

## A Short Empirical Note on State Misery Indexes

**Ryan H. Murphy**

*Southern Methodist University – USA*

**Abstract:** This paper constructs state level Misery Indexes, incorporating recent data on Regional Pricing Parities. As an application, it draws the Phillips curve derived from a panel of fifty states plus the District of Columbia in the years 2008-2011. A state level Misery Index will allow economists and the public to evaluate the overall macroeconomic picture of a regional economy, just as the Misery Index currently allows in the national and international context.

It is now possible to construct Okun's Misery Index (Nessen 2008) at the state level using data published by the BEA (see Aten et al., 2012). This note does so and makes the data available for the period 2008-2011. The Misery Index, defined as the sum of inflation and unemployment rates, offers a method of rapidly summarizing macroeconomic conditions. Both components have been shown to correlate negatively with subjective well-being (Frey and Stutzer, 2002). There is no theoretical reason why it cannot be applied to states as well as to nations. While intuitions regarding macroeconomic policy center on national governments and central banks, policies of local governments may also be pertinent. Numerous recent papers have studied "local multipliers," which in the Keynesian model should reduce unemployment while increasing inflation (e.g., Chodorow-Reich et al. 2012; Nakamura and Steinsson, 2014).<sup>1</sup> In addition, state and local policies which shift the aggregate supply curve and include myriad issues (from labor policy to energy policy) theoretically should have an impact on local inflation rates.<sup>2</sup>

State-level data will allow economists and the public to evaluate whether, for instance, some regions in the country are enjoying a supply-led boom while the rest of the United States languishes in minor stagflation. Disaggregating national data more generally allows broad macroeconomic forces to be interpreted more clearly in the context of the time and place, with state-level panel data as an alternative to the national and international perspectives.

In this note, I find that U.S. states during the Great Recession exhibited heterogeneity not only in their unemployment rates but also in the movements of their price levels. Despite this, the Phillips Curve relation is weak in the panel of states, although it is present and statistically significant. The highest values for the Misery Index predominantly appear in 2009, during which inflation resumed (as defined here) but unemployment rates remained high.

The Bureau of Economic Analysis now publishes "Regional Price Parities" (RPPs). These can be used to estimate cost-of-living adjusted incomes by state, in the same sense that Purchasing Power Parity allows accurate comparisons across countries.<sup>3</sup> These

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<sup>1</sup> These are not to be confused with "local multipliers" dependent on the effects of agglomeration, not aggregate demand (e.g., Moretti, 2010). Presumably these local multipliers would also impact at least the unemployment component of the Misery Index, however.

<sup>2</sup> The interpretation of the aggregated "general equilibrium" effects of such policies are often ignored but are policy relevant.

Central banks credibly targeting inflation presumably respond to policies so as to hit their target in the aggregate, meaning that inflation locally may directly lead to disinflation elsewhere within a currency area (Murphy, 2015).

<sup>3</sup> Note that this is for all fifty states and the District of Columbia. Regional CPI, which is available at the Bureau of Labor Statistics,

interstate comparisons, however, can also be used in conjunction with national data on inflation rates to construct within-state inflation. This, added to the regional Bureau of Labor Statistics data on state unemployment rates, yields the State Misery Index.

BEA also publishes an “Implicit Regional Price Deflator” which may be interpreted as a price index. But the point here is to construct what is analogous to CPI, so instead national Chain-Weighted CPI was used as the baseline, with Regional Price Parities measuring movements around this baseline. Formally, where  $CPI_t$  is the national CPI index value in year  $t$  and  $RPP_{t,i}$  is the Regional Price Parity in year  $t$  and state  $i$ , the State Misery Index is mathematically defined as,<sup>4</sup>

$$\text{State Misery Index}_{t,i} = \left( \frac{CPI_t}{CPI_{t-1}} \frac{RPP_{t,i}}{RPP_{t-1,i}} - 1 \right) + \text{unemployment rate}_{t,i} \quad (1)$$

Descriptive statistics for the state inflation rates (the combined CPI and RPP), the state unemployment rates, and the State Misery Indexes can be found in Table 1. Following this, rankings for the U.S. states in 2011 are found in Table 2. Finally, a full listing of the four years of Misery Index data is provided in Table 3.

One small extension to this exercise is to graph the two components of the misery index against one another, i.e., the Phillips Curve.<sup>5</sup> This relationship is shown in Figure 1. A simple regression finds a negative coefficient, with one percentage point higher inflation corresponding to 0.45 fewer percentage points in unemployment. However, this regression only explains (unadjusted  $R^2$ ) 8.6% of the variation in unemployment across states and across time. While this crude test hardly captures all the nuances of aggregate demand, it suggests that both supply-side and demand-side policies were important in explaining differences in unemployment rates even during the Great Recession.

While the Misery Index may be seen as a simple piece of rhetoric or a questionably weighted construct (e.g., equally weighting inflation and unemployment may be incorrect; see di Tella et al., 2001), it offers a frugal method of evaluating the character of the macroeconomy. Moreover, while no U.S. state during the

Great Recession approached the Misery Index values of European countries like Spain or Greece, there are certain analogues between states in the U.S. and countries in the Euro Area. As such, Misery Indexes by state add to the discussion as to whether the United States is an optimal currency area. It may also be of use in measuring the “macroeconomic” effects of state economic development programs, explaining net in-migration across states (as in Cebula, 2014; Cebula and Alexander, 2006; c.f. Mulholland and Hernandez-Julian, 2013), or how it may interact with economic freedom or subjective well-being more generally (Belasen and Hafer, 2013). While the Misery Index may most often be cited by wonks and journalists, state level data may still contribute to the scholarly discussion of state policy.

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**Table 1.** Descriptive statistics.

	mean	st.dev.	min	max
Inflation Rate	1.7	1.3	-2.1	5.0
Unemployment Rate	8.1	2.0	3.1	13.9
Misery Index	9.7	2.1	4.0	15.2

Note:  $n=204$ .

is for more general geographic regions of the United States as well as a select group of Metropolitan Statistical Areas.

<sup>4</sup> In practice, for the year 2008, for example, the inflation rate is taken to be the percent change in CPI from January 2008 to January 2009, while the RPP data is annual. The unemployment rate is that of December 2008.

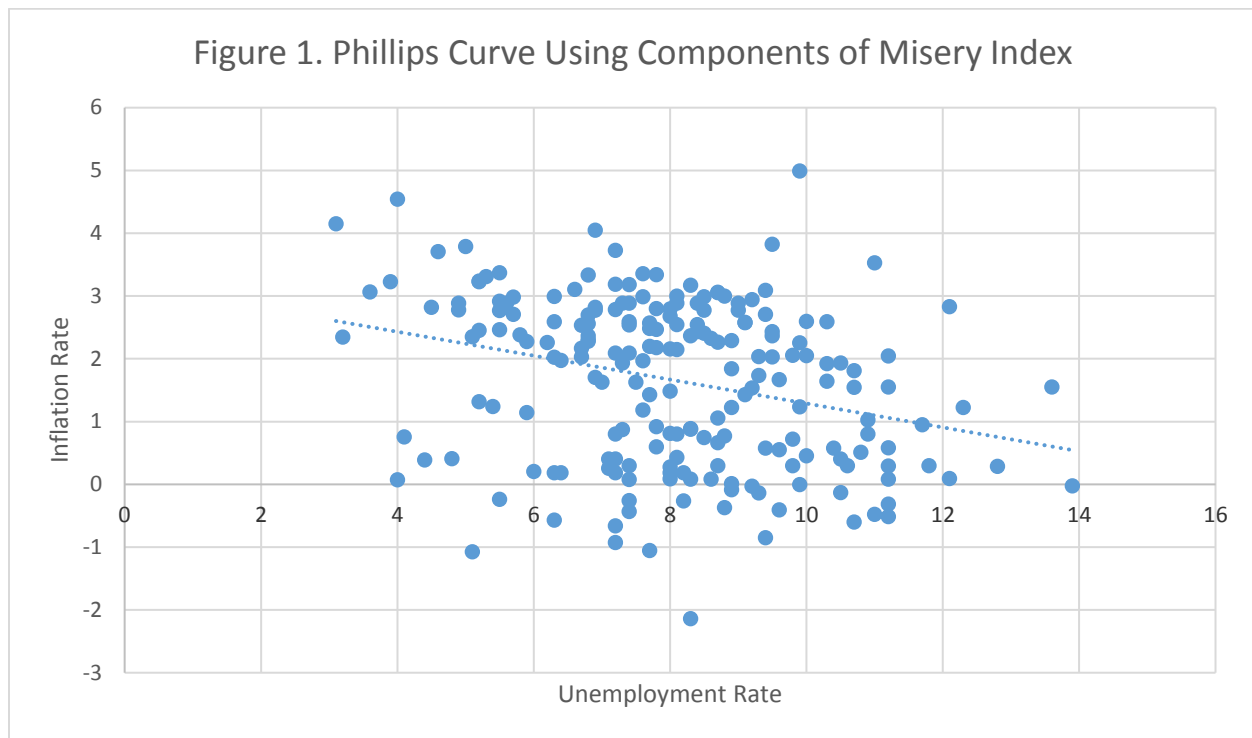
<sup>5</sup> More sophisticated tests of the Phillips Curve at the state level using nominal wage data have been performed elsewhere. See, for example, Kumar and Orrenius (2014).

**Table 2.** States ranked by Misery Index, 2011.

	Inflation	Unemployment	Misery	Rank
Nebraska	3.2	3.9	7.1	1
North Dakota	4.2	3.1	7.3	2
Wyoming	2.4	5.1	7.5	3
Utah	2.8	4.9	7.7	4
Iowa	2.9	4.9	7.8	5
Kansas	2.8	5.5	8.3	6
Vermont	3.7	4.6	8.3	7
Oklahoma	3.2	5.2	8.4	8
Hawaii	3.2	5.2	8.4	9
Montana	2.9	5.6	8.5	10
South Dakota	4.5	4	8.5	11
Minnesota	3.3	5.3	8.6	12
Virginia	3.0	5.7	8.7	13
Massachusetts	2.0	6.7	8.7	14
New Hampshire	3.4	5.5	8.9	15
Missouri	2.5	6.7	9.2	16
Texas	3.0	6.3	9.3	17
New Mexico	2.6	6.8	9.4	18
Maryland	2.7	6.8	9.5	19
Wisconsin	2.8	6.9	9.7	20
Idaho	3.1	6.6	9.7	21
Ohio	2.5	7.4	9.9	22
Delaware	2.8	7.2	10.0	23
Louisiana	3.3	6.8	10.1	24
West Virginia	2.9	7.3	10.2	25
Florida	2.5	7.8	10.3	26
Arizona	2.6	7.7	10.3	27
Arkansas	2.9	7.4	10.3	28
Colorado	3.2	7.2	10.4	29
Washington	3.2	7.4	10.6	30
Pennsylvania	3.0	7.6	10.6	31
New York	2.8	8	10.8	32
Indiana	2.4	8.4	10.8	33
Maine	3.7	7.2	10.9	34
Alaska	4.1	6.9	11.0	35
Alabama	3.4	7.6	11.0	36
Connecticut	2.9	8.1	11.0	37
Kentucky	3.0	8.1	11.1	38
Tennessee	3.3	7.8	11.1	39
Mississippi	2.3	8.9	11.2	40
Georgia	2.8	8.5	11.3	41
South Carolina	2.9	8.4	11.3	42
Oregon	3.0	8.5	11.5	43
Illinois	2.6	9.1	11.7	44
DC	3.1	8.7	11.8	45
Michigan	2.8	9	11.8	46
North Carolina	3.0	8.8	11.8	47
Rhode Island	2.1	9.8	11.9	48
New Jersey	2.9	9	11.9	49
California	2.4	9.5	11.9	50
Nevada	1.6	10.3	11.9	51

**Table 3.** State Misery Index data.

	2008	2009	2010	2011	2008-11 Average
US Average	7.49	12.2	10.7	10.3	10.22
Alabama	12.1	12.8	6.16	10.9	10.53
Alaska	8.28	8.72	10.0	10.9	9.49
Arizona	10.6	11.1	10.1	10.2	10.56
Arkansas	7.94	11.4	6.65	10.2	9.09
California	12.2	14.9	14.5	11.9	13.40
Colorado	9.19	10.9	10.6	10.3	10.30
Connecticut	8.82	10.7	9.18	10.9	9.93
Delaware	9.37	9.49	7.36	9.99	9.05
District of Columbia	10.4	13.3	14.8	11.7	12.61
Florida	10.8	12.2	10.7	10.2	11.04
Georgia	10.3	12.4	9.19	11.2	10.82
Hawaii	6.27	9.17	9.11	8.44	8.25
Idaho	9.17	9.76	9.90	9.71	9.63
Illinois	11.7	11.8	11.0	11.6	11.59
Indiana	11.3	11.3	9.57	10.8	10.76
Iowa	6.59	8.41	6.52	7.79	7.33
Kansas	7.61	9.72	6.21	8.27	7.95
Kentucky	10.9	12.1	9.00	11.1	10.79
Louisiana	7.48	10.6	6.97	10.1	8.81
Maine	8.39	8.90	10.1	10.9	9.60
Maryland	8.79	9.49	8.61	9.50	9.10
Massachusetts	8.43	9.98	9.08	8.73	9.06
Michigan	13.8	13.2	9.98	11.7	12.22
Minnesota	8.40	8.63	8.18	8.61	8.46
Mississippi	10.1	12.6	8.55	11.1	10.61
Missouri	10.1	12.1	7.70	9.24	9.80
Montana	6.54	9.23	8.37	8.49	8.16
Nebraska	5.21	7.32	4.86	7.13	6.13
Nevada	13.0	15.1	13.5	11.9	13.43
New Hampshire	5.74	7.97	6.64	8.87	7.30
New Jersey	10.5	12.4	10.5	11.8	11.36
New Mexico	8.19	10.6	9.57	9.36	9.43
New York	8.91	10.9	10.9	10.8	10.39
North Carolina	11.5	12.2	10.1	11.8	11.42
North Dakota	4.07	6.67	5.55	7.25	5.89
Ohio	10.5	12.1	8.09	9.94	10.17
Oklahoma	7.51	8.89	5.26	8.43	7.52
Oregon	11.7	12.0	11.6	11.4	11.73
Pennsylvania	8.69	10.6	9.13	10.5	9.77
Rhode Island	11.2	12.7	11.9	11.8	11.96
South Carolina	12.6	12.5	9.90	11.2	11.59
South Dakota	4.03	8.79	4.79	8.55	6.54
Tennessee	10.9	11.5	8.53	11.1	10.53
Texas	8.38	10.1	8.01	9.29	8.96
Utah	8.81	9.13	8.18	7.68	8.45
Vermont	6.49	7.04	7.66	8.31	7.37
Virginia	8.17	8.87	8.33	8.69	8.51
Washington	10.9	11.2	10.9	10.5	10.94
West Virginia	9.25	11.7	7.14	10.1	9.58
Wisconsin	9.17	10.2	9.29	9.68	9.60
Wyoming	7.39	8.46	8.42	7.46	7.93



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