Analyzing The Relationship Between Resilience And Competitiveness Of The U.S. Aerospace Industry In The Global Supply Chain

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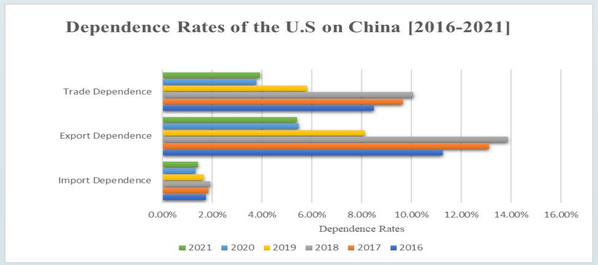
Abstract

According to the International Trade Administration, the U.S. civil and military aerospace sectors comprise the largest trading volume among all U.S. manufacturing industries, recording $191.3 billion in 2019. However, the total U.S. aerospace trade dropped by 36% during the pandemic, indicating the risks and vulnerability the industry had experienced. This poster investigates the pandemic impacts on the U.S. aerospace trade and assesses the resilience and competitiveness of the aerospace sector across its various products. Using the U.S. merchandise trade data from the 2016-2021 period, we empirically estimate the relationship between the resilience and competitiveness of the U.S. aerospace trade in its global supply chain network. We expect to find a positive relationship between the competitiveness and resilience of the U.S. aerospace sector and this finding will assist policymakers, manufacturers, and suppliers in developing strategies to respond to future catastrophes.

Introduction

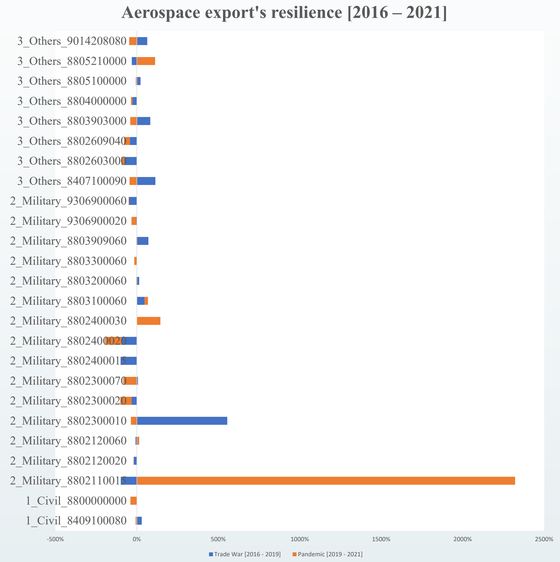
- The U.S. aerospace industry is the largest in the world and offers a skilled and educated workforce, extensive distribution systems, diverse offerings, and strong support at the local and national level for policy and promotion.
- The comparison between the resilience and the competitiveness of the U.S aerospace trade will showcase the impacts from the U.S.- China trade war in 2018 and the global pandemic in 2020 across its various products.

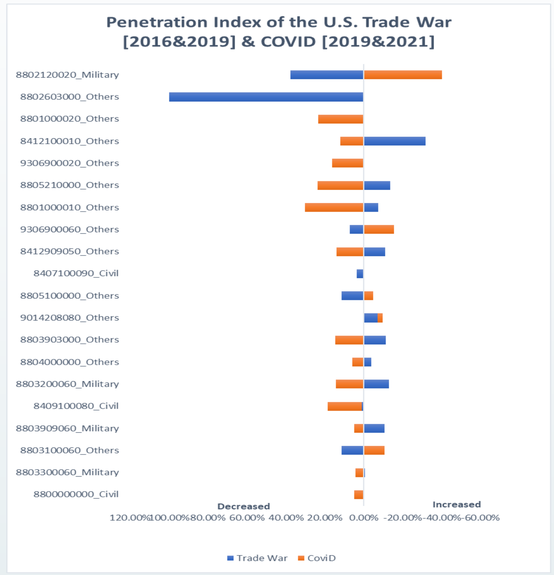


Limitations

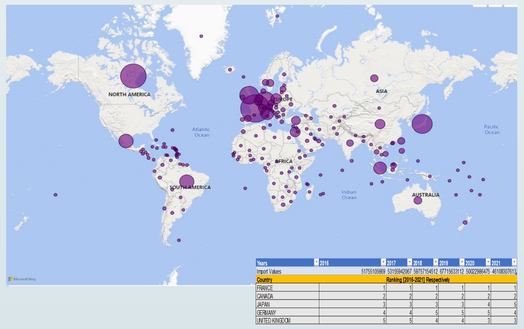
- The diversity between imports and exports groups makes it harder to categorize them into same groups.
- There are many other factors that affect the competitiveness and resilience of the aerospace industry.
- Our analysis uses export value in representing Resilience, Competitiveness through Penetration Index to test the relationship of the U.S aerospace industry's competitiveness and resilience

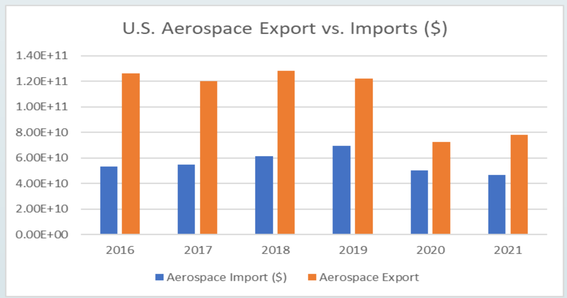
Overview of U.S. Aerospace Export Resilience and Competitiveness

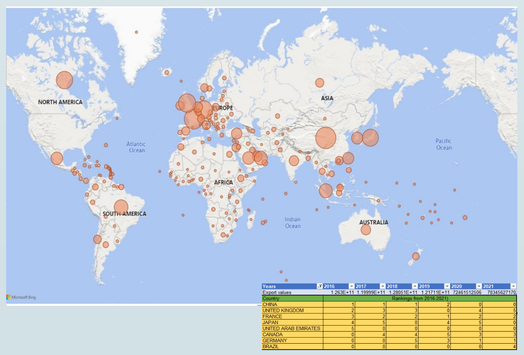


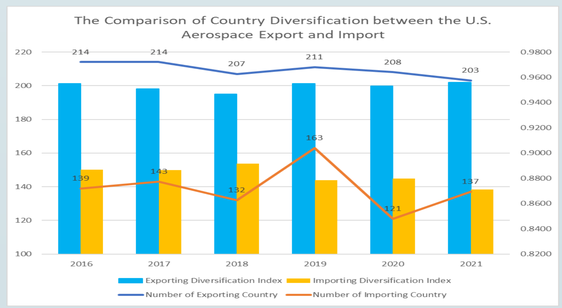


The Global Network of the U.S. Aerospace Industry









Variable Development

Revealed Competitiveness Index of Product i in Year t

$$= \frac{Number\ of\ Countries\ Importing\ Product\ i\ from\ the\ U.S.in\ Year\ t}{Number\ of\ Countries\ Importing\ Product\ i\ Worldwide\ in\ Year\ t}$$

Resilience Index of Product i in Year t

$$= \frac{\Delta Export\ Value\ of\ Product\ i\ before\ and\ after\ the\ pandemic}{Export\ Value\ of\ Product\ i\ before\ the\ pandemic}$$

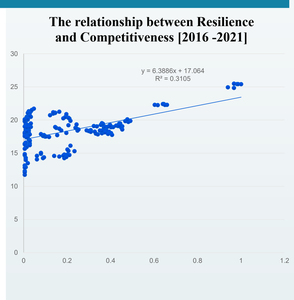
Results and Conclusion

The GLS Estimation Results

	ln_Resilience
Competitiveness Index	7.268***
	(1.206)
Year	
2017	-0.127
	(0.218)
2018	-0.132
	(0.223)
2019	-0.241
	(0.235)
2020	-0.342*
	(0.208)
2021	-0.191
	(0.206)
Aircraft, spacecraft & parts (88)	0.863
	(0.818)
INST & APPLN, AERONAUTICAL/SPACE NAVIGATION (90)	0.898
	(0.707)
Guided missiles & parts (93)	3.695***
	(0.829)
Intercept	15.927***
	(0.800)
R^2	0.4188
Number of observations	180

*** p<.01, ** p<.05, * p<.1

Robust standard errors in parenthesis



- There is a notably positive relationship between resilience and competitiveness within the U.S. manufacturing aerospace industry.
- The high concentration of the imports increased the risks on the export side.
- High trade surplus over the period signifies the high level of competitiveness in the sector. It indicates that the U. S's proficiency in producing innovative and highly advanced products; military products have a significant influence on industry resilience.
- The severe impact wrought by COVID-19, compounded by the ongoing tariff tension between the U.S. and China reveals the vulnerabilities of the industry. Prioritizing the development of comprehensive and adaptable strategies to minimize the impact of such crises is imperative.

Implications

Government Support and Policy Framework	Corporate Strategy
Trade Policy Frameworks Risk Mitigation Investment In Research	More Diversified Supply Chain Balanced growth between civil and military sectors Integration between suppliers and buyers at the country level Regional Cooperation