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Analyzing the 2008 Recession

For my project I analyzed the 2008 economy using the Leontief economic model. The Leontief economic model works by dividing a nation's economy into many different sectors. Each sector has an amount of x goods produced, and also an amount of y good required to produce that x good. The matrices used to produce the consumption matrix and the total output vector were given in the forms of the Use Matrix data, and the total industry output vector. Dividing the consumption matrix by the total industry output vector yields the consumption matrix. Adding up each entry across a row in the consumption matrix will get a total amount produced across all of these sectors. With the consumption matrix, an identity matrix of equal size, and the total output across all sectors, it can be determined whether this economy is efficient or not.

I am considering true efficiency to be that the difference between final demand and the amount produced are equal to 0. Every unit being produced is also being consumed. Any number below or above 0 implies inefficiency. In the case that a number is greater than 0 it means that there was a shortage of goods, and in the case that the number was less than 0 there was a surplus of goods, both indicating inefficiency.

The process used was as follows:

1. Divide the Use Matrix data by the total vector output data, yielding the consumption matrix.
2. Adding up each entry across a row in the consumption matrix will yield a (total output per unit) vector.

3. Multiplying this (total output per unit) vector by the difference between the Identity and Consumption matrix will yield a total amount demanded.
4. The difference between this total amount demanded and a total amount supplied will be what determines efficiency.

The results from doing the steps above are shown below.

As is shown, there are barely any 0's in these two charts. Every number that's not a 0 is a positive number, meaning there was a shortage of goods across the nation. There are several numbers very close to 0, but close to 0 does not equal 0.

There could have been possible errors made within this project, for example a misunderstanding of the Leontief model is possible, considering that the leontief model is a simple model to apply, but difficult to understand. There is also a possible argument against how efficiency was defined. Some people might think that either a shortage of goods is efficiency on the part of the consumers, and a surplus is efficiency on the part of the producers. Overall I was looking at the efficiency of the economy, and I consider a perfect trade between producers and consumers to be efficient.

In conclusion the 2008 economy was not efficient, only a couple sectors were perfectly efficient and that might've been because nobody was producing or consuming anything. This makes sense because we were in the largest recession since the great depression during 2008.

0.229719990685546
 0.175511548078200
 1.83988996336196
 0.208927090617380
 0.0314293679823925
 0.451352011144283
 0.227649613911525
 0.167238528339322
 0.120148018771043
 0.872988449463992
 0.479558337556007
 0.203196825172518
 0.295207841090644
 0.115070086548384
 0.204171787909798
 0.0777722969922671
 0.0191715107166128
 0.0336219190691985
 0.166684651600468
 0.129883340913263
 0.0214858923166323
 0.291277528621914
 0.0593056447134820
 0.796620380114920
 1.06457899412074
 0.233032494540173
 0.805168868501252
 0.0829032284460700
 0.0716979955271114
 0.118478007512421
 0.00701422815926998
 0.248256180767903
 0.0167413875235201
 0.0538592896509639
 0.160835731773713
 0.0642456633922295

0.118478007512421
 0.00701422815926998
 0.248256180767903
 0.0167413875235201
 0.0538592896509639
 0.160835731773713
 0.0642456633922295
 0.0586964877665228
 0.0700991399284286
 0.271045565154514
 0.0969841747532897
 0.599142817423326
 0.222535362908829
 0.408095291517691
 0.0119905377117394
 0.634677910690258
 0.351795255344559
 0.204350815440792
 0.159497121801841
 1.27019303682924
 0.490990995413205
 0.610329132151896
 0.0767058438321248
 0.00827199958355079
 0.00225009181233553
 $7.53212346043565 \cdot 10^{-7}$
 0.
 0.0851875311405422
 0.0106623156198543
 0.0726931414624532
 0.137165473836181
 0.229463286344663
 0.
 0.0766422184720735
 0.
 0.0162286746028445

Each of these numbers is the difference

between amount of goods produced and amount of goods consumed in each sector.

Works Cited

Gustafson, Grant. *Linear Algebra Projects Spring 2016*,

www.math.utah.edu/~gustafso/s2017/2270/projects.html.

Lay, David C., et al. *Linear Algebra and Its Applications*. Pearson, 2016.

