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## Just-in-Time versus Just-in-Case: Inventory systems and their potential impact on Caribbean Companies

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### ABSTRACT

The transition from Just-In-Time to Just-In-Case inventory systems has been discussed for over twenty years. The implications for such a change are possibly more problematic for Caribbean companies and economies than for others. The paper examines the root of the problem, the implications if such a change were to occur, and the possible strategies that could be used to adapt to a new supply chain system. Data from primary industry and fresh produce companies is used to evaluate the extent to which the change has already occurred.

Based on US Company data, the results indicate that to this point there has been no shift from Just-in-Time to Just-in-Case. However, planning for such an eventuality would probably be good practice.

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## 1. Introduction

Over twenty years ago, researchers started calling for a migration from Just-in-Time (JIT) inventory practices to Just-in-Case (JIC) practices to prepare for inevitable terrorist attacks on supply chains (Martha and Subbakrishna 2002). In the intervening years, there have been several factors regional and political adding concerns about efficiency, such as the Covid-19 pandemic.

Further, many of the Caribbean economies are classified as Small Island Developing States (SIDS) and are very sensitive to changes in business conditions. If a transition from JIT to JIC takes place, there will be a considerable burden placed on SIDS governments and SIDS-based companies, as they try to build the resources needed for local inventory management systems (Guerrero et al 2010).

With this regular drumbeat of concern (e.g., Harrington 2007, Brakman et al 2020), it would be well to review the extent to which company behavior has changed with respect to stock/inventory management. The results would be especially pertinent to Caribbean-based organizations because of their resource limitations. Companies operating in this region have fewer resources to invest in upgrading storage and distribution assets to meet supplier and buyer needs.

The following analysis examines the case of US-based companies to identify if those companies have changed their behavior with respect to

inventory management. If they have, there is much more likely to be a need for Caribbean companies to change as well. The paper is set out in five sections with a Literature Review, Data Analysis, Results, Discussion and Recommendations followed by a Conclusion.

## 2. Literature Review

Just-in-Time (JIT) systems are quite common in today's world, with companies making significant investments to achieve greater efficiency in the area of inventory management and logistics (Loedding et al 2014). In essence, what these systems do, when fully implemented, is reduce inventory to a bare minimum and have the day's resources required for production arrive on the day needed.

Not all industries or companies can effectively adopt JIT. Clearly, for many product/service combination industries (think selling and installing equipment) JIT systems have limited scope. In fact, not all production-only companies can effectively implement such a system (think cement production) because customer order quantities may change as weather systems or other environmental variables change. Despite these caveats, many industries widely accept that JIT is a touchstone for efficiency, and a laudable goal for the 'back end' process used for production (Blackhurst and Balthrop[a] 2023).

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That said, there have been calls (mostly from academics rather than professionals) claiming Just-In-Case (JIC) systems are now necessary because of the changing political and health environments (Blackhurst and Balthrop [b] 2023). These claims are based on the difficulties some industries have had because of supply shortages brought on by trade wars or health pandemics (Khorna et al 2022). In effect, these calls are striving for more resilient supply chains that are less dependent on fragile or external sources.

**Table 1 – Some of the items for the aquaponics system and the unit cost**

	Just in Time	Just in Case
Efficiency	X	-
Effectiveness (Normal)	X	X
Effectiveness (Crisis)	-	X
Responsiveness (Long Term)	X	-
Responsiveness (Short Term)	-	X

As depicted in the above Table, in a crisis or a time when good short-term responsiveness is required Just-in-Case outperforms Just-in-Time. In almost all other times, JIT is superior.

In the field of health, the absence of sufficient gowns, gloves, and testing packets created difficult conditions for the general public and political decision-makers alike (Brakman et al 2020). Some reports that these goods were supplied by JIT-oriented companies made the need for JIC buffer stocks more apparent. Political figures have also weighed into this area and ‘demanded’ that commercial organizations be better prepared for crises such as global pandemics (Ortiz 2022).

In the field of produce and agriculture the application of JIT or JIC is not widely studied (Labs 2019). However, companies usually try to minimize the time fresh goods spend in transit and storage so that they can be sold to the final consumer in good condition (Ray 2003). While there may be no specific commitment to JIT in these industrial areas, there is a tacit tendency to favor JIT to reduce spoilage and lost value (Loedding et al 2014). Yet, the occasional voice can be heard claiming that companies should have a more JIC oriented approach to make sure that sufficient stocks are available at times of crisis.

Before the drumbeat advocating Just-In-Case systems becomes too loud (Brakman et al 2020), it would be as well to check whether there is any proof of;

- a) a transition from JIT to JIC; and then
- b) that JIC outperforms JIT on any meaningful metrics.

The following data analysis drives toward a) and b) by using data from the Wharton Research Data Services (WRDS) database. More specifically, the Compustat - Capital IQ database which provides fundamental and market information from U.S. and Canadian publicly held companies obtained from the owners and these have been quoted in Barbados dollars (BBD). Local businesses were also contacted to obtain cost estimates for items such as materials for constructing aquaponics, seedlings, fish feed and any other costs which the farmer could not provide.

### 3. Analysis

The data used is for the period 2016 to 2021, using Standard Industrial Classification (SIC) Codes for US-based companies as a primary search parameter. All companies reporting as operating in the industries with SIC Codes 001 to 1001 are included in this sample set. This includes companies

operating in the area of Growing and Harvesting Fresh Produce, Fishing, Forestry and similar primary industries. The search was enhanced by seeking out accounting data for “Beginning Inventory”, “Work in Progress Inventory”, and “Final Inventory”. That was further refined by subtracting “Beginning Inventory” from “Final Inventory” to provide an approximate estimate of Value Added by the firms included in the sample. While this approach uses manipulated data it is easier to work with than digging through company balance sheets and using data from those sources. Provided the reporting is accurate, the numbers should be the same.

If there is any change of inventory management from JIT to JIC we would expect to find that Beginning Inventory or Final Inventory would go up significantly as companies in the fresh food supply chain adapt to changing conditions and build buffer stocks.

The six-year period was marked by a number of external ‘shocks’ to the supply chain, including Tsunamis (Japan 2011), Hurricanes (Ida, Louisiana USA; Sally, Alabama USA, 2020), various Tornados, Suez Canal Blockage (2021 Ever Given ship turned sideways) and a trade war between the USA and China (starting 2016). Some of these ‘shocks’ had the potential to interrupt ‘business as usual’ and possibly encourage a transition toward Just-In-Case inventory management.

Table 2 reports the data found in the above search, in index/standardized form using 2016 as a base year (100). The goal here is to allow easier year-on-year comparison.

**Table 2 - Inventory for Companies in SIC Codes 001-1001 2016-2021 (Index Values)**

Year	2016	2017	2018	2019	2020	2021
Beginning Inventory (Raw Materials)	100	99.86	99.63	98.54	98.25	97.81
Work in Progress Inventory	100	99.88	99.68	98.64	98.40	98.02
Final Inventory	100	99.74	99.36	98.15	97.70	97.14
Value Added	100	99.90	100.14	98.36	97.98	97.91

## 4. Results

The data provided in Table 2 offer a slightly unusual angle on inventory data in the field of primary industry production and distribution. The observable trend in the data for each category is not supportive of the hypothesis of a transition from JIT to JIC. For instance, in Table 2 Beginning Inventories started at 100 (2016) and ended at 97.81 (2021). Final Inventories Started at 100 (2016) and ended at 97.91 (2021). Given that this period has been one of low inflation and low interest rates, there is likely less impact from price movements. In each case, the data suggests the opposite of a trend toward higher inventory levels or Just-In-Case inventory management.

## 5. Caveats, Discussion and Recommendations

The earlier sections of this paper discussed the calls for companies (and to a certain extent government agencies) to adopt a transition from “Just in Time” to “Just in Case”. If such a transition occurs the implications could be quite serious for smaller Caribbean companies and economies based in the islands.

First, it must be made clear that data on primary industries (including fresh food production and inventory) cannot be a definitive study of this

subject. It takes a lot of time to adjust a system that has taken decades to adopt the JIT approach (Ray 2003, Ortiz 2019).

Even with this caveat, the good news is that the data for US-based companies indicates that no such transition is taking place. If anything, companies in the US are more likely to be doubling down on Just-in-Time inventory management. While we cannot extrapolate directly to the situation facing Caribbean-based growers and processors, from this data we can infer that US companies and assets are aligned with JIT inventory management and not JIC. This indicates that there is less pressure on SIDS producers and companies to buy assets and for governments to build infrastructure in support of changes in business operations.

One clear recommendation is for observers and regulators to pay close attention to the data in this field. It is not real-time data and decisions cannot be followed up with investments quickly. However, if the need to transition becomes urgent, plans and funding of said plans could be prepared for quick implementation.

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## 6. Conclusion

This paper responds to the claims of certain commentators that inventory systems have to build greater flexibility so they can achieve Just-In-Case buffer stocks, rather than be wholly invested in Just-in-Time distribution and storage systems. The data demonstrates US-based companies in the field of fresh produce have made not shift from JIT to JIC. While this may happen in the future, at this time there appears to be no such shift. The needs of other industrial areas may be different and the data may paint an entirely different picture.

SIDS governments which host many fresh produce companies, do not need to find funding for additional investments at this time. However,

being prepared for a time when those investments are required would be a good and appropriate step now or in the very near future.

## REFERENCES

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- Blackhurst J. and Balthrop A. (a) "It's Time to Move Beyond Just in Time and Just in Case", *Logistics Management* No. 4, 2023, Vol. 62, 18
- Blackhurst J. and Balthrop A. [b] "It's Time to Move Beyond Just in Time to Just in Case". *Supply Chain Management Review*, No 1, (Jan/Feb 2023), Vol. 27, 52
- Brakman S., Garretsen H., and van Witteloostuijn A. "Pandemic may cause structural changes in supply chains and lead to an increase in buffer stocks", *Social Sciences and Humanities*, No. 1 2020,
- Guerrero P., Lucenti, K., and Galarza S. "Trade Logistics and Regional Integration in Latin America and The Caribbean" (2010), ADBI Working paper #233 [ssrn.com/abstract/1654307](https://ssrn.com/abstract/1654307)
- Harrington L. "From Just in Time to Just in Case", *ATW Air Transport Network*, No. 4, (2007),77
- Khorna S. Escaith H., Ali. S, Kumari S., and Do Q. (2022) "The changing contours of global value chains Post Covid: Evidence from the Commonwealth", *Journal of Business Research*, 153 (Dec. 2022): 75-86
- Labs W. "Think Lean, Be Green and Prosper" *Food Engineering*, May 2019
- Loedding H., Nyhuis P., Schmidt M. and Kuyumcu A. "Modelling Lateness and Schedule Reliability: How Companies Can Produce on Time", *Production Planning and Control*, 25 (No. 1 2014), 59
- Martha J. and Subbakrishna S., "Targeting a Just in Case supply chain for the inevitable next disaster", *Supply Chain Review*, 6, (No. 5 2002), 18
- Ortiz J. (2022) "Spread Too Thin: The Impact of Lean Inventories", *International Financial Discussion Papers 1342*, Washington Board of Governors of the Federal Reserve System
- Ray D. "Excess Capacity Still Problem For Farmers", *Southwest Farm Press*, July 3, 2003, p.23

