeting short-term targets	Success: sustainable relative improvement
	Leaders pander to analysis	Being the best is paramount
	Rewards based on short-term results	Rewards based on long-term results
	Control is compliance with a plan	Control is knowledge of today & tomorrow
	Leaders plan and control	Leaders inspire and challenge
Organisations and management	Planning and decisions are centralised	Planning and decisions are decentralised
	Functions are key value creators	Self-managed teams are key value creators
	Mission and vision statements empower	Purpose and values empower
	Rewards are based on individuals	Rewards are based on teams
	Appraisals are annual & control-oriented	Appraisals are continuous and adaptive
PERFORMANCE MANAGEMENT MODEL		
Strategy	Strategy is a destination	Strategy is a direction
	Strategy tools and maps are focus	Learning, adaptation and renewal are focus
	KPIs support strategic control	KPIs support rapid response
	Financial capital is management focus	Intellectual capital is management focus
	Knowledge sharing is IT driven	Knowledge sharing is relationship driven
	Outsourcing is about cost reduction	Outsourcing is about flexibility
Planning and information management	Tighten compliance and control is aim	Cut detail and complexity is primary aim
	Planning is annual and fixed	Planning is continuous and adaptive
	Budgets are central to management	Rolling forecasts central to management
	Resources are allocated annually	Resources are prioritised dynamically
	IT systems reinforce control	IT systems empower and inform
OPERATIONS MODEL		
Marketing & customer service	Product knowledge is paramount	Customer knowledge is paramount
	CRM systems drive sales	Relationships and service drive sales
	Maximising sales is focus	Strategic and profitable customers is focus
	Customer satisfaction scores are focus	Customer loyalty is focus
	Customer service is a cost centre	Customer service is a value-driven system
Operations & process improvement	Process improvement is based on tools	Process improvement is built into the work
	Lean thinking is a toolkit	System thinking is a philosophy
	Information is separated from the work	Information is integrated in the work
	Managing people and budgets is focus	Managing flow and variation is focus
	Managing standard (unit) costs is aim	Managing value stream (total) is aim

This table sets the agenda for change across leadership, performance management and the operating model and brings into sharp focus the pivotal role of leadership. This is where the mindset reframing sits. Unfortunately, this is where NZ's greatest weaknesses are, at all levels.

Other work can further enhance the richness of this core, including Jim Collin's "Good to Great" (Collins 2001^{xxxvi}).

Taken together, such sources provide a sound base for building a forward looking micro-analytic approach. There are likely to be leading indicators of emergent change that could enable more speedy policy responses. (Long before the impacts are reflected in StatisticsNZ surveys). Overall, this framework could be populated with disparate pieces of research on specific aspects and the rich stories from people at the front line.

Putting the Framework into Practice At the macro level each business facing agency can make their policy linkages via the growth engines. For example, NZTE could tree off the opportunities pipeline in looking for future export markets. The next level of detail would reflect their operating model.

Connections to the Meso Level There will be multiple points of entry via connected communities (soft and hard networks) and the associated resource leveraging in building growth engines.

More Targeted and Timely Policy Adjustments The rich insights on all aspects of firm level growth will only be gleaned from the people on the ground and from their relationships with their clients. This is the grass roots, bottom-up approach. The challenge for each business facing agency (including NZTE, Callaghan Institute and the REDAs) will be to develop knowledge management systems such that the rich tacit stories being accumulated from different perspectives can be codified, with patterns identified at the meso level and feed-back provided into the policy /strategy process. This provides an effective bottom-up approach, centred on priority firms and the traded clusters within each region.

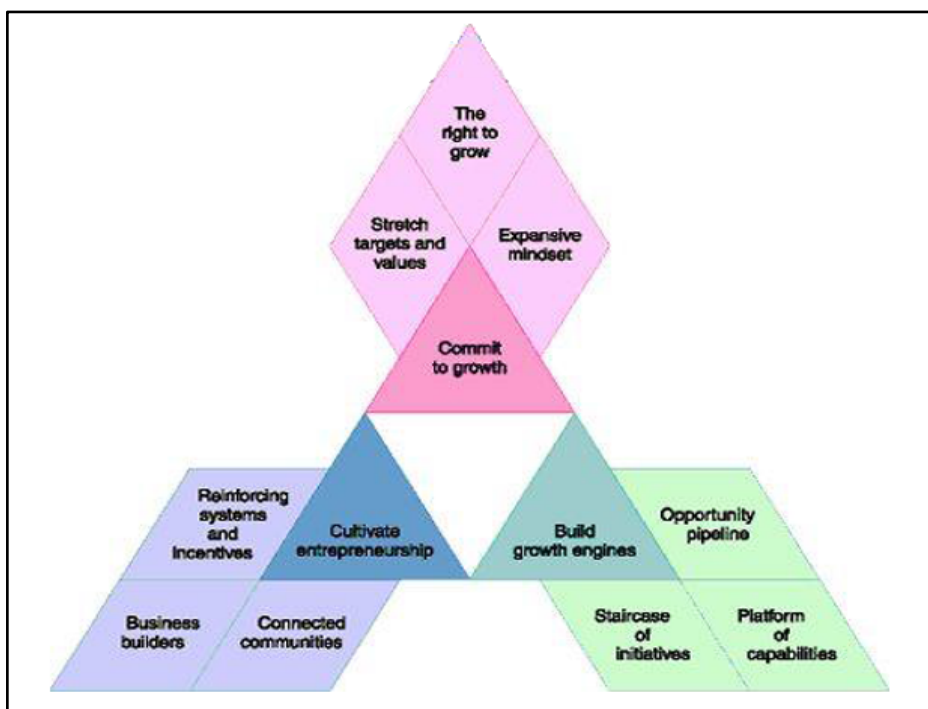


Figure 1 The Three Pillars of Growth

6. Submitters' Bios

Ifor Ffowcs-Williams, Nelson

CEO, Cluster Navigators Ltd. Ifor's cluster development experience covers over 50 countries. He has been an advisor to The World Bank, EU, OECD, UNDP, international aid agencies and national & regional economic development agencies on six continents. He is a Founder of the TCI Network, Barcelona, the global network for experts in clusters and innovation ecosystems.

Prior to establishing Cluster Navigators Ltd, Ifor was with NZTE's predecessor, encouraging businesses to cooperate-to-compete through networking and clustering.

E4@clusternavigators.com 0275704 990

Doug Galwey, Wellington

Doug has worked in both the public and private sectors. His areas of focus were business growth policy, firm capability, managerial economics, investment appraisal and performance management. He is interested in the practical application of theory. He has been the recipient of a Churchill Trust Fellowship, studying in the UK the use of benchmarking and self-assessment diagnostics as catalysts for organisational change. From his corporate days in one of NZ's largest companies, he understands the nuances of where the 'rubber hits the road' and can shine the light into the economist's 'black box' of the firm. MAgrSc (Hons) Canterbury; PhD, University of Hawaii

galwey@slingshot.co.nz 0274212145

David Wilson, Auckland

Managing Director, Cities and Regions Ltd. David has led and been involved with numerous research and consultancy projects related to economic development, governance, regional economic development, local government, business, cluster and industry sector development, inward investment, corporate citizenship, and sustainable development. Professional roles include Independent Advisory Panel for the Provincial Growth Fund; Director, and immediate past Chair, Economic Development New Zealand; Chair EDNZ and Royal Society of Arts Inclusive Growth Steering Committee; Learning Facilitator for EDNZ World of Learning professional development programme; Board member of social enterprise The "Be.Institute" and the Centre of Possibility at AUT; CEO, Northland Inc, Northland's Regional Economic Development Agency (2013 -2019); Director, Institute of Public Policy Auckland University of Technology (2010-2013).

BA in Psychology and Social Policy, Master's in Public Policy (1st class Hons), PhD in Governance and Regional Economic Development.

david.wilson@citiesandregionsnz.com 021763085

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Appendix

**New Zealand Competitiveness
Under the Shadow of COVID-19**

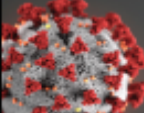
Christian Keels, Per Thulin
December 2020

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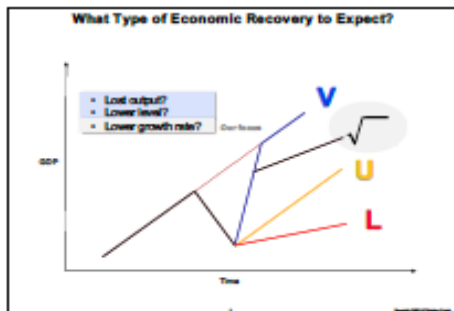
When will the vaccine end the pandemic? How quickly is the economy going to recover?

What policy actions are now needed? What is the impact of COVID-19 on competitiveness?

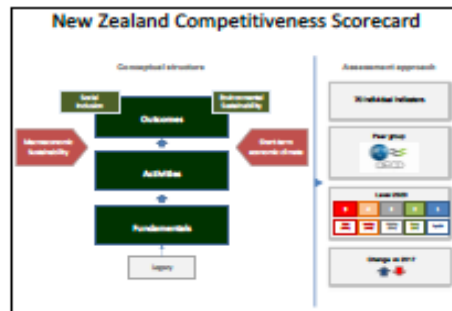
How can we build back better....?



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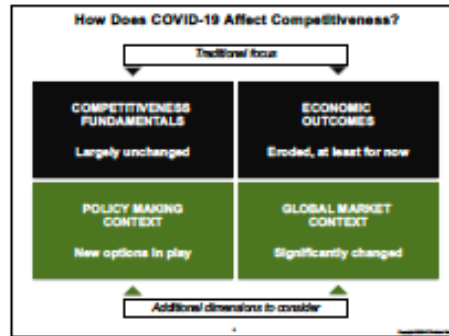
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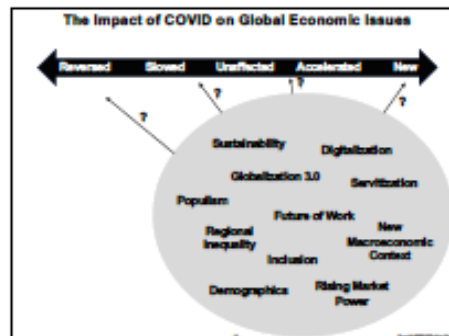
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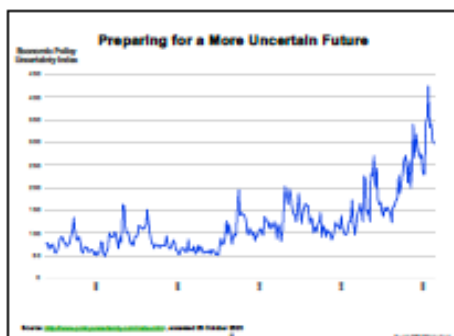
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