THE LIVING WAGE: TRENDS AND OBSERVATIONS

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FOREWORD

This dissertation was done under the supervision of Professor Joshua Laurito at the School of Professional Studies in the faculty of Information Systems.

ABSTRACT

Quote definition of living wage from http://livingwage.mit.edu/resources/Living-User-Guide-and-Technical-Notes-2014.pdf. Why is it useful definition

   Original model produced data for 2014. Purpose of this paper is to take this model and use it to investigate trends in the living wage for the years 2004 - 2014.

   Note about definition of household

   List preliminary results

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NOMENCLATURE

1.1 SYMBOLS AND GREEK

q'	Heat Flux
Q_{rad}	Radiation Heat Flux
R	Reaction Rate
A	Area [m^2]
f_{st}	stoichiometric fuel air ratio
ϕ	fuel-air ratio
σ	Stefan-Boltzmann constant (5.670373e-8m2K4)
T_{meas}	Measured Temperature
χ	Molar Concentration
X_i	Molar fration of species i
$\dot{m}$	mass flow rate [g/s]
ϵ	Turbulent energy dissipation rate
ϵ	Emissivity
k	Turbulent energy production rate
ρ	Density
τ	Residence Time
τ	Stress tensor
ν	Kinematic Viscosity
C_μ	Turbulent Viscosity
S_L	Flame velosity
σ_L	Flame length
K_v	Recirculation Ratio
v_{rms}	Characteristic velocity

CFD	Computational Fluid Dynamics
CRN	Chemical Reactor Network
DLE	Dry Low Emissions
LBO	Lean Blowout
LPP	Lean Premixed Prevaporized
FLOX	Flameless Oxidation
NO_x	Oxides of Nitrogen
CO	Carbon Monoxide
OH	Hydroxyl Radicals
UHC	Unburned Hydrocarbons
FC	Flameless Combustion
EPA	Environmental Protection Agency
RQL	Rich Burn Quick quench Lean Burn Combustor
DNS	Direct Numerical Simulation
RANS	Reynolds Averaged Navier Stokes
LES	Large Eddy Simulation

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INTRODUCTION

2.1 BACKGROUND

2.1.1 *Definition of the Living Wage*

Quote definition of living wage from http://livingwage.mit.edu/resources/Living-User-Guide-and-Technical-Notes-2014.pdf

2.1.2 *Definition of the Living Wage Model*

Show model equation
Show model variables in table, with name, purpose, granularity, data source

2.1.3 *Definition of the Living Wage Gap*

2.1.4 *Purpose of Project*

Extend this model for 2004 - 2014, determine if there are any trends in distribution of the living wage, as well as any trends based on race.

DATA SOURCES AND COLLECTION

This section will describe the data collection process. All data files mentioned here are available in the github repository, under the data/ directory. Each data source is typically loaded into a Pandas DataFrame, which can be seen in the code sections linked to in the Appendix, or via the associated IPython notebook.

3.1 CONSUMER EXPENDITURE REPORT

What is the CEX report, what its used for, link to code section in appendix

3.2 USDA FOOD PLANS

What is USDA Food Plan, what its used for, link to code section in appendix

3.3 FREE MARKET RENT DATA FROM HUD

What is free market rent, what is hud, what its used for, link to code section in appendix

3.4 MEDICAL EXPENDITURE PANEL SURVEY FROM THE AHRQ

What is MEPS, what is AHRQ, what its used for, link to code section in appendix

3.5 TAX DATA

3.5.1 *State Tax Data*

link to code section

3.5.2 *Federal Tax Data*

link to code section

MODEL VARIABLES

This section will describe each model variable, and link to a section of code in the appendix describing how its loaded.

4.1 HOUSING COSTS

Most Populous Counties

4.2 FOOD COSTS

What is USDA Food Plan, what its used for, link to code section in appendix

4.3 CHILD CARE COST

Currently, we are only looking at households that contain a single adult. Therefore, we do not model the costs of raising a child. One reason why this was done is that the data source for Child Care only goes back to 2006. Expanding on this work would find data for 2004 and 2005, and model the living wage for different family configurations.

4.4 TRANSPORTATION COSTS

4.5 HEALTH CARE COSTS

4.6 OTHER COSTS

4.7 TAXES

4.7.1 *Payroll taxes*

4.7.2 *State Taxes*

4.7.3 *Federal Income Tax Rate*

4.8 FINAL DATAFRAME

The final data frame, that includes each individual model variable as well as the total living wage $'total_cost'$, with a row for each county per year, is created in section bleh. This DataFrame is used by the following sections of analysis.

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INTRODUCTORY ANALYSIS

This section will start to look at the living wage data to look for trends. First, we'll look into a few individual counties, and then look at state and regional averages. Secondly, we'll develop a set of maps of counties and their associated living wage. Finally, we'll look at the living wage distribution by population and by race.

5.1 LIVING WAGE IN INDIVIDUAL COUNTIES

5.2 STATE AVERAGES OF THE LIVING WAGE

5.3 CHOROPLETH OF COUNTIES: 2004, 2006, 2014

5.4 REGIONAL AVERAGES OF THE LIVING WAGE

5.5 NATIONAL AVERAGE BREAKDOWN ACROSS 2004 - 2014

5.6 LIVING WAGE DISTRIBUTION IN MOST POPULOUS COUNTIES

5.7 LIVING WAGE DISTRIBUTION BY RACE

5.7.1 *Loading Race Data from 2010 Census*

Move to data collection section

5.7.2 *Living Wage County (Non-Weighted) Breakdown by Race*

5.7.3 *Living Wage County (Weighted) Breakdown by Race*

5.7.4 *Population Weighted Averages Broken Down By Race*

LIVING WAGE GAP

This section will start to look at the living wage gap. First, we will come up with two definitions for the living wage gap, one based on the median wage, and one defined by the minimum wage. After that, we will look at distributions of both definitions. Finally, we will look at the distribution of households who earn the living wage or below.

6.1 DATA COLLECTION

Move this to data collection section

6.1.1 *SAIPE - Small Area Income and Poverty Estimates*

6.1.2 *Minimum Wage Data*

6.2 DISTRIBUTION OF THE MEDIAN-GAP

6.3 DISTRIBUTION OF THE MINIMUM-WAGE-GAP

6.4 PERCENTAGE OF SINGLE HOUSEHOLDS AT OR BELOW THE LIVING WAGE

Note that data is broken down into buckets, so numbers are an approx. Note the household definition again

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RESULTS AND FUTURE WORK

7.1 OVERALL RESULTS

- The living wage seems to have leveled off in last few years. Not sure why, but future analysis would be interesting

- Gap between minimum wage and the living wage reached a peak, and then some gains were made due to increases in the minimum wage. However, due to rent and inflation, current levels are close to the peak again.

- The top 150 most populous counties have a much higher living wage than the rest of the country. This is mostly due to rent

- The top 150 most populous counties can be split into two groups.

- White and blacks seem to have similar living wage distributions, as they are relatively well mixed across the county. Other races, especially asians and PI, are concentrated into areas with high living wages.

- Races seem to experience the same increases over time, with their distributions being controlled by population dyamics (since the living wage changes most with location)

- When looking at **only** single households, we see that on average, 50

- Median wage?

7.2 FUTURE WORK

- If we could get wages broken down by race **and** by county, this would allow us to see how the living wage gap have evolved over time between races.

"

Part I

Appendix

CODE LISTINGS

```python
def hello(name):
    print 'Hello', name

if __name__=='__main__':
    hello('Me')
```

Thinking each code section could just link to the notebook using the anchor tag