SUPPLY CHAIN RESILIENCY IN A TIME OF GLOBAL UNCERTAINTY (WORKSHOP)

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Practical steps toward economic transformation for greater resiliency

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Good afternoon. Major General Walk, interested parties. I would like to thank you for inviting me to speak at this seminar on Resilience and Supply Chains. This is an increasingly important topic and we don't have time to waste.

I would like to make clear at the outset that I am here wearing two hats. The first is as a researcher at the Strategic and Defence Studies Centre of the Australian National University. The second is as the Head of Strategy for Shoal Group, a defence systems engineering company.

These comments are my own and do not necessarily represent those of either organisation.

This presentation will follow the general approach as outlined here. I will quickly provide some important context and then the why, the what, and the how of resilience – with an ultimate focus on supply chains and particularly on the levers that government might be able to use to develop resilience in these supply chains.

Resilience, derived from the Latin verb "resilire," meaning "to recoil," refers to the ability of a system to recover from misfortune or change. If we think of resilience in the national context, we must think of the ability for the nation to withstand, respond to, and recover from shocks; be they economic, cyber, natural disasters, social cohesion, physical attacks, or threats to the democratic process.

So, at the outset, we don't want this. We don't want to recover. We want to either avoid the shock completely, or to minimise its impact. We should therefore we discussing a derivation of the Latin word "evitare" – "to avoid", but let's just stick with resilience.

We can see from the start that resilience is associated with risk. The risk of a shock occurring, and the costs associated with the recovery, or preventing or minimising the shock so that recovery can, as far as possible, be avoided.

The 2024 National Defence Strategy describes resilience in terms of national resilience, industry resilience and supply chain resilience.

This description is a distraction as it implies that these are separate issues and can therefore be addressed separately. This is not the case.

From our earlier description, **national resilience** is the ability of a country to withstand or recover from a shock, industry resilience can be similarly considered for an industry, and supply chain resilience applies to a supply chain. This consideration immediately brings us to the realisation that the concept of supply chain

resilience differs from supply chain to supply chain within an industry, and all these industries (and their supply chains) ultimately roll up into national resilience.

Resilience might therefore be deemed to be critical in one supply chain, but less so in another. Supply chain resilience is, therefore, not an absolute concept. Different considerations will be appropriate for different supply chains. This is hardly an unexpected outcome, as risks will differ and investment requirements for mitigation will differ. But it is important in setting the context.

The National Defence Strategy also highlights the importance of innovation, science and technology, and the workforce and skills base in the overall consideration of resilience. These are critical factors, but not the only ones. We will return to these points near the conclusion to this talk.

What this all means is that a supply chain does not exist in splendid isolation. We cannot simply address the resilience of a supply chain – no matter how important we might consider it to be – without addressing the external factors that impact upon that chain, not just the internal factors. I will return to this point later.

Furthermore, it becomes obvious that national resilience is a multi-dimensional problem – a system of systems covering, not just defence, but an ongoing government, a functioning health system, the provision of food and water, and the energy, communications and transportation to make it all work. We could add other factors such as finance, education, and space. It is a complex problem.

What also becomes apparent is that defence is a consumer of these other elements within a functioning, resilient society. Defence consumes, and in return, defence provides security as a common good.

Moreover, given that defence cannot do its thing without industry, cannot deploy and operate as, when, where and for the period required without industry, improved resilience in industry and supply chains translate directly into improved resilience for defence force operations.

The why. I am somewhat preaching to the converted here, but it is important context.

Australia currently faces a deteriorating geopolitical situation, an ever-more emboldened and belligerent likely adversary, an increasingly unpredictable (and perhaps unreliable) ally, and a depleted manufacturing base.

The recent deployment of a Chinese naval Task Group around southern Australia has demonstrated how precarious our current situation is. The Trump Administration's position with respect to allies and long-standing (one could argue mutually supporting) relationships amplifies these concerns.

Supply chain resilience is therefore a critical factor for national resilience, to advance the military strategy of deterrence, for economic prosperity, and for social cohesion.

With respect to deterrence, the British strategist Colin Gray has previously stated that deterrence is essentially a state of mind that has developed in the potential aggressor and 'what matters most is not our capability, but rather what the enemy believes our capability to be'.

Therefore, not only do we need the appropriate military systems and hardware, and to be seen to be able to efficiently and effectively operate that hardware, but we also need to be seen by external observers to have resilience in the critical systems that underpin that operation.

But, investment funds are finite. We can't be self-sufficient. The best that we can aim for is some form of self-reliance, and co-operation with trusted partners. We therefore need to prioritise, but prioritisation is hard. If it weren't, it would have been done already.

What does this mean?

In considering the what (could also say where investment needs to be made), we need to recognise constraints within which we need to work.

Some of these are perpetual constraints – our geographical position for example means that movements within supply chains that involve importing or exporting are across oceans – and long distances. We are remote from the major industrial centres, which impacts on some types of collaboration.

We are a country with a small, population – concentrated into the southern parts of the country. We are a small domestic market. This means that in most cases a purely economic argument for an industrial activity is difficult to sustain. On this last point, given the deteriorating geostrategic situation the economic argument should be less important for the government than the strategic ones – after all, a focus jobs and growth because a moot point when the country is under direct threat.

We also have some constraints that can be overcome – but they need time and money – rebuilding the manufacturing base, diversifying the economy as examples. And because funds are finite we are back at the need for prioritisation.

But we also have some enablers. We are politically stable, we have an educated society, we are a high tech community, we are trusted in our international relationships. We have an abundance of resources – including many critical minerals.

Prioritisation therefore needs to take account of both the constraints and the enablers

So, to prioritisation.

We need to prioritise to address vulnerabilities (not just defence vulnerabilities), to mitigate risks, and to advance national interests.

Prioritisation therefore needs to be tightly aligned with national strategy.

Prioritisation in the defence environment needs to address the twin issues of mass and time – or rather the lack of both. An article written by Jonathon Caverley with respect to the war in Ukraine spoke about three types of industrial activity for defence – platforms, commodities (such as attritable drones), and military tech. For defence, we need to focus on the second and third of these.

To search for resilience in the supply chains of exquisitely beautiful (and expensive) platforms is wasted effort if time is short and conflict is possible with little or no warning.

Maintenance, yes. Battle-damage repair, yes. But concentrating on small numbers of large platforms does not provide mass, or deterrence, and the effort is entirely wasted unless the platform becomes available in a usable time frame.

As noted previously, we could, theoretically, prioritise to maximise economic activity but the current situation with a deteriorating geostrategic environment means that strategic aims need to trump economic ones. We therefore need to move beyond simply relying on the market to deliver.

Which means that government needs to do some heavy lifting.

And now the other difficult bit – How?

Before we get into consideration of the levers available to government, it is useful to consider types of resilience, as the available levers and the application of those levers will change depending on the type.

The first type is a state of resilience. Here, both the intellectual property and the manufacturing of the product are controlled in Australia. This means that we are free to further develop a product, to augment or otherwise change manufacturing processes, and to distribute according to national requirements.

Borrowing descriptions developed for my PhD thesis on defence industry sovereignty, we can consider this as Domestic Operation – Domestic Control.

The second type is limited resilience. In this circumstance we can manufacture, typically under license with pre-determined processes, the intellectual property may be held in country to support the manufacturing, but we don't control the IP. We cannot change it without the approval of the IP owner who will be offshore. This is Domestic Operation– Foreign Control.

The third type is partial resilience. The intellectual property has been developed in Australia, but manufacturing occurs offshore with the product shipped back into Australia. This is Foreign Operation – Domestic Control.

The final type is no resilience, with both the IP and manufacturing controlled and undertaken by an offshore entity. Foreign Operation – Foreign Control.

The other point to note is that resilience is not simply a binary consideration. In many cases there will be levels of degradation that can be managed – petrol rationing or pre-determined fuel distribution ratios as examples.

We also need to understand how degradation in one industry sector impacts on another sector and its associated supply chains.

Understanding these linkages is extremely important when the levers to be applied involve prioritising activities in one sector over another, or to avoid unintended consequences.

One way to gain insight into the linkages and dependencies is through the creation of a digital model.

Such a model would support system of systems analysis by focusing on dependencies and resources that are exchanged across sectors.

Through this we can conduct 'what-if' simulations to stress test the overall system, to investigate criticalities, and to look for unintended consequences.

The way in which defence-related activity, as a consumer, is impacted by other parts of the economy would become apparent.

It is evident that a model will quickly become very complex, so it would need to remain at a relatively high level. Consistency with other, more focused analysis undertaken within a sector or within a supply chain could, however, be maintained.

A digital model would combine infrastructure, assets, services and personnel and links between elements would provide a view of dependencies.

Links would represent resource and information dependencies and would have associated attributes to define the nature and capacity of the links.

Which brings us back to the various levers available to government, and how those levers might apply to different levels of resilience.

Working from the bottom up, partial and no resilience.

In this circumstance the government has precious little leverage. Manufacturing is undertaken offshore, and satisfaction of domestic requirements depends on the nature of the external relationship, and the security of the long-distance link.

For partial resilience, where IP developed and controlled within Australia is licensed to an offshore manufacturer, ongoing investment in the development of the domestic IP does not result in increased resilience – although arguably it will result in an improved product.

Partial resilience might be an option when the cost of establishing domestic manufacturing is prohibitive, but as noted previously, it does depend upon the trust associated with an offshore partner and associated transportation.

Limited resilience is associated with the domestic manufacture of a product when the IP is controlled from another country.

In this case there are levers available to government to expedite manufacturing, noting that IP control remains in other hands. Its therefore up to others to improve or adapt that IP.

The government can provide grants and concessional loans. It can provide mechanisms for the development of the workforce. It can provide access to government infrastructure, or it can provide green-field manufacturing infrastructure solutions.

It can provide taxation concessions in support of establishing or sustaining a manufacturing activity.

But the resulting level of resilience is limited.

Before we consider levers for a resilient industry or supply chain, it is necessary to quickly consider factors of production.

This is important as successful policy implementation requires the alignment of the levers and these factors of production.

It all starts with the government's ability to clearly define what it wants. No surprises there, but this is often the root cause of issues. Government needs to define what success in the resilience space (for the nation, for various industry sectors, and for various supply chains) looks like.

Looping back to an earlier part of this presentation, it comes down to prioritisation.

What products, when, in what quantity, and where to be distributed.

Both the government and industry then have something to work towards – together.

Infrastructure, machinery, test equipment, etc can be properly located. The workforce appropriate to the activity can be trained, developed, located. Intellectual property can be developed, together with the important know how and the know why. Innovation programs can be designed and pursued.

But without the clear determination of the end state, it becomes a little vague. Investment and energy are dissipated. Goals become misaligned.

And you might be thinking that this discussion doesn't reflect the real world, so a time and space reality check.

The time is now, so we don't have the luxury of introducing a green-fields approach to resilience. We have legacy systems and activities upon which we will build. Some of those will be based on domestic IP, some will not.

We will need products that are already in use in Australia, many from foreign suppliers and those that we need to develop ourselves. We therefore need to match innovation activities to priority requirements.

And existing product lines are obviously geographically established.

So the way forward must be a mix of the new (where the options may be more extensive) and the established (where they may not).

And the new must also simultaneously comprise the very near term, and what might be achievable in a longer time frame.

Which brings us to the available levers for resilience in supply chains.

It is not possible to definitely state which ones might be the most appropriate as that will depend on the government's requirements, on the investment required and the funding available. On priorities.

Some of these levers might be scalable, but we have seen through other innovation (let's just call them initiatives) that penny packets of investment don't equate to much.

So there would seem to be a level, I don't know off hand what that is, below which we are just wasting our time. This level will change according to the supply chain and the government's requirements.

Therefore, this slide is really a summary of what might be possible – not an exhaustive list as more innovative people than me can probably think of some other options.

But here we go.

Provision of **grants and concessional loans** to entities involved in the resilient supply chains. A pretty obvious response option to entice the establishment, or the development, of supply chains in Australia. The structure and management of the grant or concessional loan scheme will be important for timeliness.

The government provides **taxation incentives** for companies to establish or expand operations for the priority supply chains.

Financial support for research and development. This will be critically important as a means for the government to reach its supply chain priorities. Two things to say about this lever.

First, the government needs to be true to its own priorities, and not be distracted by seemingly, more politically attractive items. A somewhat utopian concept I know.

And second, if government does not provide this support (at an appropriate scale as previously noted), it is highly likely that innovation of sufficient scope will not develop as the domestic market may not be large enough for a commercial entity – a domestically operating, domestically controlled entity, to make the necessary investment.

Government **establishment and ownership of GO-GO or GO-CO entities**. The government forms a corporate entity and either operates it itself or has a corporate entity run it on its behalf. This raises an interesting point as to where such entities might be established. Studies have shown that industry clusters are more productive, more profitable and more innovative than geographically separated activities.

The Australian experience is typically the antithesis of this as state competition has always played a large part. The “every child wins a prize” approach to planning and developing resilient supply chains must be avoided. Therefore, location choices need to be impacted by existing academic and contiguous industry activities where cross-sector benefits can be readily achieved.

State investment in operating entities. The government makes its investment by buying into an existing domestic company – think CEA Technologies as an example. These investments need to be exclusively based on the priorities.

Provision of **government infrastructure and test facilities**. This could be as government building such facilities, but more likely making existing infrastructure and facilities available for specific supply chain activities.

Contracting. This part is really important. If we want to achieve the development of domestic, resilient supply chains, we can’t be hamstrung by the Commonwealth Procurement Rules. These work against what we want to achieve. An example is the recent introduction of a definition of an Australian company – being a business, including any parent business, that has 50% or more Australian ownership, or is principally traded on an Australian equities market; and is an Australian resident for tax purposes; and is a business that has its principal place of business in Australia.

This is essentially a domestically operating, domestically controlled entity as per our previous discussion.

While this definition is long overdue, it is just a data collection exercise to look at the participation of Australian businesses in Commonwealth procurement. The rules themselves still explicitly state that companies cannot be discriminated against on the “degree of foreign affiliation or ownership”.

So, how can we build the supply chains required for resilience under this limitation. The priority supply chains must not only have exceptions from this restriction but be given specific preferential treatment.

I suggest something along the following lines. For the highest priority requirements, then only domestically operating, domestically controlled companies (Australian companies as per the definition) can participate. For lesser priority, then preference given to Australian companies, but not exclusively.

For even lower priorities then back to the existing procurement rules.

Intellectual property. We need to ensure that intellectual property developed in Australia in associated with priority supply chains stays here. Sweden, for example, has a law where the state has access to military-related innovations made in Sweden, and the associated IP. In particular, any such invention must not be disclosed before it has been tested to determine whether it should remain classified, and government may order it to be used on behalf of the state, or that it be relinquished to the state, (with due compensation to the inventor), if it is of essential importance to defence.

We need to consider how intellectual property is treated for strategic purposes, not just economic ones.

One obvious lever is government support for **workforce development**. Again, it comes back to requirements, to the expected capabilities and capacities, and to promote development associated with clusters.

And the government changes or puts in place the **legislative and regulatory requirements** to support national resilience and priority supply chains. Do we have the ability to utilise the transportation assets of domestic companies, of state governments, or of private citizens, for example, in situations short of a declaration of war?

The final point I would make in this run through levers, is in the **utilisation of private capital**. There are cashed-up investors in Australia willing to invest into national security (and hence into resilience), but they need clear indications from government in order for them to properly assess the risks.

Finally, how to proceed.

Some of the levers outlined above will take time to come to fruition, so it is imperative that we start now.

We need to stop talking about a "defence industry" and talk about an industry for defence. If we are to achieve self-reliance in whatever it is that we want then it will be an all-of-industry activity. And we need to stop talking about industry as a FIC. This constrains our thinking about how industry contributes to the defence effort. We need to address industry as a capability.

One thing that will require early attention is to get the regulatory changes necessary to support things such as the requisition of civilian transport for resilience purposes. We need to ensure that government has flexibility to move as required, and does not have to declare war before the legal frameworks kick in.

As stated at the outset of this presentation, supply chain resilience cannot be separated from industry resilience, and hence from national resilience. We need to have a clear understanding of how society works as a system of systems. This is important so that investment benefits can be maximised, and so that unintended consequences can be avoided. A digital model might help.

Understand the risks at the national, industry and supply chain level – and then prioritise.

Determine manageable levels of degradation for prioritisation targets – and the flow on impacts of degradation.

Identify supply chains that can be clustered – either from scratch or integrated into existing infrastructure. Be ruthless about the need to cluster and avoid state-on-state competition. Develop workforce capability and capacity development plans for the clusters and implement.

Engage with the private investment community to determine the how and where private investment might be used, and what might be required in order to bring those funds to the table.

Ensure necessary international agreements are in place to ensure (as far as possible, noting that this is not guaranteed) continuity of supply when international partnering is required.

And finally, frequently at first, and then periodically, conduct ongoing review of implementation efforts for impediments to success or for ongoing improvement.