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A Follow-Up on the Economic Impact of Special Economic Zones in Honduras: Can Honduran ZEDEs and "Growth Hubs" Leapfrog Institutional & Economic Development?[23]

Daniel Fernández [1] & Olav A. Dirkmaat[1]

1. Universidad Francisco Marroquin

Abstract

The main cause of migration from Honduras to the United States is a lack of economic opportunities. The price mechanism provides signals for complementary production factors to be combined in the most efficient manner possible. The lack of (nonhuman) capital in Honduras induces workers to search for opportunities in other places where capital is more abundant. Conventional economic theory also suggests that nonhuman capital will flow to low-investment countries with poorly equipped workers. However, this is a conditional statement that would only be true under a business friendly institutional environment, which at present is not the case of wider Honduras. However, our model suggests that the institutional framework of the Honduran ZEDE has the ability to produce a business-friendly environment and, consequently, pull a large share of the Honduran people out of poverty.

Resumen

La principal causa de la migración de Honduras a Estados Unidos es la falta de oportunidades económicas. El mecanismo de precios proporciona señales para que los factores de producción complementarios se combinen de la manera más eficiente posible. La falta de capital (no humano) en Honduras induce a los trabajadores a buscar oportunidades en otros lugares donde el capital es más abundante. La teoría económica convencional también sugiere que el capital no humano fluirá hacia países de baja inversión con trabajadores mal equipados. Sin embargo, esta es una declaración

[23] Originaly published in: UFM Market Trends, https://trends.ufm.edu/en/report/honduras-zede-2020/.

condicional que solo sería cierta en un entorno institucional favorable a los negocios, lo cual, en general, en la actualidad no es el caso de Honduras. Sin embargo, nuestro modelo sugiere que el marco institucional de la ZEDE hondureña tiene la capacidad de producir un entorno favorable a los negocios y, en consecuencia, sacar a una gran parte de la población hondureña de la pobreza.

Abbreviations

DAFZA	Dubai Airport Free Zone Authority (based in Dubai)
JAFZA	Jebel Ali Free Zone Authority (based in Dubai)
FTZ	Free Trade Zone
GDP	Gross domestic product
HN	Honduras
OECD	Organisation for Economic Co-operation and Development
SEZ	Special Economic Zone
TECOM	Technology, Electronic Commerce and Media (TECOM), free zone authority (in Dubai)
ZEDE	Zone for Employment and Economic Development

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1. INTRODUCTION

1.1. Progress Since Our Last Study

Last year, the authors of this paper published a study on the economic impact of so-called *Zones for Economic Development* (ZEDEs) in Honduras, a special type of special economic zone (SEZ). Our 2019 study discussed the success and failure of SEZs in China, Dubai, and India in the past. Then, it projected potential Honduran GDP per capita with and without ZEDEs. A Honduras *with* a successful ZEDE showed, for the region, tremendous potential. In effect, if done well, a SEZ can serve as a shortcut toward an investor-friendly tax code, regulatory regime, and judicial efficiency. In turn, this can lead to the rapid economic development of the region, turning previously impoverished and investment-ridden lands into hubs of prosperity. Nonetheless, much has changed since our first publication. As the inner workings of the ZEDE have become clearer (especially with the recent launch of Honduras' first ZEDE, Honduras Próspera) and its governance structure is now evident, its potential should also be reassessed.

In our original study, we assumed that (a) there would be one ZEDE and (b) part of the population would move into the ZEDE (in our study, we projected country-wide GDP per capita assuming 10%, 20% and 30% of the total population would be inside the ZEDE). However, the current prospect is that the Próspera ZEDE will also expand to new territories in a geographical sense. This goes far beyond the notion of a part of the Honduran workforce moving into ZEDE territory. In effect, as we will explain here, the ZEDE Constitutional Amendment and Organic Law allows for rapid growth by establishing multiple hubs. Some of these would operate under the same ZEDE management but are allowed to compete against each other in terms of regulations and infrastructure. They can, indeed, adopt the legal, regulatory and fiscal framework of an overarching ZEDE, such as the Próspera ZEDE.

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A proliferation of so-called "growth hubs" might occur. In this paper, we define "growth hub" as the expansion and reach of the original ZEDE into other areas.

This model resembles, as we will also explain later, Dubai's model to a certain degree. In Dubai, many free zones exist. Próspera's growth hubs would be equivalent to the latter. Nonetheless, Dubai's free zones are managed by only a few select free zone authorities (the equivalent of ZEDEs in Honduras). For example, the Technology, E-Commerce and Media Free Zone (TECOM) Authority manages ten free zones. Other free zone authorities, such as DAFZA & JAFZA, also administer various free zones. DAFZA is considered by many the most effective free zone administrator. If the Próspera ZEDE can match this administrative efficiency, and if competition emerges between growth hubs[i], then the potential impact on the Honduran economy could be even greater than originally estimated. The situation might be even greater than initially estimated due to the global reconfiguration of supply chains brought by the COVID19 pandemic. In this paper, we consider that the Honduran ZEDE could impact even more positively than we originally estimated.

For instance, the COVID19 pandemic exposed the supply chain vulnerabilities of many countries around the world, including those of many U.S.-based businesses. The Próspera ZEDE appears to be well-positioned to take advantage of such a reshuffling of global production. Therefore, in this paper we review the new elements that have come to light over the past year (2020), what their impact will be on the Honduran economy, and how this might affect our initial projection of the ZEDE's economic potential.

1.2. Ease of Doing Business within the Próspera Economic Zone

We begin with the question: what are some of those new things that have come to light? According to a recent report by Ernst & Young (2019), Honduras Próspera allows for a giant leap on most of the Honduran Ease of Doing Business component scores, especially with regard to: (i) starting a business, (ii) (construction) permits, (iii) registering property, (iv)

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getting credit, (v) taxes, (vi) cross border trade, and (vii) enforcing contracts. Enormous regulatory and institutional strides are made, almost overnight, within the Honduran ZEDE. According to the same E&Y study, these benefits would lead to a (potential) initial investment of almost 50% of total foreign direct investment Honduras received, on average, from 2012 to 2017. Especially worth highlighting are the immediate improvements in ease of doing business concerning labor laws, environmental protection laws and the judicial system.

Labor laws, although workers within the ZEDE command a 10% premium on the national minimum wage, are extremely flexible. The Próspera ZEDE, as well as Dubai's free zones, operates as a one-stop shop for bureaucracy. This simplifies and speeds up enormously the regulatory red tape involved in establishing and operating a business. However, the advantage of the Próspera ZEDE over Dubai's free zones, is the freedom of a business to adopt its own set of regulations. In practice, this can mean adopting the regulations of another country or any other set of regulations approved by the Próspera ZEDE Council. And, last, the Próspera ZEDE allows for default arbitration under a common law legal code[ii], where arbitration awards have the legal equivalence of domestic court resolutions. This implies a rather staggering improvement in judicial efficiency (turnaround time) and lower total cost associated with legal processes. Some of these improvements are reflected in the following components of the Ease of Doing Business score:

Table 1: Ease of Doing Business in the Próspera ZEDE compared to Honduras

	Honduras	**Próspera ZEDE[iii]**
OECD Labor Restrictions Score (Scale 0-5)	2.4	0.5
Starting a business: number of steps	11	3

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Starting a business: number of days	42	1
Obtaining permits: number of steps	17	1
Obtaining permits: number of days	32	1

Source: Honduras Próspera, Ernst & Young

There exists a strong relationship between ease of doing business and economic prosperity (Estevão et al., 2020). Even more interesting, the same study shows that reducing the difficulties of dealing with government bureaucracy is even more important than a more efficient financial system (Estevão et al., 2020). The components of the Ease of Doing Business Index most important for higher GDP are mostly related to regulatory issues (that is, red tape). Other studies confirm the importance of ease of doing business with regard to economic development (Besley, 2015).

1.3. The Potential of a Honduran ZEDE: Hondurans Prosper in Non-Honduran Institutional Contexts

One reason for optimism regarding the success of the Honduran ZEDEs is the enormous leap in productivity and wages of Honduran immigrants in the United States: this leap might be an indication of how the institutional context of a worker (in this case, a Honduran worker) drives his/her productivity and affects his/her wage compensation. Honduras is one of the countries with the lowest income per capita in Latin America. Within the Central American region, as can be observed in the following chart, only Nicaragua has lower levels of income than Honduras.

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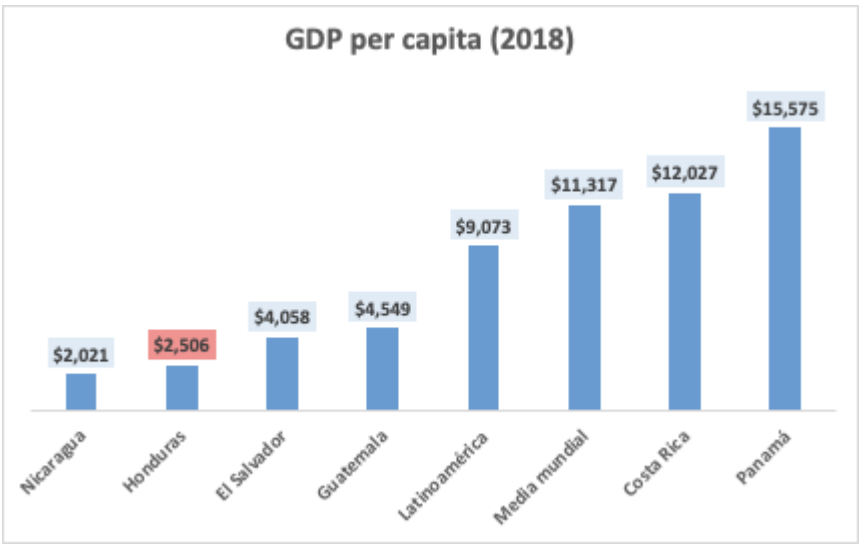


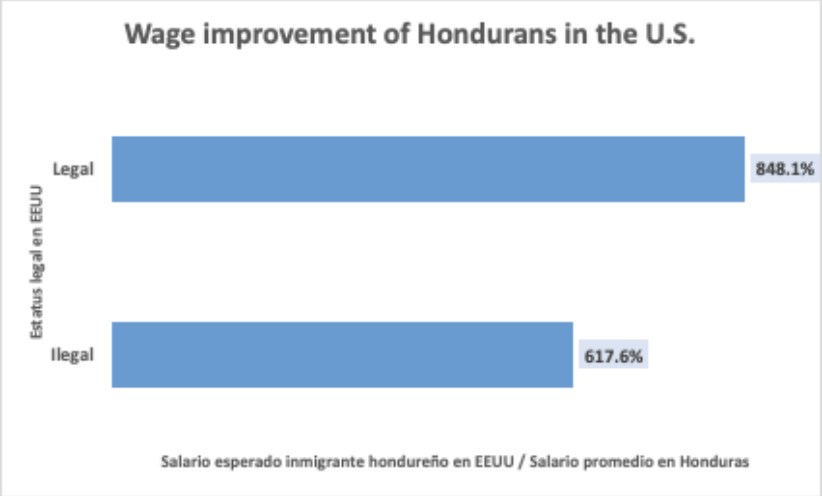
Source: World Bank, income levels in constant dollars.

There exist various causes as to why countries are unable to achieve higher levels of income per capita and economic development. Even though the ultimate causes of low levels of economic development can be very profound, the immediate causes, according to institutional economics, can be more easily identified: an institutional framework that thwarts or prevents free enterprise and the accumulation of capital.

The lack of (well-invested) capital prevents an increase in the productivity of labor[iv]. The development of human capital is, as a type of complementary capital, indeed disincentivized by a more general lack of capital. In these cases, an ambitious educational program could have the unwanted effect of triggering an outflow of talent from the country, because of the country's inability to provide jobs for the educated, due to a lack of complementary capital[v]. Therefore, low levels of education are not a cause of low levels of economic development, but a consequence, especially of an institutional scheme that is unable to provide sufficient capital in the economy. The institutional backdrop is key when it comes to developing economic well being. Hondurans thrive in institutional contexts

different from the one in their home country. This could be among the primary causes of the massive migration movements that spur from Honduras.

The average Honduran can employ their labor capacity in a much more beneficial manner in the United States than in Honduras. Therefore, it is often rational to migrate from Honduras to the United States, in some cases even illegally, despite the high risk involved with irregular migration. We can estimate, with data from Penn World Tables 9.1, the wage multiplier that an average Honduran worker might expect when they migrate to the United States.



Source: author's calculations with data from Penn World Tables 9.1 and Pew Research Center. The data from Pew Research Center refers to Latino immigrants. The data presented has been weighed according to human capital (lower in Honduras than even in the other Latin American countries)

The Honduran ZEDE has the ability to replicate, in the longer run, or even exceed, the successful institutional context that exists in the United States. As a result, Hondurans would no longer be compelled to migrate in pursuit of better labor opportunities[vi].

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2. The ZEDE In Its Current Shape: Comparisons to China & Dubai

2.1. The Honduras Próspera "Growth Hub" Model: Resemblances with China & Dubai

As mentioned in the introduction, as the ZEDE has taken shape and was officially launched, some surprising elements have crystallized. We can summarize some of the aspects of the Honduras ZEDEs as follows:

1. Honduras Próspera is the first Honduran ZEDE, but competition between ZEDE authorities is allowed and possible. The barrier to entry to form a ZEDE is, however, substantial, as the scope of ZEDEs is so broad that it takes a great effort to comply with all of its requirements. That said, there are already, at least, two additional ZEDEs in the making: Ciudad Morazán and Orquídea. It is likely that multiple ZEDEs will be competing against one another in the future.
2. Besides competition between ZEDEs, it is more likely that there will be competition between "growth hubs" (explain Why? Is it because of the relatively not so difficult yet not trivial costs of setting a ZEDE up? Be more precise. The reader will appreciate it). In this case, Honduras Próspera acts (or "can act"?)as an enabler of a network of economic zones ("growth hubs", essentially subdivisions) across the country. If the Honduras Próspera provides, for instance, standardized legal services across growth hubs, this could (a) increase the number of people that live within a ZEDE drastically within short timeframes and (b) accelerate the economic impact of the ZEDE in the country. All this while leaving much of a growth hub's autonomy to itself.
3. The process of forming new hubs under the Próspera ZEDE is transparent and open to the entire Honduran population. It is a voluntary process by which landowners or people ask to join the Próspera ZEDE's legal framework. It is important to note that Próspera ZEDE cannot legally expropriate any land to expand the jurisdiction. This

could dramatically improve the lives of many Hondurans, as it serves, for instance, to bypass the failing judicial system by simply incorporating into the ZEDE. This would lead to a uniform legal system that could improve upon current judicial processes.

4. A growth hub can be authorized anywhere in the country, which means that the Próspera ZEDE and its governance could cover any of the areas as mentioned by the Inter-American Development Bank (IDB). IDB (2019) recommends the creation of "growth poles" outside existing trade routes that would diversify production in the Honduran economy both geographically as in terms of industries. This "growth pole" strategy can very well coincide and even thrive with the ZEDE's ability to expand territory.

Now we will briefly discuss how this institutional arrangement could allow the Honduran ZEDE to mimic the success cases of China and Dubai. First, it is important to understand the difference between the China model and the Dubai model. In particular, it should be noted that many of China's free zones have enjoyed a longer period of existence to be able to develop, whereas Dubai's free zones are of more recent creation. That is, the first SEZ in Dubai, in its today's shape, emerged in 1990, when the Dubai government created the Dubai Port Authority (a commercial company) to take over the management of the only free zone in Dubai. When in the mid-1990s it became clear the free zone would run out of land, new free zones were proposed. Various free zone authorities emerged, which can administer multiple free zones at once. Whenever land becomes scarce, free zone authorities have been allowed to expand territory by setting up new free zone areas. As a result, most of Dubai's free zones originate from the past twenty years, signifying the immense development that Dubai has been through in a relatively short period.

On the contrary, many of China's success stories originate from 1980 to 1984, that is, the Chinese free zones took longer to develop. Shenzhen, for example, was turned into a free zone in 1979-80. One of the key differences with Dubai is the ability to expand: a successful

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free zone authority (equivalent of a Honduran ZEDE) in Dubai can incorporate new land quite easily, without any need for the land to be adjacent to the original SEZ. In the case of the Chinese SEZs, such adjacency is by definition necessary and there are clear limits to the supply of land under any given free zone management (in China, every special economic zone has their own management). In essence, this means that, while in Dubai a few efficient free zone operators ("authorities") have gained a majority of market share, successful free zone authorities in China cannot acquire other free zones to manage. That is, a more efficient free zone authority cannot absorb less efficient free zone authorities.

In this sense, it must be noted that not every special economic zone in China is as successful as Shenzhen's. For instance, even though improvements have been quite positive, Hainan ($7,000 GDP per capita) pales by comparison to Shenzhen. The China model becomes even more complex when we consider the scale of Chinese economic zones. For instance, Zhuhai, a Chinese city in the Guangdong province, was designated a SEZ in 1980. Nonetheless, even within Zhuhai, there are a variety of other free zones (equivalents of Próspera's "growth hubs" or "growth poles")[vii], such as the Zhuhai Free Trade Zone (Zhuhai FTZ), which was founded in 1996 and has its own administrative committee. It appears that at least part of the Chinese success can be attributed to competition between free zones (especially smaller ones that thrive under the management of larger economic zones).

In light of this, an interesting empirical observation is that Chinese regions with multiple SEZs have experienced a better economic performance than regions with a single SEZ (Crane et al., 2018). Indeed, it might be the case that a country benefits from the competition between different zone authorities (administrations), which allows for trial-and-error of different approaches and styles, taking into account any local peculiarities. In fact, this has been one of the contributing factors to Dubai's free zone success story[viii].

It is important to note that the ZEDE and its growth hub model, which allows the incorporation of any land in Honduras into the Próspera ZEDE as long as both the landowner and the ZEDE come to a mutual agreement, mimics the Dubai model better than the China

model, and could even improve upon the Dubai institutional arrangement. More importantly, it appears that the Próspera ZEDE's institutional design allows for the expansion of efficient SEZ management and competition between "growth hubs" that incorporate into the Próspera ZEDE, combining the best of "both worlds" (Dubai and China).

Country	Number of special economic zones (SEZs)	Number of SEZ administrators
United Arab Emirates (Dubai)	45	3*
China	120**	120***

*Currently, the three major free zone authorities are DAFZA, JAFZA and TECOM. TECOM, for example, manages more than 10 free zones.

** This number includes the 6 original SEZs established between 1980-85, as well as 14 coastal cities, 15 free trade zones, 32 state-level economic development zones and 53 high-tech industrial development zones. It is likely that the number of economic zones is greater than 120.

*** We assume one administrative authority per economic zone. It must be noted that the administrative authorities are appointed by and large by the Chinese Communist Party. In China, various free zone authorities have been removed and replaced due to corruption, even in Shenzhen.

In addition, one of the key factors behind Dubai's success is zone specialization: the clustering of firms operating in virtually the same industry allows for facility sharing and resource pooling. The Próspera ZEDE's growth hubs could help cluster industry in certain areas of the country[ix]. This generates a network effect, which attracts additional investment and additional companies to move to the Próspera ZEDE's growth hub. In other words, growth hub creation (as a subset of the ZEDE), facilitates network effects, especially since growth hubs can be established in any given place within Honduran territory.

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2.2. The Supply of land and the Próspera ZEDE

A crucial factor in the potential success of the Honduran ZEDEs is their ability to incorporate new plots of land if both the landowner(s) and the ZEDE administrator (in this case, Hónduras Prospera) reach an agreement. The current law allows for non-adjacent plots. This means that a ZEDE could have "subdivisions" across the entire country of Honduras. In this way, we conjecture that the Honduran ZEDEs avoid one of the most common problems that failed special economic zones have suffered: the problem of land assignment and the potential problems regarding corruption in assigning land[x].

The existence of multiple ZEDEs would even imply that landowners are able to pick between various institutional designs that compete among each other. The institutional scheme designed by competing ZEDEs must be sufficiently attractive to:

1. Convince landowners to abandon their current institutional framework (that is, the institutional framework prevalent in today's Honduras)
2. Convince landowners to stick with their ZEDE and not move to another ZEDE

In sum, we conclude that the Honduran ZEDE, as it emerged, combines the best of the Dubai and China model, enabling both the expansion of (the same) management to any region of the country, as well as enabling competition between ZEDEs but, more importantly, between "growth hubs" under the platform of one ZEDE. To our knowledge, only one ZEDE has created this capability so far: the Próspera ZEDE.

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3. The Economic Potential of the Honduran ZEDEs

3.1 A Quick Overview of Our Initial Study

Our initial study used two methods to project potential GDP per capita inside and outside the Honduran ZEDE. In our first attempt, we used GDP growth rates observed in the Chinese special economic zones from 1985 to 2017 (on average, 10.03% annual growth rate). This would lead to a $35,000 GDP per capita in 2050. Moreover, in the first attempt, we also contemplated spillover and derived demand effects, using data from Guizhou and Tibet from 1985 to 2000, to estimate growth rates outside the Honduran ZEDE. While this would lead to a $5,000 Honduran GDP per capita in 2050 outside the ZEDE, the difference with the base case (Honduran GDP per capita continues to grow at its current rate) is minimal, in line with existing academic literature. Last, we used three simple scenarios to estimate the average Honduran GDP per capita, by assuming 10%, 20% and 30% of total population to be within a ZEDE. This would bring average Honduran GDP per capita to $8,000, $11,000, and $14,000 after 30 years, respectively.

In our second attempt, we used a dynamic regression model with the Global Competitiveness Index as independent variable. In this case, we assumed that the Honduran ZEDE would converge to the highest scores (general score) on the Global Competitiveness Index. It is assumed a third of the total Honduran population would end up within the ZEDE, and no spillover effects are assumed to the Honduran economy outside the ZEDE.

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Method	Base case (no ZEDE) in Year 30	Average (country-wide) GDP per capita in Year 30	GDP per capita outside Honduran ZEDE in Year 30	GDP per capita within the Honduran ZEDE (or ZEDEs) in Year 30
China SEZ extrapolation	$3,500	$8,000 - $14,000	$5,000	$35,000
Dynamic regression model w/*Global Competitiveness Index*	$4,000	$6,000	$4,000	$14,000

Source: UFM Market Trends (2019), estimates are rounded.

3.1. A Follow-Up Study: What Is the Economic Potential of the Próspera ZEDE?

As a follow-up on our initial study, in which we used average growth rates in Chinese SEZs, we now take the success case of Shenzhen and model not only GDP growth, but also population growth. Shenzhen (historic) GDP growth rates have been collected from the Shenzhen Statistics Bureau and the Shenzhen Statistical Yearbook and Shenzhen (historic) population growth rates have been calculated from population figures obtained through PopulationStat. This provides us with the following growth rates:

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Population:	Shenzhen (historic data, Y1 = start of SEZ)	Honduras (forecast, Y1 = 2020)
Year 1 to year 10	+31.7%	+1.6%
Year 10 to year 20	+21.0%	1.3%
Year 20 to year 40	+3.2%	0.9%

Sources: PopulationStat & United Nations, *Department of Economic and Social Affairs*, Population Division. World Population Prospects: The 2019 Revision. (Medium-fertility variant)

GDP:	Shenzhen (historic data, Y1 = start of SEZ)	Honduras (forecast, Y1 = 2020)
Year 1 to year 5	+55%	+3.5%
Year 5 to year 10	+35%	
Year 10 to year 15	+30%	
Year 15 to year 20	+20%	
Year 20 to year 30	+15%	
Year 30 to year 40	+10%	
(Geometric) average growth	+20.04%	

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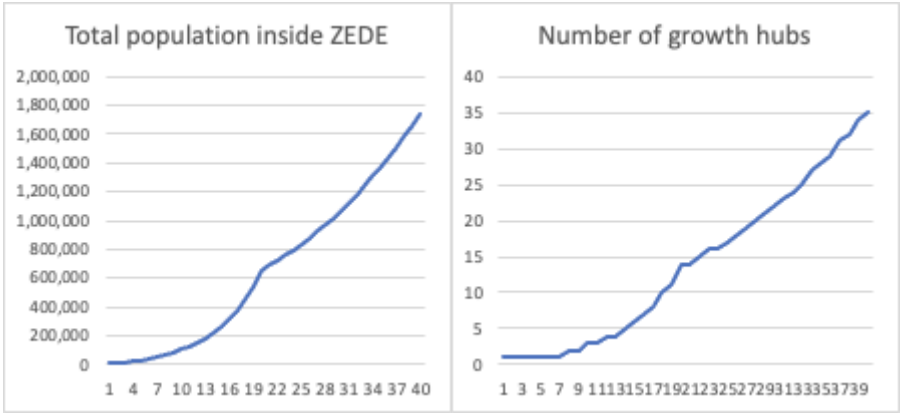
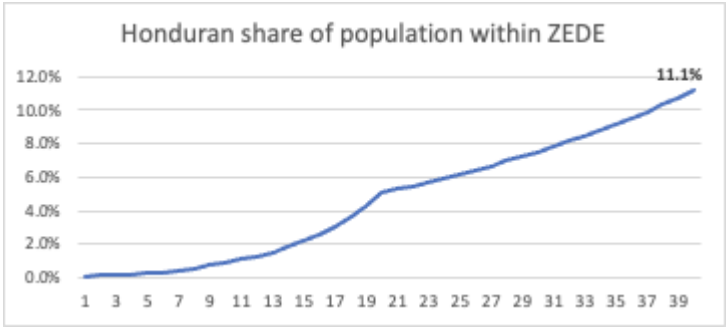
Sources: Shenzhen Statistics Bureau & Shenzhen Statistical Yearbook, Standard & Poors[xi].

Moreover, we assume a starting population of 10,000 in the Próspera ZEDE, and a 50,000 population per growth hub. Applying the Shenzhen population growth rates, we would obtain the following results (from year 1 to year 40):



In terms of population share (ZEDE population as percentage of total Honduran population), this can be summarized as follows and is similar to our initial study of 2019:



However, even though the Próspera ZEDE would only account for 11.1% of Honduran population, it would account for 49.9% of Honduran GDP.

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3.2. Monte Carlo Simulation: What is the ZEDE's Potential in a Best-Case Scenario?

3.2.1. Methodology

Monte Carlo simulations are employed to model the probability of varying outcomes of a phenomenon that cannot be easily predicted because of the presence and large impact of random variables. It is a technique that can be used, in this case, to study the (both downward and upward) uncertainty regarding a forecasting model[xii]. In other words, more than a forecast, our Monte Carlo simulation will show the potential of the Próspera ZEDE. It will show how sensitive the result (described in Paragraph 3.2) is to changes, especially in order to understand the Próspera ZEDE's prospects.

We have decided to vary the following input variables:

- GDP growth
- Population growth inside the ZEDE

Essentially, we have applied normal distributions to these two variables to the 40 years projected, with the means being the same as the optimistic scenario discussed in Paragraph 3.2 and gradually falling standard deviations as time passes:

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Rate	Years	Mean	Standard deviation
GDP growth rate	**Year 1 to year 5**	55%	25%
	Year 5 to year 10	35%	20%
	Year 10 to year 15	30%	20%
	Year 15 to year 20	20%	10%
	Year 20 to year 30	15%	10%
Population growth rate (inside ZEDE)	**Year 1 to year 10**	30%	25%
	Year 10 to year 20	20%	20%
	Year 20 to year 40	5%	10%

This implies, for example, that there is a 13.6% chance that the GDP growth rate from year 1 to year 5 in our Monte Carlo simulation is between 5% and 30% and a 13.6% chance between 80% and 105%. This does not necessarily imply that every year will show extreme growth (as is the latter case), as the variation in the mean growth (and standard deviation of the mean growth) over the 40 years period reveals:

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Outcome variable	Minimum	Maximum	Mean	Median	Standard deviation
40-year average (*geometric mean*) GDP growth rate	10.60%	23.82%	17.73%	17.75%	1.99%
Y1-Y10 average ZEDE population growth rate	-71.68%	124.35%	30.00%	30.00%	25.00%
Y10-Y20 average ZEDE population growth rate	-56.26%	103.57%	20.00%	20.00%	20.00%
Y20-Y30 average ZEDE population growth rate	-34.00%	50.831%	5.00%	4.99%	10.00%

Here we can also observe that even if our minimum growth rate is around 10%, population growth rate can reach, for example, 20%, which would in fact turn GDP per capita growth negative. This would thus represent the case of failure of the ZEDE to lift growth. Other possible failures might be seen in a large abandonment (move away) of residents from the ZEDE, which is exemplified by the minimum (an extreme) of -72% in the first 10 years. Other assumptions (input variables) remain the same (and are thus not varied):

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Rate	Years	Level
GDP growth rate of Honduras (outside ZEDE)	**Year 1 to year 40**	3.5%
General population growth (Honduras)	**Year 1 to year 10**	1.6%
	Year 10 to year 20	1.3%
	Year 20 to year 40	0.9%

As one is able to observe, in line with the literature, no *spillover effects* are considered. We then run a Monte Carlo simulation[xiii] of 100,000 iterations with the input variables discussed above. A summary of the results can be found below.

3.2.2. Results

Given the input variables and their respective standard deviations, there would be a 90% chance that (countrywide) GDP per capita in Honduras would fall between $7,782 and $21,902 dollars per capita. There would be a 5% probability of Honduran GDP per capita to exceed $21,902: in this case, the Próspera ZEDE would be highly successful in promoting economic growth (high GDP growth rates) and highly successful in creating new and additional "growth hubs", occupying a larger share of total Honduran population (high Próspera ZEDE population growth rates). In comparison, Chile, which is now considered the most developed country in Latin America, boasts a $14,896 GDP per capita (2019) according to the World Bank. In other words, in roughly a generation, a successful Próspera ZEDE would be able to lift Honduran economic wellbeing to today's Chilean standards, not only for Hondurans inside the ZEDEs, but for a majority of Hondurans[xiv]. In fact, this would be

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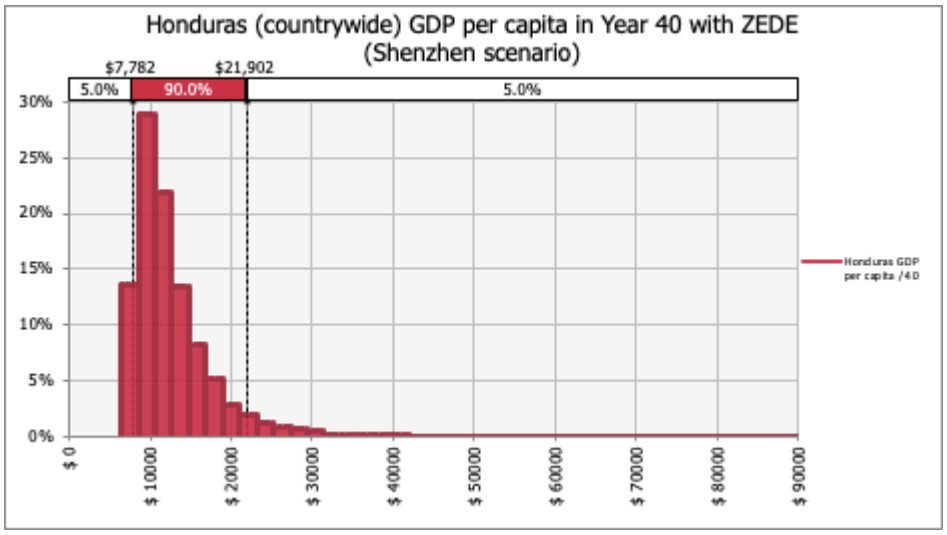
sufficient for Honduras to be included in the "high income" group of countries, a classification used by the OECD.

Below, you will find a visual summary of the Monte Carlo simulation.



It is interesting to observe the long-tailed relative frequency distribution, with a lot of upside potential. Whereas the downside is limited (the failure of the ZEDE to proliferate, attract investment, and lift growth), the upside is rather unpredictable but potentially high. Technically, we could state that the upside potential of the ZEDE is fat-tailed to the right (resembling a power law distribution), a characteristic it shares, for example, with exit values of venture capital investments.

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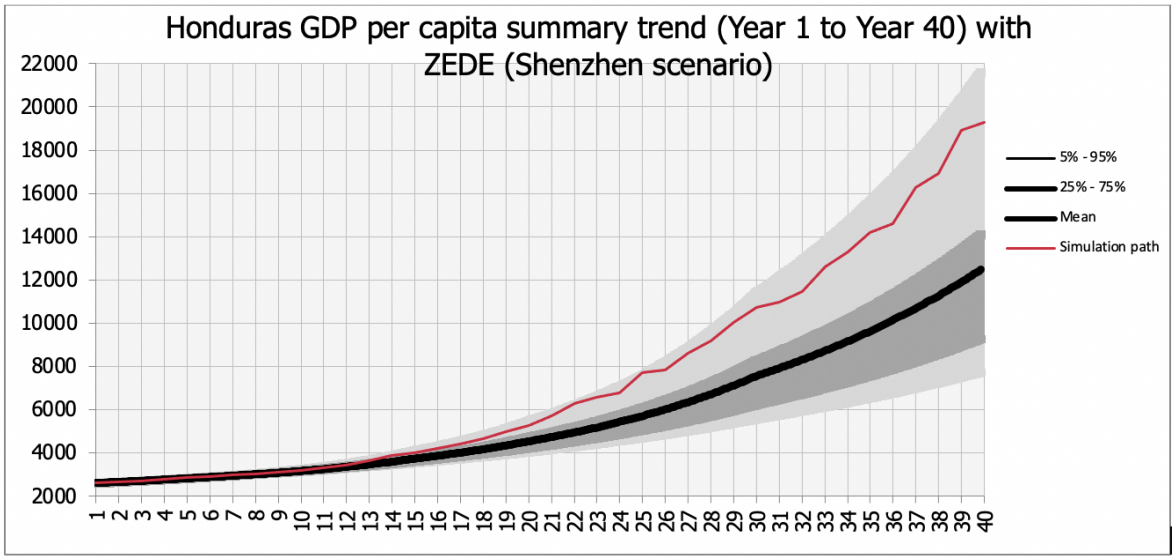
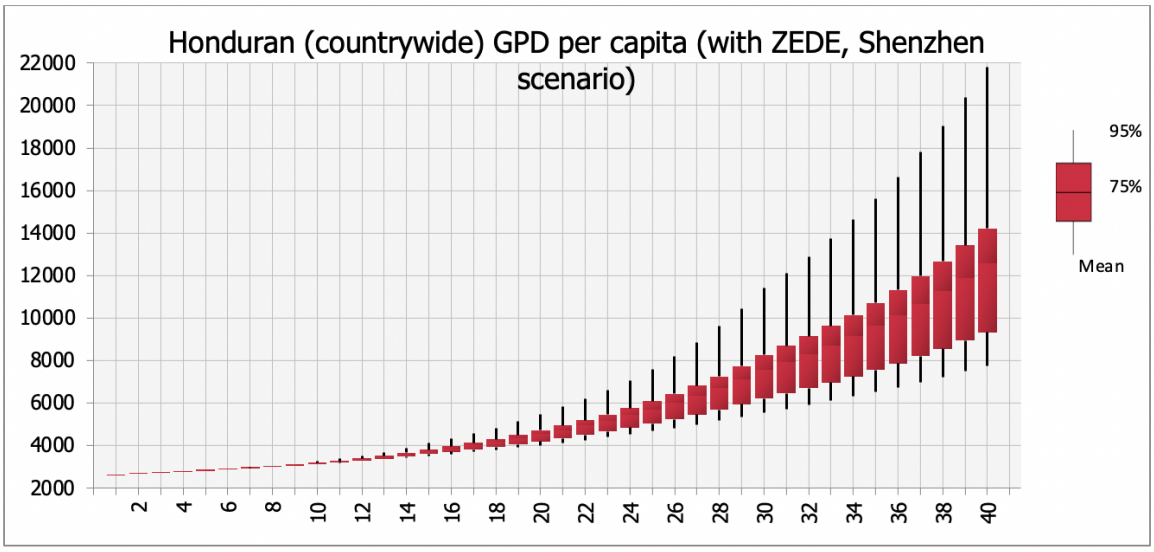


In the above chart, we can see the variance in our Monte Carlo simulation with Shenzhen scenario inputs over time (from year 1 to year 40).



Another way to visualize the result of our Monte Carlo simulation (100,000 iterations) is through boxplots, as can be observed in the chart above.

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	Minimum	Maximum	Median
Number of "growth hubs" (one ZEDE)	1	1202	27

The number of "growth hubs", as a result from our simulation, is also interesting. The median number of growth hubs (27) is very close to the current number of special economic zones in Dubai (35), which we have mentioned earlier. The minimum (1) would entail a failure, as no new (viable) growth hubs would emerge beyond the initial one, launched in Roatán, Honduras.

Method	Base case (no ZEDE) in Year 40	Average[xv] (country-wide) GDP per capita in Year 40	GDP per capita outside Honduran ZEDE in Year 40	GDP per capita within the Honduran ZEDE (or ZEDEs) in Year 40
Shenzhen scenario + Monte Carlo simulation	$6,300	$19,296	$6,300	$57,048 *(median)*

As can be observed in the table summary of our initial study, this implies an improvement in GDP per capita within the Próspera ZEDE of 62% compared to our initial simple average Chinese free zone growth estimate and of 307% compared to our dynamic regression model (which used the Global Competitiveness Index score as independent variable). It should be noted that our projection in this case is over a 40-year period, whereas our original estimates are projections over a 30-year period.

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Nonetheless, in both cases, the Monte Carlo simulation shows greater economic potential than first estimated in our 2019 study, although probability-wise, even under a Shenzhen scenario with high levels of uncertainty (as is reflected in the standard deviations applied), lower values, or even values that would imply a failure of the ZEDE, can be observed.

4. Conclusions

4.1. Will the ZEDEs Shape the Future of Honduras?

The Honduran ZEDEs, in particular the Próspera ZEDE and its growth hubs, have the ability to shape the future of Honduras. As one of the poorest countries of the region, the ZEDEs are a way to introduce urgently needed market reforms to the country. It is very well possible that the Próspera ZEDE's growth hubs will proliferate across the country, if the first growth hubs are successful and thus able to exemplify the potential of the Próspera ZEDE, especially since the institutional design avoids all the pitfalls committed in, for example, India.

A particular challenge to the region is the deficient legal system, with a general lack of judges (few judges with high caseload), long legal turn-around times, low court quality, and unreliable enforcement[xvi]. This made it necessary to expand the reach of the Honduran ZEDEs (which is not customary in other parts of the world). This could hugely contribute to the future success of the Honduran economic zones.

It appears the Honduran ZEDE regime, with the launch of Honduras Próspera, has delivered on almost every key factor that is required for economic success, especially when it comes to judicial efficiency, regulations and land assignment. The Honduran ZEDE, although scarcely touted, could set a new standard for special economic zones not only in the Central American region, but in the world.

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4.2. What Could Go Wrong? Risks to Be Considered

The potential of the Próspera ZEDE to drive economic growth in the country is vast, as we have shown in the Monte Carlo simulation. Nonetheless, risks exist, which could negatively affect the development of the ZEDEs. We will briefly discuss some of the risks that we consider most important:

4.2.1. A reversal of the institutional environment

Latin American countries often stand out because of their institutional instability. Therefore, there exists a risk that the legislation that facilitates the creation of ZEDEs (and, ultimately, growth hubs) will be repealed or modified substantially at a future point in time.

If and when the ZEDE population exceeds a level of 100,000 residents, there will be a referendum aimed at evaluating the possibility of introducing certain amendments to the ZEDE legislation. Fortunately, there exist strong constitutional safeguards, which will make it highly difficult to modify the legislation behind the special economic zones. A qualified majority of two thirds is required in the Honduran congress to modify the constitutional articles that underpin the ZEDE legislation. As a result, a significant change in rules is rather unlikely.

4.2.2. Rigidities imposed by the Honduran government

As we have commented in our initial study on ZEDEs published in 2019, the decentralization of authority and administrative functions is an indispensable prerequisite for a well-performing SEZ. The Honduran ZEDEs have a high probability of success due to their high degree of decentralization and autonomy relative to the central Honduran government.

When the ZEDEs begin to attain success, it is possible that the central Honduran government might take an "interest" in the growth hubs and aim to recoup some of its authority, after ceding most of it to the ZEDEs.

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4.2.3. Access to electricity

Honduras harbors one of the worst electric power systems in Central America. According to the Ease of Doing Business Index, published by the World Bank, the Honduran electric power system occupies position 138 (of 190) in the world. The electric power supply in Honduras is unpredictable, with above average power outages[xvii].

This might be a problem when it comes to investments which require considerable amounts of electricity (such as heavy industry) or investments in which the stability of the electric power supply is crucial (certain types of tourism or even virtually the entire tourist industry).

It is possible that the ability of the ZEDEs to build infrastructure leads to a more stable supply of electricity, but this will undoubtedly remain a challenge.

5. References

Besley, T. (2015). Law, regulation, and the business climate: The nature and influence of the World Bank Doing Business project. *Journal of Economic Perspectives, 29*(3), 99-120.

Crane, B., et al. (2018). China's special economic zones: an analysis of policy to reduce regional disparities. *Regional Studies, Regional Science, 5*(1), 98-107.

Ernst & Young (EY). (2019). *Project Oasis: Commercial Due Diligence - Special Economic Zone Honduras.*

Estevão, J., et al. (2020, July). The Doing Business ranking and the GDP. A qualitative study. *Journal of Business Research, 115*, 435-442.

Inter-American Development Bank (IDB). (2019). *Honduras: A Territorial Approach to Development.* Inter-American Development Bank (IDB).

Moberg, L. (2015). *The Political Economy of Special Economic Zones.* Fairfax, VA.

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[i] As we will discuss later, industrial clustering is a clear possibility under the current ZEDE set-up, which would lead to network effects, economies of scale and resource sharing.
[ii] This is done through the Próspera Arbitration Center (PAC). More information can be found here.
[iii] As provided by Próspera ZEDE.
[iv] Capital should not only be accumulated, but must be accumulated in profitable investments in order for capital formation to be sustainable. To achieve this, it is necessary that the market feedback mechanism is allowed to work (this prevents the accumulation of capital that generates little added value). Therefore, it is crucial to avoid subsidies on the accumulation of capital or public investments (by definition, public investments are made based on political rather than economic considerations.
[v] The return on labor specialization (human capital) is only positive when there exists a place to put to work such specialized skills. For instance, it does not make sense to train nuclear engineers in a country without nuclear power plants to employ them.
[vi] The ultimate causes of migration can be manifold. The ZEDE can only diminish and, in the most optimistic of cases, end *economically motivated* migration.
[vii] The city of Zhuhai currently houses four special economic zones.
[viii] It appears part of the success in Dubai is due to the administration's transparency and easy access to information. The Honduran ZEDE Próspera appears to have made a promising start in that regard, given the ample information and resource center on their website.
[ix] Again, an interesting take can be found in the Inter-American Development Bank's report (2019) on Honduras.
[x] An interesting case study regarding this aspect are the special economic zones in India. Also see Moberg (2015).
[xi] "We expect GDP growth to (...) hover around 3.5% in the next couple of years." (S&P Global)
[xii] Other methodologies might be considered. We used *this* specific methodology because, first, we consider that transaction cost economics are unable to explain the economic development of poor countries (poor to rich) and, therefore, consider a transaction-cost based comparative static analysis not a good fit for our study. Moreover, our main objective was to explore the economic potential of a successful special economic zone for Honduras as a country. Similarly, public choice modelling would not properly capture the effects of FDI, which we assume is the greatest benefit of introducing SEZs. Both techniques might be more apt for developed countries, because they analyze "what is" instead of "what can be."
[xiii] An easy, nontechnical description of the Monte Carlo simulation method can be found here.
[xiv] It would be interesting to study the dynamics of within-country inequality, as has happened in China, which has led to massive migration toward free economic zone areas from non-free economic zone areas. The key advantage of the Honduran ZEDE is its ability to expand geographically on a voluntary basis, without any need for government approval or initiative (as is the case in China).
[xv] This is the result (year 40) of the simulation path; if we would continue to do iterations ad infinitum we would end up with a mean (as depicted in Chart X) of $12,562).

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[xvi] The World Bank expresses the same challenge as follows: "It [the Honduran government] recognizes that Honduras' ineffective legal framework and judicial institutions negatively impact the investment climate and worsen conditions for the poor."
[xvii] According to the World Bank, businesses in Honduran endure, on average, 2.4 days a month some type of interruption in the supply of electricity. Even Nicaragua, the poorest country in the region, has less power outages on average than Honduras.

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Medical Countermeasure Manufacturing Zones: A Proposed Tool for the Pandemic Response

Anya Vanecek[1] & Sam Mulopulos

1. Milken Institute School of Public Health

ABSTRACT

Widespread and lingering shortages of medical countermeasures (MCM) continues to hinder the COVID-19 pandemic response. Shortages of personal protective equipment (PPE) have placed healthcare workers, emergency responders, and members of the public at inordinate risk of contracting the disease; a lack of medical supplies, including vaccines, has crippled some hospitals' abilities to provide necessary care. The source of these shortages is a failure to invest in public health resiliency, including an overdependence on the global supply chain. To help solve this problem, this paper proposes the creation of a new special jurisdiction-—Medical Countermeasure Manufacturing Zones (MCMZ). Industries operating in or reshoring production of MCM to these zones would 1) benefit from special tax incentives and 2) gain priority consideration in public purchases, including those made for the Strategic National Stockpile (SNS). Priority purchasing consideration provides the strong demand signal industry requires in order to reshore production. Lastly, these producers would be required to sell to U.S. purchasers before exporting their goods during a declared public health emergency. Making products in the United States and guaranteeing sale of that PPE to U.S. purchasers would help to strengthen the MCM supply chain and ensure that supplies are available in times of public health crisis. This paper takes a United States-centered approach to emergency response, proposing a new type of federal-level special jurisdiction in the United States, called Medical Countermeasure Manufacturing Zones (MCMZ). This model, as we later conclude, could be replicated in other countries in order to grow domestic MCM production and promote greater public health resiliency.

Keywords: Public Health; Medical Countermeasures; Foreign Trade Zones; Manufacturing, United States.

RESUMEN

La escasez generalizada y persistente de contramedidas médicas (MCM) continúa obstaculizando la respuesta a la pandemia de COVID-19. La escasez de equipo de protección personal (EPP) ha puesto a los y las trabajadores(as) de la salud, los servicios de emergencia y el público en un riesgo excesivo de contraer la enfermedad. Igualmente, la falta de suministros médicos, incluidas las vacunas, ha

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mermado la capacidad de algunos hospitales para brindar la atención necesaria. La fuente de esta escasez es la falta de inversión en la resiliencia de la salud pública, incluida una dependencia excesiva de la cadena de suministro global. Para ayudar a resolver este problema, este documento propone la creación de una nueva jurisdicción especial en Estados Unidos: las Zonas de Fabricación de Contramedidas Médicas (MCMZ). Las industrias que operen o reubiquen la producción de MCM en estas zonas 1) se beneficiarían de incentivos fiscales especiales y 2) obtendrían consideración prioritaria en las compras públicas, incluidas las realizadas para la Reserva Nacional Estratégica (SNS). La consideración de compra prioritaria proporciona la fuerte señal de demanda que requiere la industria para repoblar la producción. Por último, estos productores deberían vender a compradores estadounidenses antes de exportar sus productos durante una emergencia de salud pública declarada. Fabricar productos en los Estados Unidos y garantizar la venta de ese PPE a los compradores estadounidenses ayudaría a fortalecer la cadena de suministro de MCM y garantizaría que los suministros estén disponibles en tiempos de crisis de salud pública. Este documento adopta un enfoque centrado en los Estados Unidos para la respuesta de emergencia, proponiendo un nuevo tipo de jurisdicción especial a nivel federal en los Estados Unidos, denominada Zonas de fabricación de contramedidas médicas (MCMZ). Este modelo, como concluimos más adelante, podría replicarse en otros países para aumentar la producción nacional de MCM y promover una mayor resiliencia de la salud pública.

Palabras clave: Salud Pública; Contramedidas médicas; Zonas de Comercio Exterior; Fabricación, Estados Unidos.

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1. INTRODUCTION

By the time it arrived on U.S. shores, the novel coronavirus (COVID-19) confronted a neglected public health and medical infrastructure. The shortages it triggered were predictable and predicted, as was the burden they would impose on frontline workers and healthcare systems across the country. Critics have condemned a lack of preparedness as the root of the issue, citing a lack of sufficient stores and an inability to import and distribute the needed additional medical countermeasures (MCM). What needs further development are solutions that prepare the United States for the next pandemic or other public health emergency. Reshoring manufacturing should be part of that vision.

The Food and Drug Administration (FDA) defines MCM as "products used to diagnose, prevent, protect from, or treat conditions associated with chemical, biological, radiological, or nuclear (CBRN) threats, or emerging infectious diseases." MCM include biologic products, such as vaccines; drugs, such as antibiotics; and devices, including personal protective equipment (PPE) as well as diagnostic tests and ventilators. Both domestically produced and imported products are regulated by the FDA to ensure quality and safety. The existing pandemic response infrastructure, including the Strategic National Stockpile (SNS) and Centers for Disease Control's (CDC) Strategy for Optimizing PPE Supplies, do not offer a sustainable solution for the next pandemic. This is because the existing infrastructure is focused on managing supplies, not creating new ones.

At its establishment in 1998, the SNS was conceived as "an unprecedented national stockpile of drugs and vaccines for civilian use in case of a bioterrorist attack." Its purpose has since expanded to include measures to respond to CBRN threats; pandemic influenza; and natural disasters. However, the SNS was never intended to provide for the needs of state, local, territorial, and tribal governments simultaneously, nor to serve as the primary source for pandemic response resources (Gerstein, 2019). Considering the problems of product expiration and the substantially different needs imposed by CBRN threats,

pandemics, and natural disasters, stockpiling with the goal of fully providing for all needs across all potential public health emergencies is unfeasible. As such, the shortages of MCM—most notably PPE—stem less from a failure to stockpile as from an inability to acquire a sufficient number of quality products when they are needed.

The Centers for Disease Control and Prevention (CDC) Strategy for Optimizing PPE Supplies iterates three capacity levels containing strategies to ensure supplies are adequately matched to need. These strategies have nothing to say about production, importation, or distribution of supplies. Rather, the CDC provides guidance on how to selectively limit the provision of care in order to eliminate competition for limited supply. The presumption underlying this agenda is that, under emergency circumstances, acquiring additional supplies is so unlikely as to not be worth considering (CDC, 2020). "Steps for acquiring necessary supplies" are not offered. This is not a failure of the CDC, whose jurisdiction does not encompass the medical supply chain. The agency can only offer mitigation techniques. Medical facilities and providers, and other frontline workers, would do well to heed CDC guidance, but policymakers should be concerned with the systematic failures which undermine the opportunity to wage an adaptable response to a public health crisis.

As long as the focus of the United States' pandemic response emphasizes existing ways of sourcing MCM, it will always suffer from the pitfalls associated with global supply chains concentrated in a few countries. Increasing the supply of MCM, both for everyday and pandemic-event use, requires reshoring manufacturing of MCM. Since manufacturing benefits from collocation with research and development (R&D) and other similar activities, special jurisdictions can be an effective way of offering incentives for reshoring production to clusters wherein actors from across the MCM industry can operate in close proximity and thereby gain efficiencies and increase innovation.

This paper is structured in five sections. Section II draws upon the historically broad conception of public health to lay out the public health justification for domestic

manufacturing of MCM. Section III discusses some of the weaknesses in global supply chains, especially as it relates to MCM. Section IV proposes the Medical Countermeasures Manufacturing Zone (MCMZ) special jurisdiction, and places the need for an MCMZ in the context of the "industrial commons," which describes the ecosystem of clustered industrial actors in a certain region. Part IV also discusses some potential attributes of MCMZs related to tax incentives and government contracting to help guide policymakers interested in designing such zones. The paper concludes with a brief summary of the arguments and ideas offered throughout, and suggests how this model can be adapted to other countries with similar problems.

2. PUBLIC HEALTH JUSTIFICATION

Although the global supply chain disruptions experienced in the first months of the pandemic averted catastrophe, U.S. purchasers, and the front-line workers they supplied, were confronted with the reality of a system that was not set up to adapt quickly to crisis. Despite the valuable role that medicines and protective equipment play in the epidemiological tool kit, the early response overemphasized quarantine, isolation, and widespread shutdowns. These strategies continue to play an outsized role in the U.S. pandemic response plan. In the United States, citizens have been asked to limit time interactions for ten months through numerous primaries and a general election, multiple national and religious holidays, and one and a half school semesters. The insurmountable difficulty of maintaining social distancing has demonstrated that these policies, though necessary, are not sufficient to control the spread of COVID-19, nor to protect the health and wellbeing of frontline workers (Soo, K., 2020; Williams J., 2020). Access to physical supplies is also essential (Honein, et al. 2020). The United States must develop a strategy to create and deliver more masks, medicine, and other countermeasures, so that its people can survive this crisis.

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2.1. The Need for PPE and MCM

Demand for PPE is estimated to exceed 21.9 million units weekly in the United States ("Shortage Index," 2020). The sources of need include hospitals and clinics, but the vast majority of facilities without sufficient supplies are non-hospitals, including homeless shelters, dental clinics, nursing homes, and social services. In fact, non-hospitals account for approximately 80 percent of need. The individuals who work within these facilities must have access to PPE in order to safely provide the services that their clients rely upon in order to maintain their health and wellbeing. In October 2020, and for the third month in a row, 70 percent of all facilities were entirely out of at least one type of PPE ("Shortage Index," 2020). Part of the issue stems from a lack of NIOSH/FDA approved medical-grade PPE. Whereas face coverings may generally be widely available, the kind needed by frontline workers to assure the highest level of protection remain hard to acquire and expensive. Frontline workers and industries have struggled as a result.

The lack of PPE and MCM at the front lines of the pandemic response has led to horrific outcomes in healthcare and other essential service fields. Shortages of masks and gowns, including reports of doctors and nurses reusing PPE, have come to epitomize the COVID-19 pandemic (Morning Edition, 2020). Healthcare workers have died as a result of this lack of protection (Clark, C., 2020; Karlamange, S., 2020; Gee, A., 2020). When New York City experienced a surge in cases in May 2020, a lack of ventilators threatened to trigger medical rationing (Johnson, M., 2020). Lacking swabs to use for COVID-19 testing, Boston doctors organized former classmates and "an army" of 3D printers to produce their own supply. Overall, the scarcity of swabs has "hobbled" testing in the United States (Mfuson, et al., 2020). So unbalanced are supply and demand for N-95 respirators that an informal market for these supplies has emerged (Clark, D.B., 2020). There is a clear need

for concerted efforts to establish MCM supply chains that can respond quickly and effectively to crisis-level demand.

In recent months, the United States have started to deploy additional MCM in the form of vaccines. Both Pfizer and Moderna—the manufacturers of the two FDA-approved vaccines—are operating at maximum capacity to produce these vaccines (Lupkin); hospitals, pharmacies, and other authorized distributors are operating at maximum capacity within the limitations of their staffing and supplies to deliver them. Vaccines comprise components: mRNA, lipids, potassium chloride, monobasic potassium phosphate, etc. They come in glass vials and are stored in "extreme cold" storage. As with other MCM, a robust vaccine supply chain requires secure and diversified sources for not just the final product, but the component parts as well.

2.2. Toward a Broader Conception of Public Health

Public health is an interdisciplinary field that intersects with medicine and with policy. It aims to promote the health of a population as a whole by dealing with the factors of disease, including hygiene, epidemiology, and disease response, as well as the nonmedical factors of health (also referred to as the "social determinants of health"). One way of conceptualizing public health is to think of illness as something that can be prevented: primary prevention is proactive, aiming to avoid the contraction of disease (i.e. strategies to avoid spreading COVID-19); secondary prevention aims to identify and respond quickly to new cases (i.e. COVID-19 testing and contact tracing); and tertiary prevention seeks to mitigate the effects of a disease that has already been contracted (i.e. reducing the severity of COVID-19 symptoms and avoiding death). MCM plays a role in each of these stages.

In its capacity as advocate for disease prevention, the field of public health ought to be concerned with how the nation shapes and manages the medical supply chain. That the nation has allowed the vast majority of MCM production to offshore demonstrates the lack

of coordination between the public health and manufacturing sectors. It is not that public health officials are unaware of the problem: in early 2020, the U.S. Department of Health and Human Services (HHS) published a report highlighting the problems with the current MCM supply chain under pandemic circumstances (Office of the Assistant Secretary for Preparedness and Response, 2020). It is clear now that HHS was right. The result of a lack of communication between the manufacturing and public health sectors has been an inability to provide a domestic response to material needs during a public health crisis.

At the turn of the last century in American politics, Congress considered some of the first legislation intended to reform the systems which affected public health and wellbeing, including the non-medical factors of health. The proposals of this time understood public health in a way that contemporary politics is only beginning to rediscover. Leadership in the early 1900's "did not simply envision that the sick should be able to purchase medical care," but rather, "viewed poor health as…a problem of the underlying economic structure" (Fairchild, et al., 2010). Though neglected, this viewpoint remains no less pertinent in 2020: when the pandemic hit, insurance could not save the hospital system from collapse; the trade and manufacturing sectors had to do that by ensuring that hospitals and providers were equipped to provide necessary care safely. Moving forward, the United States needs to readopt the early 20th Century's consideration of strategies outside of medicine and money to bolster the nation's defenses against deadly diseases.

The United States' pandemic response problem is contained within its narrow conception of health. Preparedness has similarly been too narrowly conceived. Public health, trade, and manufacturing must work together for the nation to achieve effective pandemic preparedness. Growing the domestic manufacturing sector would enable the nation to scale supply to meet demand during future public health emergencies. Strategic contracts with manufacturers could also sustain spending on the SNS to ensure that stockpiles are sufficiently maintained and consistently replenished.

In addition to providing a more responsive and resilient MCM supply chain, reshoring manufacturing of MCM to the United States could bring about other positive health effects in areas in which factories were reopened. These factories would provide jobs and economic stability to local communities, which can serve to improve health outcomes ("Employment," 2020). The added benefit of domestic MCM manufacturing is renewed investment in an early idea of health promotion: an economic structure more supportive of individual and societal wellbeing.

3. GLOBAL SUPPLY CHAINS CAN HURT THE PANDEMIC RESPONSE

3.1. Dependence on Foreign Imports

The United States' pandemic response has been limited by its excessive reliance on MCM produced overseas. Imports account for an overwhelming percentage of the U.S. supply of many types of MCM. For example, China accounted for over 15 percent of U.S. imports of medical ventilators and over 70 percent of medical protective articles, including masks, in 2019 (U.S.-China Economic and Security Review Commission, 2020). Over 70 percent of active pharmaceutical ingredients (APIs) used in the United States are produced in foreign countries, with over 30 percent made in India and China alone (Kota & Mahoney). It is notable that the Peter Institute for International Economics encouraged nations to scale up domestic MCM production, and the European Union (EU) Chamber of Commerce has specifically urged EU member nations to diversify their supply chains away from China (Brown, C., 2020; Crossley, G., 2020).

The United States' dependence on imports for MCM puts public health at the mercy of foreign governments. In February 2020, the Chinese government commandeered all production of medical supplies for domestic use, limiting even U.S. companies from exporting their Chinese-produced goods (Pinghui & Xin, 2020). Twenty-four EU nations imposed similar export restrictions in March (Bayer, et al., 2020). Without U.S.

manufacturing to scale up MCM production, these gaps often went unfilled. The Congressional Research Service posits that China's attempts to secure sufficient MCM to provide for the needs of its citizens during the pandemic "likely exacerbated medical supply shortages in the United States and other countries, particularly in the absence of domestic emergency measures that might have locked in domestic contracts, facilitated an earlier start to alternative points of production, and restricted exports of key medical supplies" (Sutter, et al., 2020). The same policies which facilitated a steep rise in Chinese MCM production also contributed to sharp decreases in exports of these critical supplies. One expert writes:

> In a dark irony, most of the world's face masks—now ubiquitous in China as a precaution—are made in China and Taiwan, and even for those made elsewhere, some component parts are Chinese-sourced. Shortages have led China to declare the masks a "strategic resource," reserving them for medical workers. U.S. hospitals are "critically low" on respiratory masks, according to medical-supply middlemen. Lack of protective gear could increase vulnerability to the virus, and the one place on earth suffering from production shutdowns is the one place where most of the protective gear originates. (Stoller, M., 2020).

Furthermore, there is evidence that China prioritized certain trade partners over others when exporting MCM. Whereas the United State accounted for 40.9 percent of China's export market for N95 respirator masks—the greatest single holder of market share—in 2019, in 2020 the EU usurped the United States, claiming 34.6 percent of Chinese N95 mask exports compared to the 25.5 percent exported to the United States (Sutter, et al., 2020). Because of the United States' dependence on China, China holds a great deal of leverage to determine American's access to lifesaving supplies. The current crises—public

health and economic—which affected the wellbeing of individuals worldwide, "provides the chance to rethink fundamental assumptions about our country's economic and social system," including the role for public health to lay in shaping policies and practices that promote good health (Fairchild, et al., 2010). Defensive policy decisions may have been rational in light of the dire state of public health within the nations which enacted them at the time. But the fact remains that the United States' reliance on foreign nations undermined its own ability to effectively respond to the pandemic.

3.2. Limitations Inherent to the Global Supply Chain

Even if trade had continued as usual during the pandemic, scaling issues and long shipping times might have undermined the speed and deftness of the U.S. public health response to the crisis. The Crimson Contagion Functional Exercise Series, conducted by HHS between 2018 and 2019, tested the nation's ability to respond to a flu pandemic. The After-Action Report (2020) concluded, among other findings, that "Global manufacturing capabilities will not be sufficient to meet demand, resulting in an inability to import adequate quantities of medical countermeasures" in the event of a pandemic. Stockpiles are inherently limited and would be difficult to restock because both complete products as well as components and materials would have to be imported. Importation can become functionally impossible if any point of the supply chain is disrupted.

To counter this threat, HHS recommended that the United States "Promote growth of the domestic medical countermeasure industrial base with a focus on bolstering input supply chain development (raw materials) and enhancing rapid manufacturing supply" (Office of the Assistant Secretary for Preparedness and Response, 2020). A stronger domestic manufacturing sector would shorten the distance between suppliers, producers, and

purchasers, as well as grant the nation greater control over the end-to-end supply chain that cannot be guaranteed when it spans across nations.

To the extent that supplies exist, their availability is limited by long transportation times. Air travel is by far the fastest mode of transportation across the Pacific Ocean, but it is also the most expensive and can handle only relatively small volumes. Ocean freight is cheaper and can handle larger loads but can take up to a month from port to port (Gronkvist, 2018). Loading and unloading the cargo may account for an additional week of transit time. When needs are immediate, that is too long to wait. Moreover, the global supply chain has made it difficult for U.S. producers to compete in the domestic market. The depletion of the domestic manufacturing sector has negatively impacted public health in the United States in a number of ways. Extremely low production costs overseas, disincentivizes the production of American-made goods, even at times of heightened demand.

Lastly, the role that the U.S. manufacturing sector could play in promoting healthier American communities is undermined by a global supply chain that incentivizes the production of goods offshore. Reshoring manufacturing would also help domestic producers to the healthiness of their communities, through both their production practices and the quality of their products (West & Langsang, 2018). At the same time, reshoring would recreate manufacturing jobs, which would help to address the widespread poverty and poor mental health that arose in many working-class communities as a result of the loss of industry. Poverty and poor mental health have proven to exacerbate the adverse impacts of events like the COVID-19 pandemic (Reeves & Rothwell, 2020). What manufacturing jobs may not be able to offer in work-from-home flexibilities during the pandemic, they may have made up for in providing families with financial safety nets and, indeed, access to supplies that could protect them and others from the virus. When the United States overlooks reshoring, it not only undermines pandemic preparedness but misses an opportunity to promote greater environmental stewardship, worker protections, quality standards, and to reenforce the economic factors that promote wellbeing in local communities.

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4. MEDICAL COUNTERMEASURE MANUFACTURING ZONES

In response to the great reliance that the United States has on foreign suppliers—and in particular China—for MCM, this paper proposes a new type of special jurisdiction to incentivize the reshoring of production of MCM to the United States. Defined by alternative rules that apply with the special jurisdiction, but not the areas outside that jurisdiction, a Medical Countermeasures Manufacturing Zone (MCMZ) would mimic other special jurisdictions already in use (Foreign Trade Zones Act, 1934). MCMZs would be created by the federal government, which would bestow a number of unique privileges upon entities operating within the MCMZ. In this way MCMZs are like other special jurisdictions in both origin and operation.

How MCMZs differ is in their ability to create synergies from the agglomeration of entities engaged in similar activities. Unlike Foreign Trade Zones (FTZs), for example, which are agnostic as to industry, MCMZs would be designed specifically for use by those manufacturing MCM, PPE, and other goods deemed essential to ensure public health preparedness (Foreign Trade Zones Act, 1934).

4.1. Rationale for a Special Jurisdiction

At first it seems unclear why a special jurisdiction would be necessary to encourage reshoring production of MCM. Certainly, the federal government could provide lower taxes or longer contract awards to companies manufacturing MCM anywhere in the United States. What is the need to tie these incentives to a special jurisdiction?

4.1.1. The Case for an Industrial Commons

The short answer is that place matters. When located near each other, different companies from the same industry—even companies in the same industry but specializing in different subsets of that industry—interact in ways that drive innovation, boost efficiencies, and achieve greater success. This concept of an "industrial commons" is what makes special jurisdictions potentially so helpful for improving pandemic responsiveness (Pisano & Shih, 2009).

The industrial commons refers to local or regional "Concentrations involving a particular industry…on the presumption that they will gain an advantage in learning or in hiring workers with relevant skills and knowledge, and by being near suppliers and complementary businesses" (Shih & Chai, 2015). Think Detroit for automobiles, Silicon Valley for computers, the Raleigh-Durham Research Triangle for pharmaceuticals, Pittsburgh for autonomous vehicles, and Boston for biotech. The physical proximity of entities within these industrial commons generates a mass of workers moving between firms and bringing their creativity and expertise with them. This energy can supercharge companies (Shih & Chai, 2015). As one expert notes:

> The potential sources of agglomeration advantages include cheaper and faster supply of intermediate goods and services, proximity to workers or consumers, better quality of worker-firm matches in thicker labor markets, lower risk of unemployment for workers and lower risk of unfilled vacancies for firms following idiosyncratic shocks, and knowledge spillovers. (Greenstone, et al., 2010)

There's good evidence confirming the sound intuition that being physically closer to other experts and workers in one's field generates more success for everyone than if those individuals were scattered. The Internet has been remarkable, especially during the pandemic, at permitting individuals to communicate and collaborate almost as effectively

virtually as in-person. But only almost. Nothing can replicate a chance interaction with a potential collaborator while waiting in line at the coffee shop, or the efficacy of negotiating a solution around a physical table (Pisano & Shih, 2009).

For example, a study of the professional networks in two different research clusters in Denmark—a vibrant life sciences cluster and another a stagnant wireless telecommunications cluster—demonstrates the value of place-based clusters (Shih & Chai, 2015). The thriving life sciences cluster in Copenhagen drew heavily on Danish university students and local talent, cultivating unique local expertise that stayed and flourished in the area. The slack telecommunications cluster, in North Jutland, started strong—Denmark pioneered the development of mobile phones—but began to lag after a series of acquisitions by foreign entities and a weakening pipeline of local talent dispersed expertise (Shih & Chai, 2015). Another study of over 800,000 inventors between the years of 1971 and 2007 found that upon moving to an innovation cluster—the backbone of the industrial commons—an inventor significantly increased the number of patents they produced (Moretti, 2019). Moreover, clustering increased the overall efficiency of both an industry and the rate of innovation within the cluster's home country. According to the same study, the total number of computer science patents in the United States would be more than 13 percent lower if those inventors had been evenly distributed across the country (Moretti, 2019).

4.1.2. The Unraveling of the Industrial Commons in the United States

Unfortunately, the United States has seen a hollowing out of its industrial commons spanning at least the past generation. U.S. manufacturing has dropped from nearly 27 percent of gross domestic product (GDP) in 1990 to 11 percent of GDP today (Kota & Mahoney; FRED, 2020). This decline in manufacturing has been driven by offshoring in pursuit of cost cutting (Kota & Mahoney). Such offshoring has devastated the United States' industrial commons by degrading manufacturing clusters across the country. The ease of

offshoring and the allure of its cost savings makes it difficult for companies to keep their production in the United States. In the case of one study by the Massachusetts Institute of Technology (MIT), 150 start-ups utilizing MIT research relied on domestic skills and financing until it came time to scale production. Then those start-ups were pushed to move production overseas, especially to China (Reynolds, et al., 2014). Even worse, the long-time reassurance—that high-value activities like innovation and research and development (R&D) would stay in the United States even as lower cost manufacturing went overseas—has proven incorrect. In 2000, prior to China's accession to the World Trade Organization (WTO), U.S. corporate R&D expenditures in China were $506 million (U.S.-China Economic and Security Review Commission, 2020). From when China joined the WTO in 2001 until 2018 the U.S. trade deficit with China exploded, and the United States lost 3.7 million jobs (75 percent of which were in manufacturing) to China (Scott & Mokhiber, 2020). Unsurprisingly, R&D has since begun to leave too. As U.S. manufacturing went offshore to China, U.S. R&D expenditures in China ballooned more than 631 percent to $3.7 billion by 2017 (U.S.-China Economic and Security Review Commission, 2020). The tendency for R&D to follow production offshore has not been limited to manufacturing. The same has been true in the pharmaceutical industry (U.S.-China Economic and Security Review Commission, 2020).

The success of the industrial commons derives from its comprehensiveness. Manufacturing, design, and R&D must all be part of the equation in order for companies to see the gains that the industrial commons offers. But when manufacturing moves offshore, R&D follows, leaving behind no commons at all, but instead a wasteland of U.S. headquarters missing innovative vitality that they may not even realize they could have.

4.1.3. MCMZs as Industrial Commons

Special jurisdictions offer an opportunity to rebuild the industrial commons by helping to cluster manufacturing and R&D in certain regions and communities. By their nature,

special jurisdictions involve placing limits on to whom benefits are conferred, and where those entities may be established. In the case of the industrial commons, geographic boundaries are essential because the benefits of the industrial commons only presents itself upon the agglomeration of industrial actors.

By offering a number of special privileges to companies operating in, or relocating to, an area designated as an MCMZ, the United States can not only improve its access to PPE, essential medicines, and other MCM, but also catalyze innovations that are thwarted by distance. An MCMZ focused on PPE manufacturing might be located in parts of the southern United States to draw upon the region's history and expertise in textile manufacturing (Thomas, D., 2020). Ideally, the MCMZ would not just be focused on PPE manufacturing or pharmaceutical production, but instead bring players from these and other related industries together to draw synergies from their physical closeness. Just like in the Danish life sciences cluster, employees taking new jobs with different firms in the cluster would bring with them ideas and expertise that further drive innovation and efficiencies.

The location of MCMZs might even be determined by a competitive application process, with localities competing for the designation and its attendant benefits. The competition for Amazon's second headquarters (HQ2) demonstrated the desire of countless cities to boost their economies with the kind of big investment Amazon promised (over 238 jurisdictions threw their hat in the ring to win the location of HQ2). Yet, the fact that HQ2 was ultimately awarded to communities in New York City and near Washington, D.C. demonstrated the shortcomings of relying upon a single large corporation to be a catalyst for local economic development (Gruber & Johnson, 2019). A similarly competitive process facilitated by the federal government, whose priorities were more holistic than a private sector actor, might motivate experts in MCM research, development, and manufacturing to design for themselves the clusters that make up a healthy industrial commons. The federal benefits associated with designation as an MCMZ would incentivize this collaboration.

To expand the diversity of locations that aspire for MCMZ designations, the determination process may include state and local matching investments, partnerships between industry and area universities, or assessments of affordability or expansion potential. MCMZ designations are ultimately most capable of producing the full span of their benefits if they do not merely double down on established, high-performing cities, but look more broadly (Gruber & Johnson, 2019). Communities throughout the South and industrial heartland possess potential as innovation and manufacturing hubs, yet are often overlooked (Dizikes, P., 2019). A federally run competition for MCMZ status might help to facilitate growth in underdeveloped parts of the United States by prioritizing the creation of MCMZs in these areas.

4.2. Potential Attributes of MCMZs

There are any number of ways to design an MCMZ program in order to incentivize reshoring and the creation of an MCM industrial commons. Below, two possible and probable attributes of MCMZs are considered: tax reduction on corporate income, investment, and research; and greater length of, and priority consideration for, government contract awards. Tying these incentives to a specific geographic location could encourage the creation of clusters that support a healthy industrial commons. While not an exhaustive or exclusive list, these attributes are among the most effective tools that the federal government may have available to incentivize reshoring and encourage manufacturing sector growth in the parts of the United States where such growth is most needed.

4.2.1. Lower Taxes on Income, Investment, and Research

Favorable tax treatment has consistently been a favorite tool of policymakers designing special jurisdictions. Since 1934, FTZs have provided a reduction in tariffs to companies operating within them (Foreign Trade Zones Act, 1934). More recently, Opportunity Zones

provide tax deferral and incentives to those investing in an economically distressed area. With regard to MCMZs, policymakers could consider tax incentives involving multiple aspects. Policymakers might consider reducing the corporate income tax on producers of MCM operating within the MCMZ. They might also consider providing increases for existing tax credits, or the creation of new tax credits, for investment and other R&D activities that occur in the MCMZ.

Policymakers might also consider linking an MCMZ program with the existing FTZ program. Collocation of MCMZs and FTZs would provide duty free access to certain inputs in the manufacturing of MCM. Such collocation would be especially beneficial for companies seeking to export MCM from the zone. Although the purpose of MCMZs are to reshore production to the United States, collocation would not necessarily undermine that aim. Certain inputs or raw materials for different MCM may not be available in the United States, or impossible to reshore. In those situations, collocation with FTZs would further the aim by giving manufacturers less expensive access to those goods, thus making it easier to produce MCM in the United States rather than near the source of those overseas inputs.

4.2.2. Longer Duration of, and Priority Consideration for, Government Contracts

A unique feature of MCMZs would be its ability to offer a federal contracting preference to those companies manufacturing MCM in the zone. Federal contracts are an effective way to send a strong demand signal to private industry assuring manufactures that there will be a market for their products. Combined with domestic content requirements, such as the Berry Amendment for PPE and textile products, federal contracting can be an effective way to incentivize reshoring. But a weak demand signal can be just as useless in this regard as no demand signal.

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For this reason, long-term, or multi-year, contracts are the most effective ways to use the government's contracting power to incentivize reshoring. Yet, almost all of the federal contracts for PPE issued since the start of the COVID-19 pandemic have been short-term: 90 to 120 days. Short-term contracts fail to give industry the certainty that investments in the United States will pay off. Why pay the expense to move a factory from China if after three months no one is around to buy what it produces? This is why industry experts recommend three to five-year long contracts for PPE as one of the most effective means by which the government can incentivize the reshoring of PPE (Glass, K., 2020).

Throughout the pandemic, experts have called for long-term contracts as one of the best policies available to incentivize reshoring of MCM (Adler & Breznitz, 2020). The United States government is the world's largest purchaser of goods and therefore is able to use that immense procurement volume to move markets in strategic directions (Collins & Erickson, 2020). In addition to awarding longer-term contracts, the federal government could also generally give priority consideration for contracts to manufacturers within the MCMZ. The federal government already gives contract preferences to meet specified public policy aims via contracting preferences for veterans or small businesses (Williams, J.T., 2012). Although some might see a contracting preference for a business within an MCMZ as unusual—since the entity in the MCMZ would not necessarily have special status based on its owner's background or size—the federal government does have an existing and geographically based contracting preference: the Buy American Act.

In fact, domestic contract requirements, like the Buy American Act or the Berry Amendment, are already preferences that help incentivize reshoring and limit offshoring. Policymakers could build upon the existing statutory architecture of domestic content requirements to add requirements for longer-term contracts as well as priority consideration for those contracts, when the business being contracted is in an MCMZ. Most relevant to MCMZs and the pandemic response is the Berry Amendment, which requires the Department of Defense to purchase only textile products, clothing, and footwear that are

made entirely in the United States from materials of entirely U.S. origin. Its requirement that the components be U.S. made makes the Berry Amendment one of the strongest of the domestic content requirements in U.S. law (Manuel, et al., 2016). Since the Department of Defense is the agency currently managing pandemic-related procurement, PPE purchases are required to be compliant with the Berry Amendment (Muhammah & Reece, 2020).

According to a survey by the Department of Commerce, two-thirds of companies providing textiles to the U.S. government said that the Berry Amendment had a positive impact on their business (Office of Technology Evaluation, 2017). Of course, those companies' success is in part a result of the business they receive thanks to the Berry Amendment requirement (which limits the amount of competition firms face for federal textile contracts). But, that's the point. If policymakers believe that reshoring MCM is vital for the country's pandemic response—and the evidence seems to suggest that it is—it is necessary for policies to preference those producing in the United States over those producing overseas. The Berry Amendment's popularity with domestic producers demonstrates it success for domestic industry, and combined with the additional attributes discussed above, can be leveraged as part of a contracting strategy designed specifically to target and foster MCMZs as pandemic-fighting industrial commons (Muhammad & Reece, 2020).

5. CONCLUSION

At this point in the COVID-19 pandemic, the death rate is at record highs, shortages of MCM continue, and little ambiguity remains regarding the insufficiency of the global MCM supply chain to respond to U.S. demand during a pandemic. While there are important benefits to trade, undeniable drawbacks emerge where reliance upon global supply chains conflicts with the ability of the United States to respond quickly to demand surges during a pandemic.

Offshoring U.S. manufacturing has undermined preparedness and left the nation vulnerable during a pandemic-level crisis.

The simplest solution is to reshore MCM production, and as this paper argues, to do so using a new type of special jurisdiction designed to foster not just domestic manufacturing of medical countermeasures, but an industrial ecosystem to go with it. This action would not only advance pandemic preparedness by establishing a rapid and scalable domestic supply chain, but also contribute to overall public health by creating jobs and bringing wealth back to depressed communities. While there are a variety of ways for policymakers to design such a zone, this paper contemplated a handful of possible options for MCMZs. But regardless of what they look like, medical countermeasure manufacturing zones offer a fresh answer to the thorny questions that policymakers, for more than a generation, have asked about the difficulty of sparking a manufacturing renaissance in the United States.

The aim of this paper has been to articulate the broad and theoretical case for MCMZs as part of the pandemic response and manufacturing policy tool kit, and urge others in the special jurisdiction, public health, and manufacturing communities to continue to think about, and expand upon, the concepts introduced here. Though focused on the United States, the model presented here is above all an argument in favor of utilizing tax and trade strategies to grow a domestic medical countermeasure manufacturing base that can support any nation through times of heightened need. Using this model, virtually any country could encourage collaboration between their public health and manufacturing sectors, in order to promote greater resiliency and innovation among both.

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http://ojs.instituteforcompgov.org/index.php/jsj
Journal of Special Jurisdictions

6. References

Adler, D. & D. Breznitz. (2020). Reshoring Supply Chains: A Practical Policy Agenda. American Affairs,4(2). https://americanaffairsjournal.org/2020/05/reshoring-supply-chains-a-practical-policy-agenda/

Bayer, L., Deutsch, J., Hanke Vale, J. & Tamma, P. (2020, March 15) EU Moves To Limit Exports of Medical Equipment Outside the Bloc. Politico. https://www.politico.eu/article/coronavirus-eu-limit-exports-medical-equipment/

Berry Amendment. (1994) 10 USC 2533a. https://www.law.cornell.edu/uscode/text/10/2533a

Brown, Chad. (2020, March 26). COVID-19: China's exports of medical supplies provide a ray of hope. Peter Institute for International Economics. https://www.piie.com/blogs/trade-and-investment-policy-watch/covid-19-chinas-exports-medical-supplies-provide-ray-hope

Buy American Act. (1933). 41 U.S.C. §§8301-8305. https://www.law.cornell.edu/uscode/text/41/subtitle-IV/chapter-83

Centers for Disease Control and Prevention. (2020, July 6). Optimizing the Supply of PPE in Healthcare Facilities. Coronavirus Disease. https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/strategies-optimize-ppe-shortages.html

Clark, C. (2020, Sept 2). Nurses Survey: N95 Msk Shortage Still the Rule. Medpage Today. https://www.medpagetoday.com/infectiousdisease/covid19/88419

Clark, D. B. (2020, Nov 17). Inside the Chaotic, Cutthroat Gray Market for N95 Masks. https://www.nytimes.com/2020/11/17/magazine/n95-masks-market-covid.html

Collins, G.B. & Erickson, A.S. (2020, April 23). Economic Statecraft: Options for Reducing U.S. Overdependence on Chinese-supplied Materials and Medications. Rice University Baker Institute for Public Policy. https://www.bakerinstitute.org/media/files/files/000f91f7/bi-report-042320-ces-statecraft.pdf

Crossley, G. (2020, Feb 17). China virus outbreak threatens global drug supplies: European business group. Reuters. https://www.reuters.com/article/us-china-health-pharma-antibiotics/china-virus-outbreak-threatens-global-drug-supplies-european-business-group-idUSKBN20C08S

Dikes, P. (2019, Apr 17). Jump-starting the Economy with Science. MIT News. https://news.mit.edu/2019/public-investment-science-jump-starting-america-0417

Employment. (2020). Healthy People 2020. https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-health/interventions-resources/employment

Fairchild, A. L., Rosner, D., Colgrove, J., Bayer, R., & L. P. Fried. (2010, Jan). The Exodus of Public Health What History Can Tell Us About the Future. The American Journal of Public Health, 100(1): 54-63. https://doi.org/10.2105/AJPH.2009.163956

Foreign Trade Zones Act. (1934). 19 U.S.C. 81a-81u. https://www.law.cornell.edu/topn/foreign_trade_zones_act

FRED. (2020). Relative Importance Weights (Contribution to the Total Industrial Production Index): Manufacturing (SIC) [Graphic]. Federal Reserve Bank of St. Louis. Last updated Nov 17, 2020. https://fred.stlouisfed.org/series/RIWB00004S

Gee, A. (2020, Oct 7). Texas doctor, 28, dies of Covid: 'She wore the same mask for weeks, if not months.' The Guardian. https://www.theguardian.com/us-news/2020/oct/07/texas-doctor-adeline-fagan-covid-coronavirus

Gerstein, D.M. (2020). The Strategic National Stockpile and COVIDD-19: Rethinking the Stockpile. RAND Corporation. https://www.rand.org/content/dam/rand/pubs/testimonies/CTA500/CTA530-1/RAND_CTA530-1.pdf

Greenstone, M., Hornbeck, R., & E. Moretti. (2010). Identifying Agglomeration Spillovers. Journal of Political Economy; 2010, 118(3): 536-599.

Glass, K. (2020, Sept 23). USITC Hearing: Investigation No. 332-580 – COVID-19 Related Goods: The U.S. Industry, Market, Trade, and Supply Chain Challenge; NCTO

Request to Testify. NCTO. http://www.ncto.org/wp-content/uploads/2020/09/ITC-Oral-Testimony-9.23.2020-FINAL.pdf

Gronkvist, F. (2018, Oct 4). How long does it take to ship from China? China Importal. https://www.chinaimportal.com/blog/how-long-does-it-take-to-ship-from-china/

Gruber, J. & S. Johnson. (2019). Jump-Starting America. Hatchette Book Group, Inc.

Honein, M.A., Christie, A., Rose, D.A., Brooks, J.T., Meaney-Delman, D., Cohn, A., Sauber-Schatz, E.K., Walker, A., McDonald, L.C., Lburd, L.C., Hall, J.E., Fry, A.M., Hall, A.J., Gupta, N., Kuhnert, W.L., Yoon, P.W., Gundlapalli, A.V., Beach, M.J., & Walke, H.T. (2020) Summary of Guidance for Public Health Strategies to Address High Levels of Community Transmission of SARS-CoV-2 and Related Deaths, December 2020. MMWR Morb Mortal Wkly Rep, 69, 1860-1867. DOI: 10.15585/mmwr.mm6949e2

Johnson, M. (2020, Apr 3). De Blasio: NYC can 'only get to Monday or Tuesday' with current ventilator supply. The Hill. https://thehill.com/homenews/state-watch/490982-de-blasio-nyc-can-only-get-to-monday-or-tuesday-with-current-ventilators

Karlamanga, S. (2020, May 10). A nurse without anN95 mask raced in to treat a 'code blue' patient. She died 14 days later. Los Angeles Times. https://www.latimes.com/california/story/2020-05-10/nurse-death-n95-covid-19-patients-coronavirus-hollywood-presbyterian

Kota, S. & Mahoney, T.C. (n.d.). Loss of the Industrial Commons is an Existential Threat to U.S. Prosperity. Manufacturing Policy Initiative. https://manufacturingpolicy.indiana.edu/doc/2020/kota-mahoney-2020.pdf

Lupkin, Sydney. (2021, Jan 22). Moderna And Pfizer Need To Nearly Double COVID-19 Vaccine Deliveries To Meet Goals. NPR. npr.org/sections/health-shots/2021/01/22/959732433/moderna-and-pfizer-need-to-nearly-double-covid-19-vaccine-deliveries-to-meet-goa

Manuel, K. M, Dolan, A.M., Murrill, B.J., Perry, R.M., & S.P. Mulligan. (2016). Domestic Content Restrictions: The Buy American Act and Complementary Provisions of Federal Law. Congressional Research Service. https://fas.org/sgp/crs/misc/R43354.pdf

Mfuson, S., Timberg, C., & M. Tiku. (2020, April 22). When these Boston doctors ran out of virus-testing swabs, they mobilized an army of 3-D printers. The Washington Post. https://www.washingtonpost.com/climate-environment/2020/04/22/nasal-swabs-shortage-coronavirus/

Moretti, E. (2019). The Effect of High-Tech Clusters on the Productivity of Top Inventors. National Bureau of Economic Research. https://www.nber.org/papers/w26270

Morning Edition. (2020, Sept 26). PPE Shortages Persist Nearly 9 Months Into the Coronavirus Pandemic. NPR. https://www.npr.org/2020/11/26/939286976/ppe-shortages-persist-nearly-9-months-into-the-coronavirus-pandemic

Muhammad, M. & B. Reece. (2020, Nov 2). DLA ensures textiles-based PPE is American-made per Berry Amendment. Defense Logistics Agency. https://www.dla.mil/AboutDLA/News/NewsArticleView/Article/2401504/dla-ensures-textiles-based-ppe-is-american-made-per-berry-amendment/

Office of the Assistant Secretary for Preparedness and Response. (2020, Jan). Crimson Contagion 2019 Functional Exercise After-Action Report, 2020. Department of Health and Human Services. (Obtained under the Freedom of Information Act from Government Attic; requested as "A copy of the internal After-Action Report and internal Final Report for the Crimson Contagion exercise, 2019" May 4, 2020; received October 5, 2020). https://www.governmentattic.org/38docs/HHSaarCrimsonContAAR_2020.pdf

Office of Technology Evaluation. (2017) Defense Industrial Base Assessment of the U.S. Textile and Apparel Industry. U.S. Department of Commerce, Bureau of Industry and Security. https://www.bis.doc.gov/index.php/documents/technology-

evaluation/2262-bis-defense-industrual-base-assessment-of-the-u-s-textile-and-apparel-industry-2017/file

Opportunity Zones Frequently Asked Questions. (n.d.) IRS. Retrieved Dec 9, 2020 from https://www.irs.gov/credits-deductions/opportunity-zones-frequently-asked-questions#general

Pinghui, Z. & Xin, Z. (2020, Feb 3). Coronavirus: China Shifts Responsibility Over Medical Supplies Amid Mask Shortage, Rising Death Toll. South China Morning Post. https://www.scmp.com/economy/china-economy/article/3048744/coronavirus-mask-shortage-prompts-beijing-tweak-authority

Pisano, G. P., & W.C. Shih. (2009) Restoring American competitiveness. Harvard Business Review; 2009, July-August. https://hbr.org/2009/07/restoring-american-competitiveness

Reeves, R.V. & J. Rockwell. (2020, Mar 27). Class and COVID-19: How the less affluent face double risk. Brookings Institute. https://www.brookings.edu/blog/up-front/2020/03/27/class-and-covid-how-the-less-affluent-face-double-risks/

Reynolds, E.B., Samel, H.M.,& Lawrence, J. (2014) Learning by building: Complementary assets and the migration of capabilities in U.S. innovative firms. In R.M. Locke & R.L. Wellhausen (Eds.), Production in the Innovation Economy. MIT Press.

Scott, R.E. & Z. Mokhiber. (2020, Jan 30). Growing China trade deficit cost 3.7 million American jobs between 2001 and 2018. Economic Policy Institute. https://www.epi.org/publication/growing-china-trade-deficits-costs-us-jobs/

Shih, W.C., and S. Chai. (2015) What to know about locating in a cluster. Sloan Review; 2015, Fall. https://sloanreview.mit.edu/article/what-to-know-about-locating-in-a-cluster/

Shortage Index. (2020, October). Get Us PPE. https://getusppe.org/data

Soo, K. (2020, Nov 27) 1,311 People Died of COVID on Thanksgiving Day in the U.S. Newsweek. https://www.newsweek.com/coronavirus-us-death-toll-thanksgiving-travel-infections-cases-hospitalizations-1550760

Available at
http://ojs.instituteforcompgov.org/index.php/jsj
Journal of Special Jurisdictions

Stoller, M. (2020, Feb 13). Coronavirus and Concentration: Should FDA Have Anti-Monopoly Authority? Substack. https://mattstoller.substack.com/p/coronavirus-and-concentration-should

Sutter, K.M., Sutherland, M.D., & Schwarzenberg, A.B. (2020, Oct 8). COVID-19: China Medical Supply Chains and Broader Trade Issues. Congressional Research Service. https://crsreports.congress.gov/product/pdf/R/R46304

Thomas, D. (2020) Fashionopolis: Why What We Wear Matters. Penguin Random House.

U.S.-China Economic and Security Review Commission. (2020, Dec). 2020 Report to Congress. USCC. https://www.uscc.gov/sites/default/files/2020-12/2020_Annual_Report_to_Congress.pdf

West, D.M. & C. Langsang. (2018, July 10). Global Manufacturing Scorecard: How the US Compares to 18 Other Nations. Brookings Institute. https://www.brookings.edu/research/global-manufacturing-scorecard-how-the-us-compares-to-18-other-nations/

Williams, J. (2020, Dec 4). Study finds social distancing compliance sank to low in October ahead of coronavirus surge. The Hill. https://thehill.com/policy/healthcare/528740-study-finds-social-distancing-compliance-sank-to-low-in-october-ahead-of

Williams, J. T. (2012). Veterans first va should give vet contracting program priority. Procurement Lawyer, 47(2): 1-27.