



COMMENTARY

The theory and empirics of the structural reshaping of globalization

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Abstract

Petricевич and Teece's (2019) article on the reshaping of globalization raises profound issues on the theory and empirics of international business. The fracture in the world economy between the USA and China is the result of Government policy, but its relationship to rising VUCA (volatility, uncertainty, complexity, and ambiguity) elements in globalization is more complex than simple policy changes. This paper suggests that a reappraisal of theory is required, not least because of the eruption of Covid-19, but that internalization theory is the best source of theoretical restructuring in the face of the new empirical realities facing the global economy.

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INTRODUCTION

The paper by Petricevic and Teece (2019) examines the reshaping of globalization, largely under pressure from the policies of key states, seeking to protect their own economies from the negative effects of globalization and to enhance their own competitiveness and power. They argue that this has led to increased volatility, uncertainty, complexity, and ambiguity (VUCA) and consequently multinational enterprises (MNEs) have to design new strategies to cope with this new environment. It is impossible to deal with such issues now except with reference to the uncompleted ravages of Covid-19. Together, these exogenous changes pose a severe test for extant theories of the MNE and globalization. This paper contributes by (a) critically examining Petricevic and Teece's paper, pointing to its strengths, weaknesses, and the additional questions that they raise; (b) showing how the reshaping of the global economy can be addressed using internalization theory; and (c) raising questions about the empirical significance of the bifurcation of the global economy.

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THE BIFURCATION OF THE WORLD ECONOMY

A successful theory has to remain robust to the most severe challenges. The current coronavirus crisis represents a huge exogenous change to the global system. Circumstances change, but theoretical principles have to withstand changes in factors external to the theory, and to remain relevant to understanding and predicting future states even in a radically changed theatre of operation. Two such recent changes are the fracture in the global system and the impact of Covid-19. Both of these elements are exogenous to the firm but both are “transmitted” by the operations of firms. The focus of the article by Petricevic and Teece (2019) is on “the fracture” but it is obviously necessary to take this in tandem with the exogenous shock of the virus.

The current coronavirus crisis calls into question the conventional attitude to risk and even to notions of a world of increased VUCA (volatility, uncertainty, complexity, and ambiguity). The existence of radical uncertainty suggests that the world is non-ergodic.

The global system will be subject to hysteresis, that is, the phenomenon in which the value of a system’s physical properties lag behind the effect causing them. Under hysteresis, the output of a system depends not only on its current input but also on its history of past inputs – the history of the system affects the value of its internal state. The effects of both Covid-19 and the fracture in the world economy make global systems subject to hysteresis. Covid-19 will have effects on the behavior of key agents (firms, managers, teams within firms) because of its disruptive effects and its induced behavioral changes. The fracture will also affect value-chain locational decisions, investment, and other strategic changes because it will induce a change in the mindset of managers by altering long-run perceptions of risk.

Petricevic and Teece’s paper allows an evaluation of the critical issue of how well current theories respond to non-ergodicity and hysteresis. This is an opportunity to stress-test theories. Theory must be able to cope with the new circumstances but must not be subverted by them. The way to test this is to produce the stylized facts that the theory needs to explain. This is based on the model in Buckley and Casson (1976, p. 31) listing “phenomena which require explanation”. The phenomena requiring explanation suggested by Petricevic and Teece arise from the contention that the international economic system is subject, at a macro level, to

“bifurcated governance”, whereby two incompatible systems struggle for hegemony. At the micro level, they suggest that “value chain decoupling” results where actors in each of the rival systems operate as insiders and only engage with the outside system where absolutely necessary and on strictly defined terms. Both of these constructs are special cases of more general theoretical concepts as we shall see. In practice, the Chinese system operates through state-to-state contracts through state-owned enterprises (SOEs). The “Western” system operates in the Chinese system by “offshore outsourcing” using contracts to keep the alien system at arm’s length. Thus, each system sanitizes itself against contagion from the other.

Petricevic and Teece utilize dynamic capabilities as their main firm-level concept. This is an organizational-level analysis of abilities (the power to do something) and capabilities (possession of the skill to do something), which encompass talent, skill, and proficiency. Its analytical traction comes from benefits from factor market imperfections internalized within the firm. There are problems with identifying “dynamic capabilities” as a theory of globalization. The implicit model in the Petricevic and Teece paper is that exogenous forces (in the prime case, government policies) impact firms that have varying levels of adaptability (some firms can respond, others cannot). This “ability to respond” becomes a generalized “capability”, differentiating firms and becoming, tautologically, a synonym for successful adaptation. Direct investigation of the (differential) ability of firms to respond to exogenous external events would give content to these assertions [as in Spender’s “industry recipes” (1989) or Penrose’s under-utilized managerial resources (1959)], but a more precise, theoretically justifiable schema is needed.

Causality in the Petricevic and Teece paper is difficult to fathom because of their use of the passive voice. “The global economic system is now being disrupted and is undergoing significant structural reshaping” (Petricevic & Teece, 2019, p. 1487). It does appear that the *primum mobile* is changes in government policy (towards “techno-nationalism”). The impact of exogenous policy changes is relatively easy to track in a well-defined model in which exogenous circumstances change but where the theoretical principles remain relevant. For instance, in the internalization theory-based model of the global factory, the principles of market versus firm, the optimal location for all activities, and the governance of the firm to achieve

innovation all react to policy changes in theoretically predictable and empirically tested ways (that tariffs reduce imports and induce tariff-jumping FDI is well established in 50 years of international business theory and even more years of international economics). In macro theory, from Ricardo (1817), to Vernon's (1966, 1974, 1979) product cycle hypothesis, such outcomes are predictable, stable, and well documented. Similarly, using meso-theory, such as the market for market transactions (Liesch, Welch, & Buckley, 2011), we can predict the effects of policy on outsourcing. Using the appropriate micro-theory of the firm based on internalization principles, we can show how modern, dispersed networks, orchestrated as in the "global factory" model, will shift the strategies of the firm. Possibly, in the long run, these policies will cause a shift in the nature of MNE itself, from a horizontally and vertically integrated organization to a more differentiated network (global factory) and its organizational strategy to regionalized, localized, or multi-domestic more loosely coupled organizational forms.

The Petricevic and Teece paper, however, commendably, seeks to go further than tracing the global impact of these profound policy shifts and the retaliatory nature of responses between two potential hegemonic powers in China and the USA. The authors suggest that the policy actions, and retaliation, leading to the global fracture of the previously integrated world economy, increase VUCA conditions. Thus, volatility, uncertainty, complexity, and ambiguity increase by "cascading processes" (both "upward" and "downward").

"These countries are practicing novel systematic and systemic mercantilist approaches, thereby triggering massive VUCA conditions for MNEs and large-scale cascading processes" (Petricevic and Teece, 2019, p. 1495, figure 1).

The proposed causality thus seems to be from policy-induced changes, fragmenting the global economy, to increased VUCA, but interesting innovations by the authors are the dynamics of the system and the cascading processes, implying differentials in the levels of impact of the original policy changes. It is not clear if all the increases in VUCA are policy-induced. Petricevic and Teece in Figure 1 (p. 1495) seem to imply this, but it is preferable to address other sources of VUCA, including exogenous events such as the Coronavirus, technological shocks, and "general IB environmental conditions" (as Figure 1 has it).

Are these processes theoretically tenable and empirically testable? Does the causal chain from policy to VUCA to impact strategy seem plausible? Can we identify cascading mechanisms as a new conceptual innovation? Do we need to create new levels of causation in the analysis of global political economy?

VUCA

The current Coronavirus crisis calls into question the conventional attitude to risk and even to notions of a world of increased VUCA (volatility, uncertainty, complexity, and ambiguity). The existence of radical uncertainty suggests that the world is non-ergodic. An ergodic process is one whose properties can be deduced from a single (sufficiently long) random sample of the process. Non-ergodic processes change erratically at an inconsistent speed. In an ergodic process, every sequence or sizeable sample is equally representative of the whole. Consequently, this provides the condition that, in an interval of sufficient duration, a system will return to states that are closely similar to previous ones. This can by no means be assumed in the current crisis.

The global system will be subject to hysteresis – that is, the phenomenon in which the value of the physical properties of an entity lag behind the effect causing them. Thus, the output of a system depends not only on its current input but also on its history of past inputs. Thus, the history of the system affects the value of its internal state. Hysteresis in the form of increased VUCA may spell the end of long GVCs and result in a more localized world. A potential countervailing force may come from technological advance however; for example, Blockchain can substitute for personal trust and information flows can to some extent substitute for physical trade flows. The role of logistics companies will be pivotal in the future. The export proportion of GVCs was already falling pre-virus as higher value-added elements of GVCs were being "reshored". This accelerating trend, as Petricevic and Teece suggest, will be a feature of the post-virus world.

There is a sense in which the Petricevic and Teece analysis is an attempt to bring certainty into a VUCA world. After all, if we can identify "the fracture" between China and the USA as the main source of instability, the world becomes more predictable and VUCA is, by definition, reduced. Indeed, it is by amassing knowledge that we can



confront the elements of a VUCA world. This is true also of the reaction of company strategy to VUCA. The causality runs from policy instability (rather like monetarist economics) that reshapes global governance, to VUCA, which then affects institutions at various levels (supra-national, national, and sub-national). Petricevich and Teece state that the structural reshaping of globalization “will require new tools and frameworks” (p. 1495). This is presumably with respect to the “cascading” mechanism in figure 1 that traces the sequencing of these effects (the timing of events is much more difficult to predict).

STRATEGIC AND NON-STRATEGIC INDUSTRIES

Petricevic and Teece are fond of dichotomies. Their industrial analysis divides strategic from non-strategic industries. This division is created by definition (and is somewhat confused) and is chosen in preference to placing industries on spectra such as more or less trade-intensive, more or less defense-related, more or less government procurement-intensive, the extent of subsidization. However, key features of the analysis are worthy of further investigation. They argue that a strategic industry provides social benefits beyond its direct value added. This is essentially the creation of positive externalities. These include spillovers from innovation and locational synergies. These Marshallian effects are best analyzed in an internalization framework. Firms create both positive and negative externalities that provide opportunities for further growth by internalization by other firms (Buckley & Casson, 1976, 2020). Locational externalities provide the rationale for different trajectories of growth in different countries and sub-country clusters. The creation of public goods by “technically progressive” innovations provide bases for growth for related industries. For completeness, we should add the development of “merit goods” (Musgrave, 1959), including education. Investigation of these attributes may give us better government policy prescriptions than those derived from “techno-nationalism”. The Petricevic and Teece analysis provides a new take on the case for subsidy in public policy but not the means for a complete analysis. The emphasis on appropriation is central to their analysis, and to the notion of dynamic capabilities, but a wider vision is necessary. Such an extension would require a careful investigation of competition in creating innovative goods and services, entry barriers, regulation, and investment

requirements. The externalities that “strategic industries” create are well worthy of deeper investigation and, in the age of the platform as an appropriation mechanism and anti-competitive device, the Petricevic and Teece piece is pioneering.

INTERNALIZATION THEORY AND VUCA IMPERATIVES

A good theory should give us comfort. It should subject unknown exogenous forces to discipline by the application of transparent, rigorous, widely accepted principles. Not all external influences are non-ergodic. The use of good theory and empirical testing makes the non-ergodic a residual. The key is to establish a sequence of causation that can encompass the non-ergodic shock and render it comprehensible. The unexplained in the current round of theorizing becomes the object of investigation in the next. Tracing the key elements of VUCA through an internalization or “global factory” analysis involves examining the impact of increases in each of the VUCA characteristics on internalization decisions, location decisions, and coordination decisions across networked multinationals (Buckley, 2018a, 2011, 2020). Much of the analysis revolves around information collection and its dissemination around the firm (Buckley, 2020; Van Tulder, Verbeke, & Jankowska, 2020). A major challenge is to bring random and unanticipated effects into deterministic models.

COLLECTING INFORMATION

VUCA analysts take uncertainty as a basic ‘fact of life’, but this is not universally correct. Uncertainty can be reduced by collecting information. Even if it cannot be entirely dispelled, its impact can be reduced by narrowing down the margin for error. It is therefore irrational always passively to accept uncertainty. Is it possible to know how much information is worth collecting? Rational action modeling provides an answer to this question. All that is required is that the decision-maker can estimate the cost of collecting relevant items of information, and attach subjective probabilities to what the results of investigation will turn out to be. This allows the decision-maker to estimate both the costs and the benefits of collecting information, and therefore to arrive at a rational information strategy (Casson, 2000). Decision-making thus becomes a two-stage process: in the first stage, the decision-maker decides how much information to

collect, and in the second stage he uses the information he has collected to make the decision. These two stages are interdependent, and the rational decision-maker arrives at his strategy by considering them in reverse order. He knows that it would be wasteful to collect information that would not influence his decision. He therefore needs to determine in advance how he would use a particular item of information. If he would not use it, whatever it turned out to be, then it is a waste of time collecting it. Only once he has decided how he would use it is he in a position to decide whether he wants to collect it (Casson, 1995). Research is not the only way of augmenting the information set. If decision-makers wait long enough, the information they require may reveal itself. By deferring a decision, he may save the cost of collecting the information from the outset. The reason why firms do not delay decisions is the cost involved. For example, if market entry will be profitable right away, profits will be lost if entry is deferred. Furthermore, there is a risk that another firm may enter the market and pre-empt the profit opportunity. Comparing deferment with research, therefore, there is a trade-off between saving information costs on the one hand, and losing revenue on the other. If market entry decisions were fully reversible, then there would be no need to defer a decision. A provisional decision can be made on the information that was freely available at the outset, and when additional information became available this decision can be changed as appropriate. The revenue stream would therefore commence immediately, and the cost of information is avoided altogether. The only losses would relate to errors made at the outset, and corrected later (Buckley & Casson, 2001).

In practice, of course, most decisions are not reversible. If the firm invests in a foreign production plant, for example, it will not be able to sell it off for as much as it cost to build. The 'illiquidity' of the plant means that the firm incurs a capital loss. Similarly, if the firm adapts the plant to some alternative use, then it will incur adjustment costs. Some investments are more readily reversed than others. Strategies that involve reversible investments afford more flexibility than those that do not. High levels of uncertainty favor the selection of flexible strategies, since mistakes are easier to put right (Buckley & Casson, 1998). Flexibility in strategy is therefore essential as VUCA conditions increase globally.

VOLATILITY

In situations of increased volatility, presenting an unexpected or unstable change in the external environment of uncertain duration but one that is not necessarily hard to comprehend in information content, we would expect firms to build in slack, to devote resources to preparedness, to stockpile inventory, and to overbuy talent. These strategies are costly, but investment should match the risk. This may mean increased internalization for greater control, but a corresponding increase in multiple sourcing of peripheral activities with core resources becoming increasingly centralized. This will be accompanied by the increased collection of information on the external environment, with greater transmission and coordination of informational resources from the center.

Real options provide a way of explaining and understanding many practical aspects of business behavior in the face of increases in volatility (Kogut & Kulatilaka, 1994). This explains the seeming irrationality of procrastination and delay in committing resources to new foreign markets, and the cautious incremental approach to investment often pursued once the entry into the market is effected (Buckley, Casson, & Gulamhussen, 2002). Options reduce risk by providing the flexibility to respond to new information when it becomes available. The key to a successful exploitation of real options is to foresee the kind of information that is likely to become available, and plan the options to exploit this information from an early stage. Flexibility can take many forms: international joint ventures (IJVs) provide flexibility through contractual options, whereas small reversible investments in versatile assets provide flexibility in a non-contractual form. A combination of these forms of flexibility is possible, for example, by holding a portfolio of IJVs, each of which operates versatile assets, and utilizes information by-products from other IJVs, as well as supplying its own information by-products to them (Buckley & Casson, 2001).

The use of models based on real options thinking enables us to understand the strategy of firms over time in response to increasing volatility, including volatility induced by government policy and its cascading effects.



UNCERTAINTY

Uncertainty means that the basic cause of an event is not known; change is possible but not a given. The rational response here is to invest in information – to collect, interpret, and share information throughout the organization. This will require structural changes including the improvement of information analysis networks to confront ongoing uncertainty. In internalization theory, this means an increase in core activities and a potential decrease in peripheral activities. Sifting and validation of information on environmental uncertainty will be a top-down, centralized process. There may be an increase in the number of locations utilized by the firm as insurance against contingencies. Increased flows of information are needed both from, and to, the orchestrating center of the firm and peripheral locations will need to be empowered in the information system of the firm, given that key locations of the basic cause may be unknown.

Liesch et al. (2011) reviewed the literature on risk and uncertainty in the internationalization and international entrepreneurship literatures and suggested that a more nuanced treatment of risk and uncertainty was required. They introduced dynamic concepts of uncertainty acclimatization and risk accommodation to analyze how these elements might evolve over time within internationalizing firms. Much of this restructuring relies on the collection and synthesis of information within the (multinational) firm. Buckley and Carter (2004) examined the organization of the process needed to combine different types of knowledge within the MNE. This is an imperfect process where knowledge losses, decision losses, and coordination losses lead to barriers to the effective combination of knowledge. Organizing the debate around knowledge as a ‘justified true belief’ (Nonaka & Takeuchi, 1995, p. 58) helps to differentiate reduction of risk from the situation of uncertainty where belief (and strength) are based on incomplete information.

The organization of knowledge flows is critical within the MNE and within global value chains or global factories (Buckley, 2011). Knowledge flows imply resource costs of running an internal market in knowledge and these include the increased communication costs and increased costs of managing complexity (communication costs) (Buckley & Casson, 1976, chapter 2). Buckley and Carter (1996) examine these costs as motivation costs, information costs, and coordination costs.

Thus, high external transaction costs do not provide a sufficient motive by themselves for market internalization. This will only be true if internal transaction costs are lower. Knowledge flows in reaction to risk and uncertainty therefore help us to have not only a theory of market failure but also one of organization success.

As in many aspects of IB research, the level of analysis is critical. In examining how MNEs respond to risk, including that generated by government policy, the organizational level account is built on the premise that “capability” is a prerequisite for risk-taking (Petricevic and Teece (2019), while the individual level account focuses on MNE managers’ intrinsic behavioral attitude (Buckley, Chen, Clegg, & Voss, 2016). Reconciling these elements to give a fuller account of risk taking in FDI has led to the concept of risk propensity, analyzing international decision-making as a behavioral process taking account of managers’ preferences and the context of the individual firm (age, experience, size, degree of diversification) (Buckley, Chen, Clegg, & Voss, 2018). This gives a more nuanced approach to the prediction of MNEs’ reaction to uncertainty.

COMPLEXITY

Complex situations have many interconnected parts and variables. A key problem here is information overload. Again, restructuring may be required and bringing in and developing specialists to address the complexity may result in profound organizational change. This may result in a decrease in internalization of activities, as outsourcing to specialist units may be required. This is likely to increase the spread of locations in the global factory system to tap into key specialists that are unlikely to be co-located with each other, or with the focal firm. An information strategy of collecting information in peripheral locations and coordinating this at an information hub will be the response to increases in complexity. The information core will exercise the key functions of sifting, selecting, and distributing the information to key decision-makers in the firm.

The rational action approach clearly implies that, in a complex situation, some decisions are more important than others are, and indicates why this is the case (Buckley & Casson, 2001). A strategic decision, in rational action terms, is a decision that has a number of key characteristics. These include a long-term perspective creating a need for inter-

temporal planning; an uncertain environment; information that needs to be collected in the most efficient and reliable manner; an irreversible commitment of resources; and interactions with other strategic players involving either competition, cooperation, or both. Because strategic decisions determine the context in which future tactical (short-term) decisions are made, the implications for tactical decisions need to be considered before strategic decisions are made (Buckley & Casson, 2001).

There is now a 'critical mass' of rational action techniques to analyze strategic issues. These techniques address strategic complexity through clarification and simplification of the decision problem [see for example (Kreps, 1990)].

AMBIGUITY

In ambiguous situations, causal relationships are unclear, precedents do not exist, and the firm faces "unknown unknowns". This requires an experimental response because the ultimate understanding of cause and effect will require the generation and testing of hypotheses. The firm will need to design experiments so that lessons can be learned that can be diffused around the firm. Some key functions will be internalized as the firm's "brain" ("encephalization" in Knight's term (1921), picked up by Hymer (1960)). Peripheral locations may well be reduced as centralization of functions occurs. A complex information and coordination strategy should be implemented with careful experimentation, testing and dissemination of results of the experimental approach throughout the organization. There is a case for the use of relational contracts and alliances in the face of ambiguous situations. The intention of arm's-length and alliance arrangements in the face of ambiguity is that the recruitment of external (or quasi-internal) organizations will allow a distinct and different view of the ambiguities, and can advise but not determine strategy.

The location and control (internalize or outsource) decisions of multinational enterprises are complex and are at the core of international managerial decision-making. They are ambiguous because causal relationships are unclear, and there are many 'unknown unknowns'. In examining FDI choices, Buckley, Devinney and Louviere (2007) presented managers with investment scenarios using choice – theoretical models that forced managers to make choices and thus reveal their

preference structures. These included levels of risk and managerial experience. The choice experiment thus artificially reduces ambiguity but enables the analyst to evaluate the weightings given to different elements in the complex and often ambiguous external environment. 'Unstable' environments are traded off against returns, cost of production, market size, and growth and other features of the environment. Again, a body of theory and analysis exists to formulate strategies in the presence of rising ambiguity.

Internalization in a VUCA World

This over brief review of an internalization theory analysis of increased VUCA shows the tractability of such an approach to difficult theoretical constructs. Moreover, there is no one clear outcome of increased VUCA on any of internalization decisions, location decisions, or coordination and information strategy. The configuration and control of individual activities needs careful analysis and factors such as the technological base of the firm, its nationality of ownership, and the optimal location of critical inputs to the firm's processes will all vary. We cannot say that, overall, the outcome will be greater centralization, internal control, or dispersion. As always, careful application of the principles requires attention to detail.

It is arguable that the decomposition of VUCA into its four constituent vectors does not fully capture its collective impact on the global economy. Interaction and reinforcing relationships between each element are certainly theoretical and empirical possibilities. Firm-level strategy, dictated by adherence to the above analytical techniques, therefore proceeds by recognizing the key aspects of the VUCA environment, having an internal intelligence system that allows the collection and internal dissemination of the duly sifted information, and empowering those decision-makers in the firm that are closest to the information source and respond to its impact. This corresponds to the principle of subsidiarity (Buckley, 2018b; UNCTAD, 2004). Coordination of these processes is the central, non-delegable role of headquarters, the essential element that justifies the need for cephalization within the firm.

It is necessary to keep these organizational responses in mind when considering the national- and firm-level imperative to innovate, not only in technical domains, but also in organizational design at the national level and the innovation strategy of MNEs.



Innovation

A major component of the Petricevic and Teece narrative is that techno-nationalist government policies have impacted upon innovation and the innovation process. Petricevic and Teece compare the “techno-nationalism plus” of the Chinese state-directed system with the entrepreneurial consumer-driven capitalist innovation system of the USA. The Chinese innovation systems is characterized by bending rules, inventing new rules, subverting conventions (including international conventions), and using means both legal and illegal to capture foreign technology through “Introducing, Digesting, Absorbing and Re-innovating” (the IDAR model). This technology misappropriation is conducted by a “military–civilian fusion” that includes the poaching of talent from abroad (individuals who are, rather darkly, alleged to prefer state loyalty (to China) over company loyalty).

The Chinese “ruler-based system” is contrasted with the “rules-based system” of the USA. The Petricevic and Teece analysis suggests something of a loss of faith in the efficacy of the competitive capitalist innovation system, conducted under the rules of intellectual property protection and the patent system, under which rewards are disproportionately allocated to first movers. The strength of the Western system is its powerful incentives to innovate; its weakness is that it is difficult for different institutions to build cumulatively on the innovations of other institutions. Difficulties in the organization of research and the renewed challenge of China suggest that a reappraisal of the effectiveness of the Western innovation system is overdue.

A fundamental reappraisal of innovation systems must begin with its basic structure because firms are only part of an ecosystem with multiple interactions. The innovation practices of individual institutions, including commercial firms, need to be set in the context of the total innovation system. Innovation requires increasingly large inputs of resources, particularly of highly skilled, trained labor. In addition, the research environment, including incentives and the working environment, are keys to success. The innovation process needs to be well directed and managed. The management process (and the creation of “dynamic capabilities”) is the focus of Petricevic and Teece’s article. This is a partial approach to the contrast of systems. Key inputs evolve from the education system – creative people. Investment into education is vital for innovation. Historically, Western

democracies have excelled at innovation because competitive individualism and free-thinking empowers the population to be inventive. Collectivist cultures have been less successful at invention. This is only part of the story because innovation requires cooperation. Free association and the organization of innovation in capitalist firms has been the institutional recipe of the West with invention sub-contracted to universities and specialized research institutions, including small firms. The role of the MNE has been to purchase innovations, by contract or by internalization (acquisition of specialized firms) and then to combine this with production and marketing to create an integrated institution, the natural market for whose product is global, so as to amortize the costs (including the costs of innovation) across the widest possible market. This is the rationale for the MNE in internalization theory (Buckley & Casson, 1976, 2020). Subsequently, the MNE has been able to fine-slice this process and through improved purchasing and data analytics to subcontract activities to specialized units around the world and to orchestrate, rather than own, the totality of the activities in a “global factory” structure (Buckley, 2009, 2018a).

An alternative, hypothetical, innovation system could be based on the public funding of invention and then the auctioning of the output to institutions (firms), specializing in the production and marketing of the innovations. The MNE can thus be seen as an alternative to the auction of inventions – an alternative to contracting knowledge on the open market (Casson, 1979). A consideration of the public auction system is worthwhile because it helps to identify the inefficiencies in the internalization within the firm innovation system, and to identify the boundary conditions as to where MNEs are non-optimal. In several areas of medical research, governments auction basic science breakthroughs to private firms. There are well-known problems in the market trading of knowledge, not only the difficulties in transferring tacit knowledge between institutions (Polanyi, 1958) but also the buyer uncertainty problem, where the buyer does not know the value of the invention until in possession of it, by which time the buyer has no need to pay for it (Buckley & Casson, 1976, pp. 38–40). This brings us to the analysis of contracts.

Essentially, Petricevic and Teece is a plea for fairness and transparency in contracting. The “rule of law” is a call for fair contracts. Unfortunately, the

analysis ignores extant contract theory, suggesting that “relational contracts” are prevalent in many transactions (Macneil, 1974, 1981a, b). They are the norm in Chinese business where “the letter of the law” in contractual dealings is less important than “the spirit of the law”. Relational contracts are intended to provide the structure for a cooperative relationship between the parties to the contract. In many situations, relational contracts are open to abuse (some “Belt and Road” arrangements may be cases in point) but they allow the parties to build cooperation beyond the contract and set the framework for ongoing dealings beyond the bare terms of the contract. This sets a relationship, not a one-off deal. This is the basis of the “law-in-action” school (Macaulay, 1963) showing the importance of going beyond the strict terms of the contract to the total relationship between the parties. In the Chinese context, contracts are a signal of an intent to cooperate, not a restrictive set of rules. In many circumstances, relational contracts will be more effective channels of cooperation than black letter contracts. Ideally, they are vehicles for building trust between the parties (Buckley and Casson, 1988).

The state-driven nature of the Chinese innovation system provides a contrast both to the one operative in the West and to the hypothetical auction system. In China, there is less diversity within the elements of the system where state-owned research institutions deal with SOEs that largely manufacture and market outputs. This is not a uniform, monolithic system. Managers of SOEs operate in their own self-interest and agency problems exist throughout the system. This results in widespread “corruption” as individuals and groups operate for self-interested goals (a major and valid criticism of the Chinese system is its “crony capitalism” characteristics; see inter alia Pei, 2016). Petricevic and Teece suggest that subversion of regulatory systems (international ones especially) is part of a coordinated Chinese strategy.

Competition between networks of innovation has been a feature of globalization. This is empirically the case in telecommunications. In 5G telephony, while China leads in hardware through Huawei, software is more advanced in Western systems. Cooperation across the systems is forbidden because of political security concerns. Similar international structural breaks occur in information technology, social media, and cultural industries, in contrast to non-strategic industries such as the manufacturing of consumer goods.

The disruption of the global economy resulting from techno-nationalism and the profound impact of Coronavirus present an opportunity to re-evaluate, and to re-invent, innovation systems. This paper has presented three models of macro innovation systems (the USA capitalist system based on MNEs, a hypothetical public auction schema, and the Chinese state-driven system). Coronavirus demonstrates starkly the need for an effective innovation system based on global cooperation, so the debate must continue.

Empirics: A Bifurcated World Order

The fracture in the world economy, as identified by Petricevic and Teece, is real, growing, and dangerous. In the wake of the Coronavirus crisis, antagonism between the world’s great economic powers is particularly dangerous, and the lack of cooperation on health and economic revival exacerbates and prolongs disruption. However, we should not forget that, formidable as they are, the USA and China together do not represent a majority of world GDP. Pre-crisis, the USA accounted for approximately 24% of pre-virus world GDP, China for 15%. The two leading economies face other centers of economic power in the EU, India, and Japan, with several important economies in each continent. Some can be regarded as independent, many are dependent on one (or sometimes, both) of the leading two. The rest of the world should not be relegated to a mere periphery, except in a highly qualified, stylized theoretical model. Following the coronavirus crisis, the performance of both the USA and China may be regarded as sub-optimal and other economies might be acclaimed as exemplars. These role models may include New Zealand, Canada, Australia, Singapore, and South Korea. Hard power might remain with China and the USA, but soft power may lie elsewhere. Groupings of small and middle-ranked powers may assume moral ascendancy and new coalitions could emerge to challenge the “big two”. It may be fanciful to suggest that such a coalition could seize the levers of power in a post-virus world, but they may be able to exercise increased independent influence on international institutions, particularly those in need of reform such as the WHO, WTO, and UN agencies. The fracture may not be complete, nor be the only global policy change of significance in the post-virus world. Cooperation on a global scale is necessary in response to a pandemic and some of this cooperation may ameliorate the negative effects of the policy-induced fracture.



The Covid-19 crisis will have important rebalancing effects between private companies and governments in Western capitalist countries, including the USA. The massive interventions in the private sector imply that governments will continue to have increased influence in the economy (another hysteresis implication). First, there will be conditionality on the grants and loans to private companies from the government to support activity and jobs. These may include non-payment of dividends, constraints on executive remuneration, and progress toward the “net zero” economy. Some Western governments may include specific sector and regional activity guarantees. Second, governments may wish to convert some grants to equity, thus increasing direct ownership over swathes of the economy. Third, the question of repayment will require either increased taxes or increased public expenditure, or both. This rebalancing may make the contrast (the fracture) between two systems correspondingly smaller. These effects may be stronger in the “rest of the West” rather than the USA, but can they be completely dismissed?

The fracture between US and China is the key point of the article, but is this a UNIQUE fracture (“rule of law versus rule of rulers”). Does it transcend previous bifurcations such as the “cold war” between “the West” and “communism”, after the creation of the “iron curtain”, post-World War II? The Soviet Union was thought of as a technological rival, particularly in nuclear weapons, power, and space technology. Both this challenge - and that of Japan - proved not to threaten the Western democracies in the long run. However, this is with the benefit of hindsight.

The reference to the rule of law by Petricevic and Teece must mean national law. In recent years, the USA has not been a supporter of international law, rules, conventions, or institutions. It has progressively undermined the WTO, has removed its funding from the World Health Organization (WHO), and has challenged many of the UN’s institutions and initiatives. Instead of building and leading a coalition of like-minded nations, the US has defalcated from many of its traditional international allegiances, such as NATO. Perhaps the aggressive substitution of sovereign national laws in place of international law is the defining feature of techno-nationalism. If so, competition rather than cooperation becomes dominant in the global economy and the most important structural

reshaping of globalization is derogation of international obligations by the world’s leading power.

Does the rise of China differ from that of several recent “emerging economies” including Japan, and the “four little dragons” (Hong Kong, South Korea, Singapore, Taiwan)? Historically, does it differ from the rise of Germany or the USA, both felt to be threatening in their day? Is this a question of scale? Perhaps the answer is that China is both a strategic and economic threat as encapsulated in Petricevic and Teece’s notion of “Techno-nationalism”?

In new technologies, as exemplified by information technology and telecommunications, national champions indulge in global competition across the digital divide (a digital iron curtain) as exemplified by the “Great Firewall of China”. Here, the fracture may be deep and widening, leading to incompatible communications systems. The rise of “competitive connectivity” further bifurcates the world. The rise of cyber-nationalism reinforces the argument that the fracture is deep and permanent. The USA has been caught out by the dependence of 5G telecommunications networks’ dependency on the state-linked company Huawei, and was wrong-footed by Chinese control of the supply of “rare earths”. However, to treat the whole of the trading relationship with China as a zero-sum game risks inefficiencies at home and retaliation from abroad. Moreover, the treatment of China as only an adversary is an incomplete encapsulation of reality.

China as the Other

The narrative of China as a threat to the USA and not a collaborator in the world economy, not a self-concerned, domestically focused, player is a partial picture. There is mounting evidence that post-virus Chinese policy will increasingly focus on domestic economic conditions. CPC domestic policy has long been built on the six “stabilities” or “guarantees” (Xinhua News Agency, 2020). The six stabilities have guided economic governance since late July 2018. They target employment, finance, foreign trade, foreign investment, domestic investment, and economic expectations. COVID-19 has brought unprecedented challenges to the economy and forced the Party to change their policy priorities. Top leaders updated their economic mantra at the Politburo meeting on Friday 17 April 2020. Besides reiterating the six stabilities as policy goals, the Politburo introduced the “six ensures”: ensure employment, ensure people’s basic livelihood, ensure companies’ survival, ensure food and energy security, ensure stability of the production

chain and supply chain', ensure the operation of grassroots governments and public institutions (i.e., enough fiscal resources to keep them running) (Ministry of Foreign Affairs, 2020; Teller Report, 2020). These are all firmly domestic goals designed to achieve stability. The aim is "to achieve a moderately prosperous society in all respects" (Ministry of Foreign Affairs, 2020).

The contrast between societies based on "rule of law" versus authoritarian societies by Petricevic and Teece is crude ["rules based versus ruler based?" (Petricevic and Teece, 2019)]. The extent of state direction in China through state-owned companies (SOEs), its external projection through the Belt and Road initiative (BRI), the concentration on building the domestic economy through "Made in China 2025", and its augmentation by (re-)importing skills in the "Thousand Talents Plan" make China's economy a formidable competitor. The "developmental state" model, based on a largely mercantilist conception of trade is a characterization of Chinese policy. China's current "modest prosperity" is built on decades of "opening-up" and "go-global" policies based on attracting inward FDI and the lower-value parts of global value chains together with outward FDI to access resources unavailable domestically. This is supplemented by an unprecedented outflow of students to foreign schools and universities. Access to foreign consumers has been vital, especially since Chinese domestic (family) consumption has been extremely low, and deliberately depressed by policy. China has much to lose if it were to be isolated from the global economy by its own or foreign governmental policies.

The Petricevic and Teece argument largely assumes zero-sum competition and a powerful role of national government policy in the global economy. Farrell and Newman (2020) draw attention to the limitations of government policy in producing a clean break fracture of the global economy. Using the term "chained globalization", they note that; "Instead of liberating governments and businesses, globalization has entangled them" (Farrell & Newman, 2020, p. 70). The vulnerability, competition, and control that comes with globalization cannot completely be eliminated by deliberate policy. Complete "decoupling" would cause losses because of interlinked networks of global supply chains, financial networks, and information sharing through the Internet. The control of risks in flows of money, goods, services, and information has become a key source of international power. The building of parallel networks by China, notably

Huawei's communications network, represents a massive challenge to US dominance of the global economy. The use of government fiat in "chained globalization" is fraught with dangers – attempting to interdict flows of rival networks can have severe unintended consequences for the perpetrators from damage to the domestic economy and provoking retaliation. Smashing links in international chains can have unintended consequences resulting in the loss of economic welfare for the perpetrator as well as the intended target. Policies designed to fracture the world economy have costs – for the target country, for the instigator country, and for the global economy. Buckley (2018b) focused on two key issues in designing optimal policies for the global economy – the power arising from monopoly and market imperfections and the impact of externalities.

CONCLUSION

This paper has used internalization theory to confront the theoretical and empirical challenges arising from techno-nationalism and associated increases in VUCA, as outlined by Petricevic and Teece (2019). Internalization theory does not rely on esoteric knowledge, gnostic interpretation, nor in-group jargon. It can be applied by anyone with a grasp of its few fundamental principles. The global economy faces a massive challenge from Covid-19 and its aftermath. This could not have been anticipated by Petricevic and Teece, but it does fall within the ambit of their theorizing, as it further accelerates VUCA elements in the world economy and society.

What is New – Theory?

This paper shows that internalization theory can cope with the new circumstances of increased VUCA identified by Petricevic and Teece. The theory does not give easy or pat answers to the outcome in terms of firms' strategy and structure but a careful application of its key principles in response to such changes will give predictions that are clear and unequivocal. This provides a rich research agenda in testing and refinement of the theory. Petricevic and Teece (2019) have opened up a series of questions that international business theorists can answer – with care and caution.

New circumstances, such as the nature and significance of non-ergodic change and hysteresis, are important challenges for theory and for the prediction of outcomes. All theories can and will be stress-tested by these new circumstances.



What is New Empirically?

The reassertion of national sovereignty defined as the “exercise of power for public good”, is unquestionably increasing, its sustainability and the issue of in whose interest the supposed “public good” is exercised, notwithstanding. The need for security and belonging and collective well-being in the face of impersonal forces has driven political change and “control” of technology becomes a substitute for resistance to these forces. “Techno-nationalism” gives a spurious feeling of control to governments with few real independent policy levers. The outcomes include new MNE strategies: – the fracturing of GVCs and multi-domestic structures, rationalizing GVCs, increasing insurance costs, and inventory costs.

The new element is the coming of Covid-19. The coronavirus is likely to have the strongest impact on trends that were already happening (Buckley, 2018b). The virus broke out after the Petricevich

and Teece (2019) article, but all analyses and empirical observations are affected by this dreadful event. Its origin in China may have political repercussions that increase the fracture in the global economy. We can expect both increased antagonism and new forms of cooperation across national boundaries as national governments identify their new self-interests. We will also observe hysteresis as “lockdown” effects, debt, and bankruptcies linger. The analysis of the consequences of the virus on the global economy requires excellent theory and the meticulous application of theory to these new empirical realities.

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