Is A Lockdown Worth It?

Over a third of the global population at some point has been in lockdown since China implemented lockdown measures on January 23rd, due to COVID-19 (Lifting lockdowns). Under unprecedented circumstances, countries reacted differently. While some chose to implement more stringent standards of lockdown, others had little change. As aspiring economists, it's imminent that we probe and interpret whether the varying lockdown measures were worth the cost. To do so, we chose four countries and did a case study analysis on them. For us to obtain a clear idea, we had to look at examples of countries on both ends of the spectrum - strict and non-strict countries.

To represent a non-strict take on lockdown measures, Sweden and Egypt were fitting. Sweden remains to be the country that took the most relaxed approach of any it's EU counterparts (Milne), and similarly Egypt opted for a looser lockdown - contrary to its neighbouring nations (Egypt). To contrast Egypt, India is the best choice. With a similar median age and large population, it was the perfect fit. To exemplify India's strictness, 60% of citizens were in lockdown for three months at the risk of its GDP projected to take a hit of 45% in the second quarter (Brown). In the case of Sweden, Spain was the counterpart we chose. According to The Guardian, it remains to be "one of the strictest coronavirus lockdowns in Europe," functioning as the perfect opposite (Jones). The question that remains now is: Are lockdown measures worth the cost? Does cross-country evidence confirm the success of lockdown measures? This paper delves deeper into these questions by employing economic data and finding patterns between the degree of measures and COVID-19 related health and economic indicators across the countries. By investigating connections related to new cases and deaths per million, as well as the effect of the measures on inflation, we hope to draw a well-informed conclusion.

To confirm the four chosen countries are fit to represent polar takes on measures of lockdown, we calculate the average stringency for each nation. The results below (*Figure 1*) conclude that both Sweden and Egypt are far less strict than their counterparts, Spain, and India, as asserted by the articles given.

Now let's begin examining if the two pairs of countries each have a positive correlation with daily increased cases per million. If so, what is the strength of that relationship? A positive correlation will show that patients are increasing with time; we're interested in how this relationship varies between strict and non-strict countries—this aids in answering whether these countries' measures were worth the costs. Rationally speaking, the countries with a stronger relationship between marginal daily cases per million and time will show that their efforts were ineffective since it didn't prevent citizens from contracting the virus drastically.

The results from the scatterplot (*Figure 2)* show that against India, Egypt's marginal daily cases against time results in a stronger positive correlation. Computing the correlation, we get a coefficient of 0.7790 for Egypt, whereas, for India, we get a coefficient of 0.7735 (*Figure 3).* Therefore, although by a slight difference, over time, Egypt's cases increased more even if they believed mild measures would work in their favour (Egypt).

Let's explore the counterparts Sweden and Spain (*Figure 4, Figure 5).* By merely observing the scatterplot, it's apparent in figure 4, Spain initially has increasing cases, but quickly experiences a sharp drop. On the contrary, the strict complement, Sweden, undergoes a relatively strong positive relationship. Figure 5 below highlights the findings in Figure 4, from day 75 onwards. To confirm this observation, we compute the correlation coefficients for both. Figure 6 below outlines, that Sweden's marginal daily cases per million against time have a coefficient of 0.8518. However, Spain has a low coefficient of 0.3529. These findings support that the lockdown measures are worth the cost; fewer lives were subject to COVID-19 with stricter policies.

It is not enough to investigate just the marginal increase in cases of the virus; the death toll is equally essential (Ho). Although this pandemic was unforeseeable, it's easy to imagine how a country's lack of attention to the effectiveness of its measures can escalate to a high death toll.

To paint a picture of interdependence between measures, we take a look at the correlation between India and Egypt against marginal daily deaths per million. The scatterplot below (*Figure 7)* shows both countries death tolls increase, even though distinctive measures are in place. Calculating the correlation, we get a coefficient of 0.7904 for India (*Figure 8)*, whereas, for Egypt, we get a coefficient of 0.8011 (*Figure 9).* This spells out that having few measures still resulted in slightly more deaths. Taken conversely, this also could imply a stricter lockdown acted only slightly differently. The difference between Egypt and India still isn't enough to make a conclusive statement.

To better our analysis, we look at the second set of counterpart countries; Spain and Sweden. Borne out in the scatterplot (*Figure 10)*, Sweden once again has higher marginal deaths, while Spain experiences a drop. There is one outlier that showcases Spain's marginal death toll in the negatives; this is one such case and therefore can be ignored as it does not drastically change the conclusion. The correlation coefficients (*Figure 11*, *Figure 12)* reaffirm this statement with polar values of 0.3513 and 0.6480. Therefore, it's apparent that stricter measures do save lives, and the cross-country evidence can back this up.

Lastly, to round up the data, let's examine the change in inflation rate throughout the pandemic. The inflation rate has more or less acted as a reliable indicator of the stability of a country. Following this thought, we box plot the inflation rate of Spain and Sweden (*Figure 13, Figure 14)* - due to lack of data, we were unable to compare Egypt and India. Both countries faced drastic price changes. To gain a more accurate picture of Sweden without the outlier, we cube root the data (*Figure 15*). Upon examining the five-number summary (*Figure 16*, *Figure 17)*, it's evident Spain has a slightly more spread out rate of inflation due to the higher standard deviation. Spain's economy, in turn, is like to be more vulnerable with increased uncertainty around its prices. However, since the two standard deviations are not too far apart, regardless, both countries are at risk of severe contraction. Further research also reveals although Sweden has relaxed measures, its economy is likely to suffer as much as the rest of Europe's (Ellyatt). We can thus conclude that having stricter standards is more beneficial, because regardless of the measures, the economy will become uncertain, so you'd instead not put the lives of citizens at stake.

Upon investigation, the four countries have allowed us to answer our questions. It is a simple truth that no economy can survive without citizens; during this pandemic, it is evident protecting the lives of the people are bound to be worth the cost of strict measures. From lower marginal cases to death tolls, the evidence is sufficient. Cross - country examination, along with articles confirm that although there is no serious threat of non-strict standards, the long-term economy is bound to suffer more if it loses too many citizens. As aspiring economists, we're glad the *data also* chooses to put the lives of people over temporary financial gains.

Figures

```
. mean (egyptStringency)
Mean estimation                 Number of obs   =       145

                    |       Mean   Std. Err.      [95% Conf. Interval]
--------------------+------------------------------------------------
egyptStringency     |   37.51628   3.38733       30.82096    44.21159

. mean (sweStringency)
Mean estimation                 Number of obs   =       149

                    |       Mean   Std. Err.      [95% Conf. Interval]
--------------------+------------------------------------------------
sweStringency       |   21.19174   1.717709      17.79734    24.58615

. mean (indStringency)
Mean estimation                 Number of obs   =       149

                    |       Mean   Std. Err.      [95% Conf. Interval]
--------------------+------------------------------------------------
indStringency       |   49.15611   3.388557      42.4599     55.85231

. mean (espStringency)
Mean estimation                 Number of obs   =       148

                    |       Mean   Std. Err.      [95% Conf. Interval]
--------------------+------------------------------------------------
espStringency       |   45.27716   3.061866      39.2262     51.32812
```

Figure 1

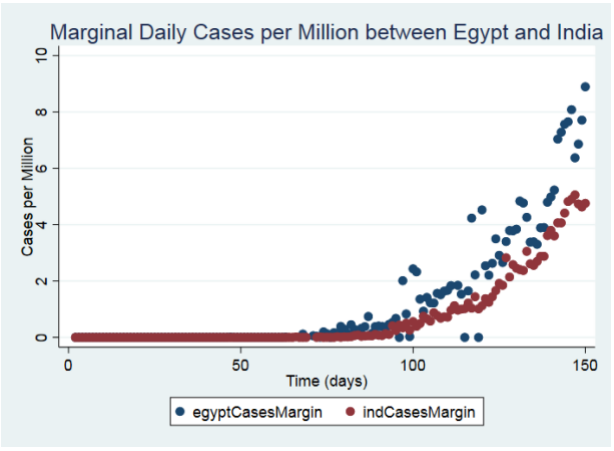

Figure 2

```
. correlate egyptCasesMargin t
(obs=143)

                |  egyptC~n        t
----------------+------------------
egyptCases~n    |   1.0000
              t |   0.7790   1.0000
```

```
. correlate indCasesMargin t
(obs=147)

                |  indCas~n        t
----------------+------------------
indCasesMa~n    |   1.0000
              t |   0.7735   1.0000
```

Figure 3

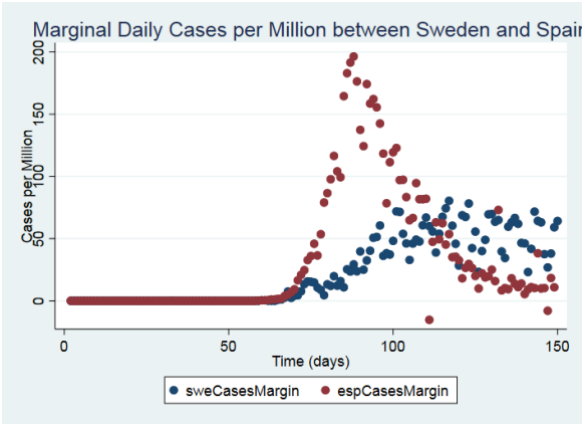

Figure 4

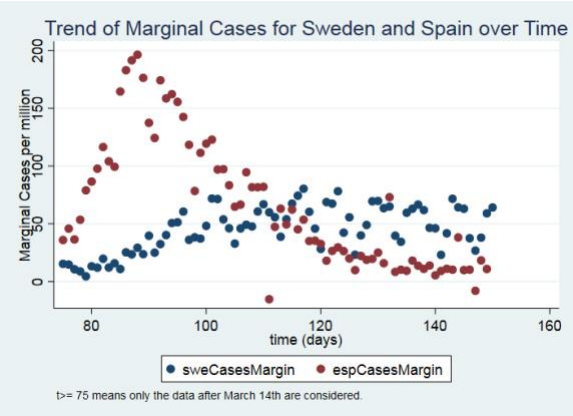

Figure 5

```
. correlate sweCasesMargin t
(obs=149)

                |  sweCas~n        t
----------------+------------------
sweCasesMa~n    |   1.0000
              t |   0.8518   1.0000
```

```
. correlate espCasesMargin t
(obs=148)

                |  espCas~n        t
----------------+------------------
espCasesMa~n    |   1.0000
              t |   0.3529   1.0000
```

Figure 6

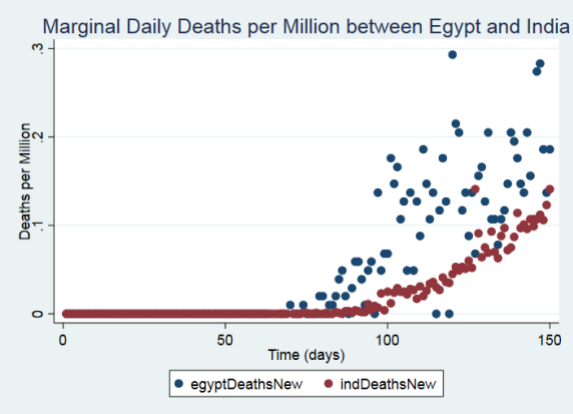

Figure 7

```
. correlate indDeathsNew t
(obs=149)
```

	indDe~ew	t
indDeathsNew	1.0000	
t	0.7904	1.0000

Figure 8

```
. correlate egyptDeathsNew t
(obs=146)
```

	egypt~ew	t
egyptDeat~ew	1.0000	
t	0.8011	1.0000

Figure 9

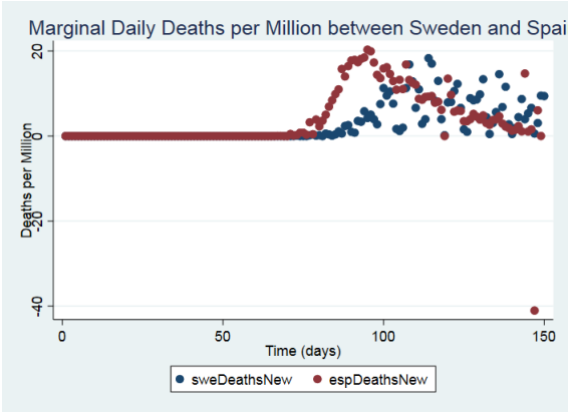

Figure 10

```
. correlate espDeathsNew t
(obs=149)
```

	espDe~ew	t
espDeathsNew	1.0000	
t	0.3513	1.0000

Figure 11

```
. correlate sweDeathsNew t
(obs=150)
```

	sweDe~ew	t
sweDeathsNew	1.0000	
t	0.6480	1.0000

Figure 12

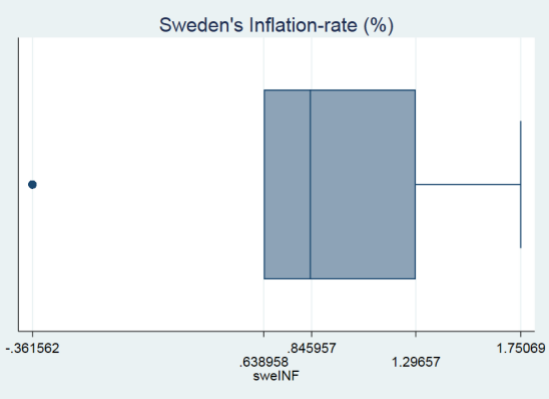

Figure 13

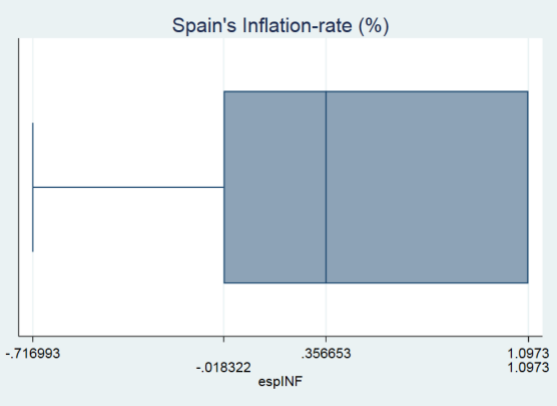

Figure 14

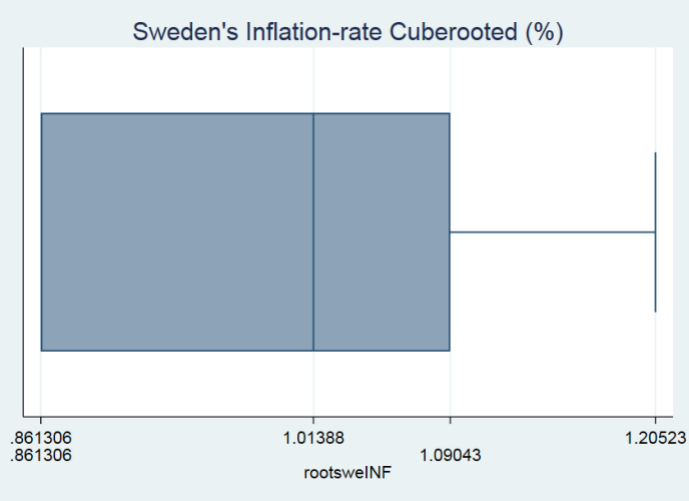

Figure 15

```
. summarize espINF, detail

                          espINF
-------------------------------------------------------------
      Percentiles      Smallest
 1%    -.716993       -.716993
 5%    -.716993       -.716993
10%    -.716993       -.716993       Obs                 122
25%   -.0183224       -.716993       Sum of Wgt.         122

50%    .3566853                      Mean           .2782455
                      Largest        Std. Dev.      .7010084
75%    1.097302       1.097302
90%    1.097302       1.097302       Variance       .4914127
95%    1.097302       1.097302       Skewness      -.2532345
99%    1.097302       1.097302       Kurtosis       1.549932

.
end of do-file
```

Figure 16

```
. summarize sweINF, detail

                          sweINF
-------------------------------------------------------------
      Percentiles      Smallest
 1%   -.3621562      -.3621562
 5%   -.3621562      -.3621562
10%   -.3621562      -.3621562       Obs                 122
25%    .6389584      -.3621562       Sum of Wgt.         122

50%    .8405957                      Mean           .6648528
                      Largest        Std. Dev.      .6385886
75%    1.296567       1.296567
90%    1.296567       1.296567       Variance       .4077954
95%    1.296567       1.296567       Skewness      -.6960937
99%    1.296567       1.750685       Kurtosis       2.018832
```

Figure 17

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