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# Do the Highly Skilled Rich Pay State Income Taxes: State Tax Incidence using Major League Baseball Data

Joshua R. Coulter

Research Advisor: Dr. Sarah M. Estelle  
Senior Research Project in Economics



## Abstract

This research studies the responsiveness of the rich to state income taxes. Interstate migration is worrisome to policy makers because talent may move, in effect voting for lower income taxes with their feet. Furthermore, businesses may choose to locate elsewhere if they bear the burden of the tax or if they cannot attract skilled labor. To test whether employers or highly productive employees bear the burden of the state income tax and to what extent, I use Major League Baseball Data (MLB) from 1992-2012 of all free agent transactions. MLB data is useful in this analysis because it provides both performance and salary data, which is nearly impossible to observe in other highly skilled markets. I will use team and year fixed effects to find the effect of taxes on take home pay. This will help control for other factors in a free agent's decision-making processes such as team and city characteristics.

## Introduction

- People have the choice to move freely amongst states, does the income tax rate matter in the decision making process?
- Studies looking at rich responsiveness to income taxes have trouble controlling for exogenous factors Young and Varner (2011) Bakija and Slemrod (2004)
- Researchers often look to baseball and sports labor markets to study economic problems because salaries are public and performance is observable
- Ross and Dunn (2007) and Alm, Kaempfer, and Sennoga (2012) look at the relationship between baseball contracts and state income tax but are restricted by sample size

## Theory

- Baseball free agency is an open market for players with expired contracts
- Labor demand is fixed because teams cannot have more than 25 players– having less than 25 does not happen
- Laborers bear little to none of the tax because of the inelastic demand curve

## Data

- Combine 3 datasets for baseball statistics- Retrosheet, Lahman Baseball Database, and Baseball Reference WAR Database
- Use the NBER's state income tax data, Zillow for median house price by Major League City

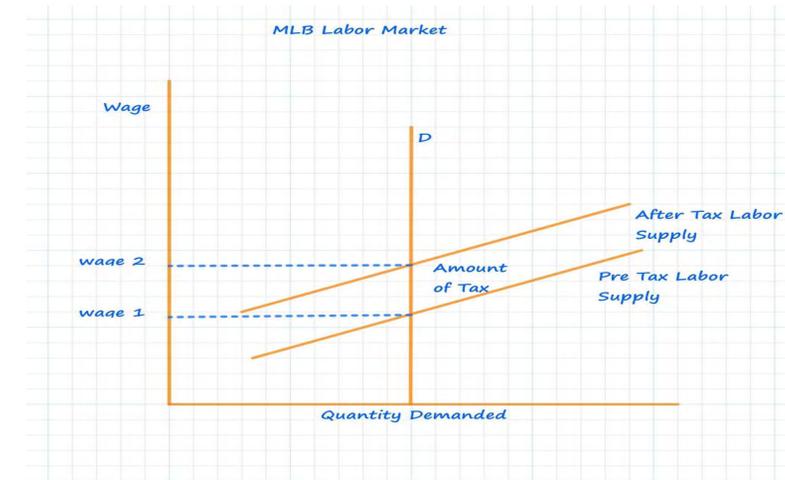
Variable	Obs	Mean	Std. Dev.	Min	Max
Salary	4519	2999608	3506034	0	2.59E+07
Tax Rate	5921	5.521189	1.610241	2.595741	9.072411
War in Contract Year	6038	0.3723087	1.235249	-2.75	10.35
War Previous 3 Years	6043	0.7472525	1.148371	-1.276667	8.813334
Median House Price	5657	199530.1	291077.4	0	5654645
Attendance	6074	2427840	729631.1	642745	4483350
Pitcher Flag	6043	0.4709581	0.4991972	0	1
AL Flag	6136	0.4476858	0.4972962	0	1

## Empirical Plan

- Do incomes change? Measure if player nominal salary increases when state tax rate increase by controlling for player performance, a team vector, and a city vector
- Year fixed and city fixed effects are incorporated into some models but may have limitations

## Limitations

- Unable to find local income tax data
- Unobservable contract characteristics such as number of years, no trade clauses, player or team options
- Unobservable player preferences such as hometown, weather etc.
- Unobservable team preferences



## Results

### Salary Results

taxrate	-56593.3* (26703.2)	-4801.1 (26643.5)	-788414.1** (133011.6)	-212321.7 (167754.2)	-103162.2** (38205.9)	-1965.2 (38731.1)	-465779.7** (154362.4)	-337775.1 (186519.3)
War in Contract Year	236571.5*** (34576.0)	268122.4*** (33693.4)	235621.8*** (34717.3)	255785.7*** (33938.5)	278848.5*** (37424.5)	309699.6*** (36854.5)	288409.2*** (37393.9)	296471.3*** (37185.3)
War previous 3 years	1721742.3** (39054.3)	1711160.0** (37979.0)	1715750.0** (39058.7)	1705772.4** (38165.0)	1691354.8** (42166.3)	1683625.1** (41434.4)	1687391.7** (41936.2)	1679732.2** (41716.2)
Pitcher Dummy	292779.8** (83369.9)	285493.2*** (81043.8)	285984.8*** (83228.7)	292076.2*** (81206.0)	283584.9** (89713.9)	280343.9** (88009.1)	280322.4** (88884.4)	285721.5** (88158.1)
AL Dummy	-248412.3** (83896.9)	-146605.2 (81751.4)	-257035.1** (85686.0)	-178074.6* (83674.1)	-150610.2 (90372.7)	-96428.5 (88725.9)	-150052.4 (91653.7)	-132549.1 (90815.6)
Median House Price	0.993*** (0.145)	0.105 (0.155)	0.748*** (0.162)	-0.0336 (0.170)	3.930*** (0.357)	0.622 (0.469)	6.237*** (0.531)	1.675 (0.892)
Attendance	0.378*** (0.0586)	0.216*** (0.0606)	0.396*** (0.0783)	0.284*** (0.0812)	0.160* (0.0679)	0.217** (0.0690)	0.0396 (0.0873)	0.171 (0.0916)
_cons	364685.1 (204883.1)	-374052.9 (288615.8)	2299670.4** (746826.9)	396085.4 (823255.4)	634372.7* (271598.5)	-476697.3 (359392.2)	2796731.3** (797844.3)	1468260.0 (937839.1)
N	4080	4080	4080	4080	3341	3341	3341	3341
Year Fixed Effect?	No	Yes	No	Yes	No	Yes	No	Yes
Team Fixed Effect?	No	No	Yes	Yes	No	No	Yes	Yes
Outliers?	Yes	Yes	Yes	Yes	No	No	No	No

Standard errors in parentheses  
=\*\* p<0.05    \*\* p<0.01    \*\*\* p<0.001"

- Wins above replacement (WAR), a performance metric, is the best predictor of salary for a player
- Pitchers are paid more, on average, than hitters on average
- Players take median house price and attendance play a role in negotiations
- The role of tax rates could not be determined, the standard errors are too large
- Team fixed effects does not provide a reliable estimate of the role of taxation because tax rates do not change from state to state overtime
- Player migration based on tax rate yield similar inconclusive results.

## Conclusions

- Players and teams find negotiate contracts based on a variety of external and internal factors
- Player performance, above all is the largest determinate in salaries
- Unobservable characteristics and data limitations lead to large standard errors and mitigate the ability to find causality of tax rates on salary and talent migration

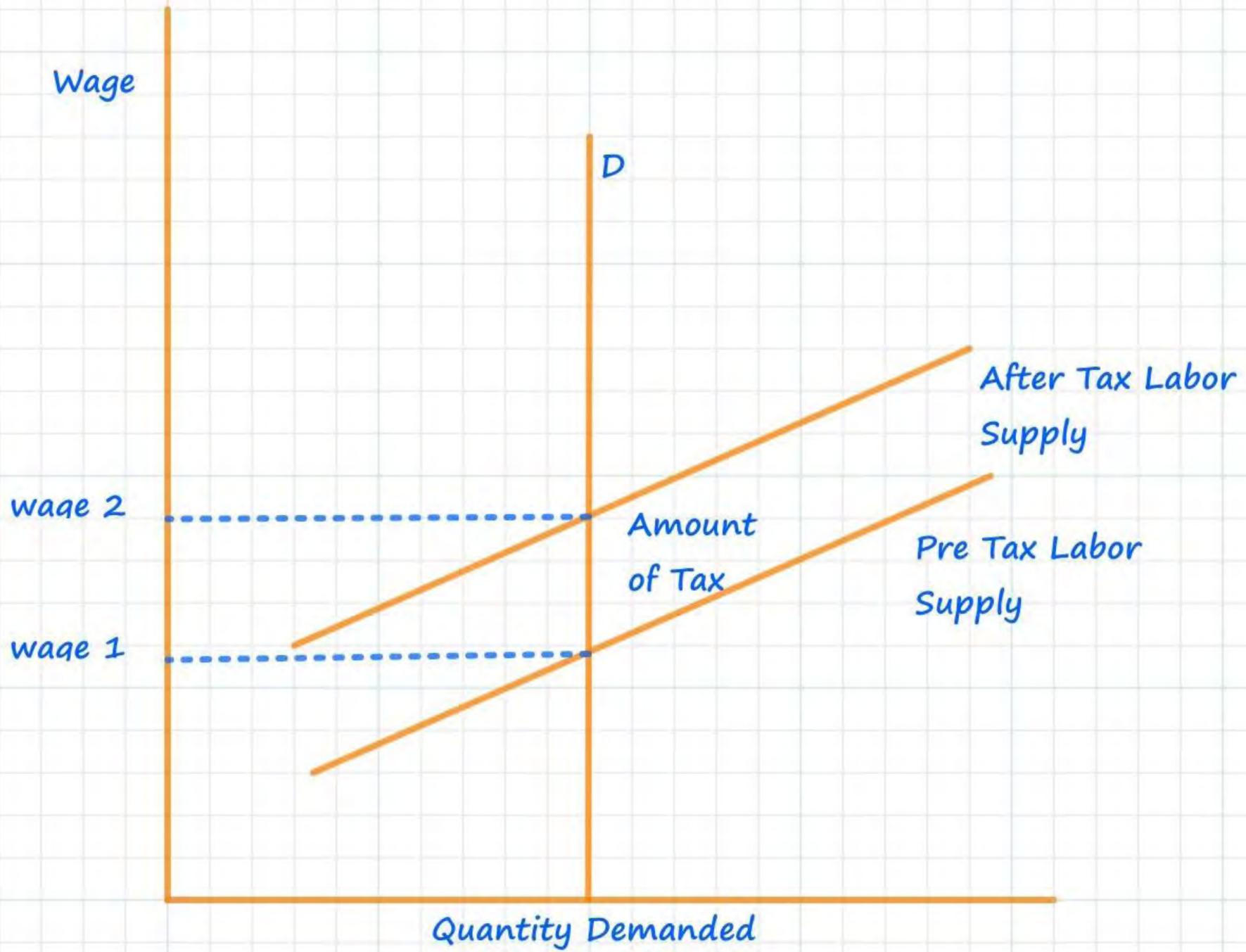
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# MLB Labor Market



# Data

- Combine 3 datasets for baseball statistics- Retrosheet, Lahman Baseball Database, and Baseball Reference WAR Database
  - Wins Above Replacement: wins supplied by a players statistics above the best minor league player at that position
- Use the NBER's state income tax data
- Use Zillow's median house price by Major League City
- Over 4000 free agent transactions from 1992-2012

Variable	Obs	Mean	Std. Dev.	Min	Max
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# Empirical Plan

- Do incomes change? Measure if player nominal salary increases when state tax rate increase by controlling for player performance, a team vector, and a city vector
- Do players migrate? Average of player performance over the 3 years after the contact year controlling for nominal salary, team and city effects
- Year fixed and city fixed effects are incorporated into some models but may have limitations

# Limitations

- Unable to find local income tax data
- Unobservable contract characteristics such as number of years, no trade clauses, player or team options
- Unobservable player preferences such as hometown, weather etc.
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# Salary Results

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