

# MONTANA: ECONOMIC FUTURE WITH EDUCATIONAL REFORM

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This file contains detailed projections and information from the article:

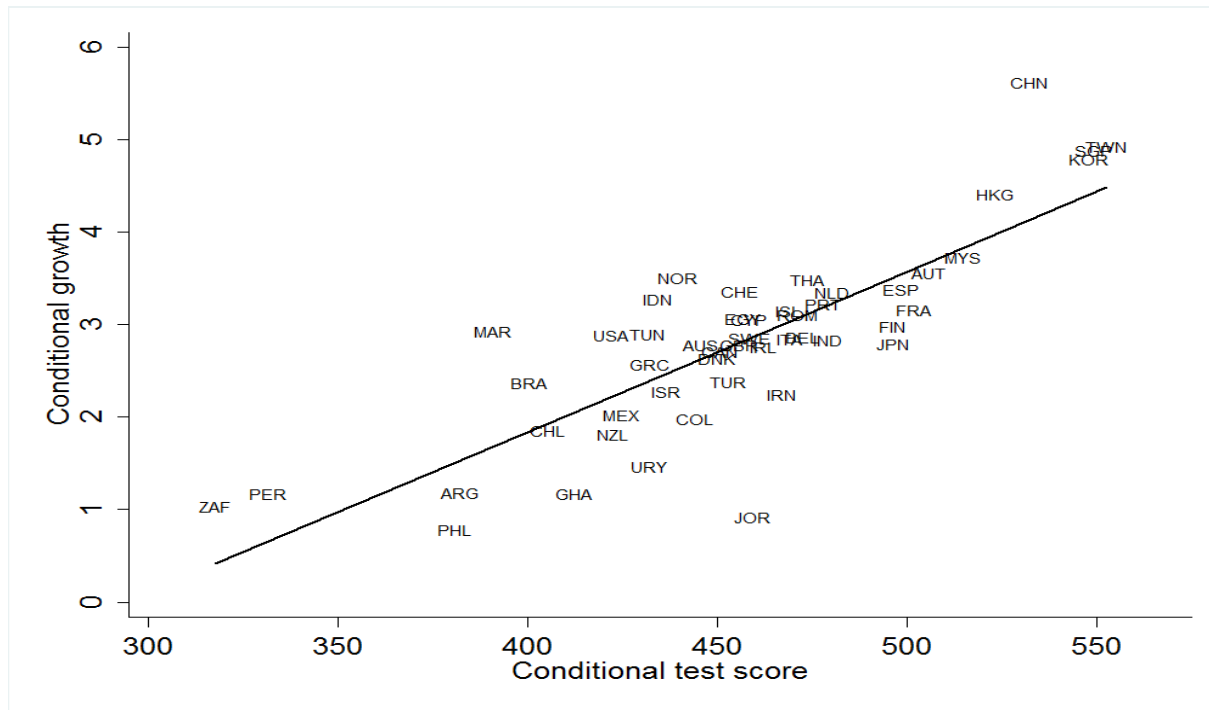
Eric A. Hanushek, Jens Ruhose, and Ludger Woessmann, “It pays to improve school quality: States that boost student achievement could reap large economic gains,” *Education Next*, Summer 2016

<http://educationnext.org/pays-improve-school-quality-student-achievement-economic-gain/>

# U.S. and State Interests

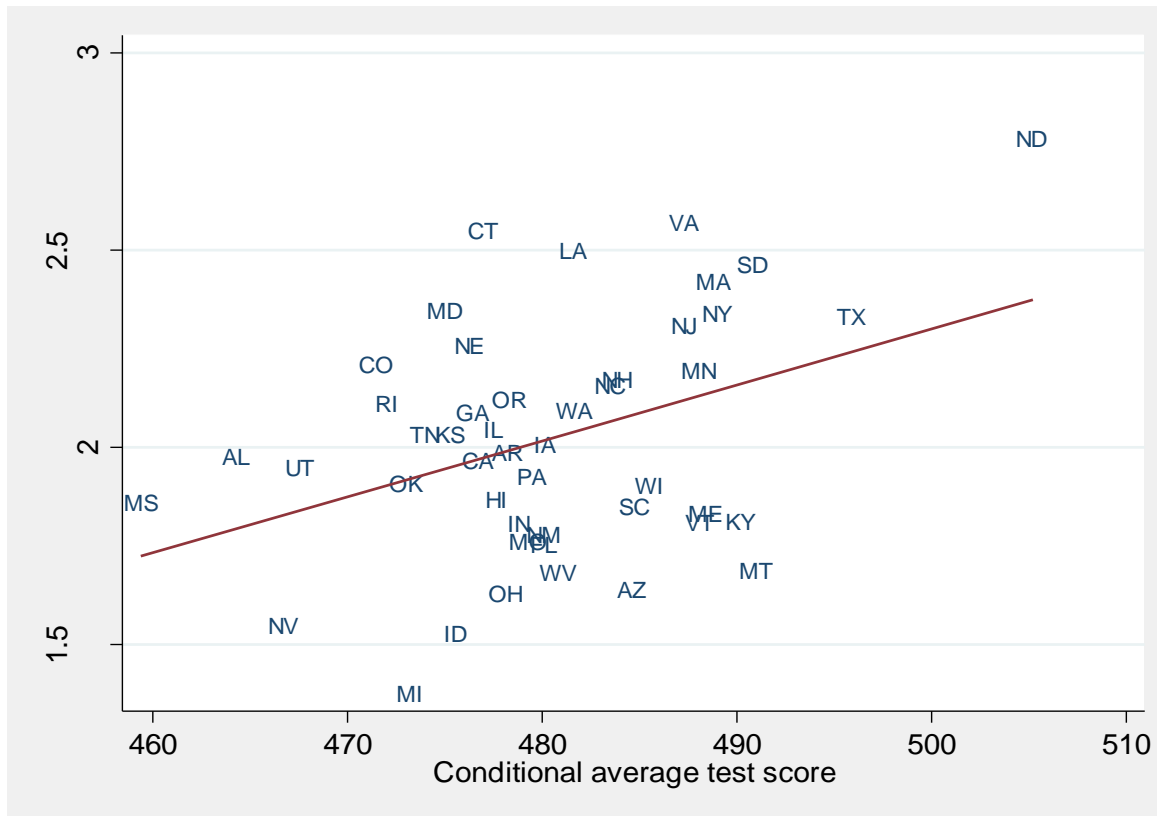
- Future depends on skills of the population
- True for the nation *and* for individual states
- Improvements in student achievement return very large economic returns to states
  - Feasible gains would provide more incomes to state than total spending on K-12 education

# Cognitive Skills and Long Run Economic Growth: International Evidence



Growth in GDP/pop over 1960-2000 as related to math and science skills and conditional on income levels in 1960

# Test Scores and Growth: U.S. states



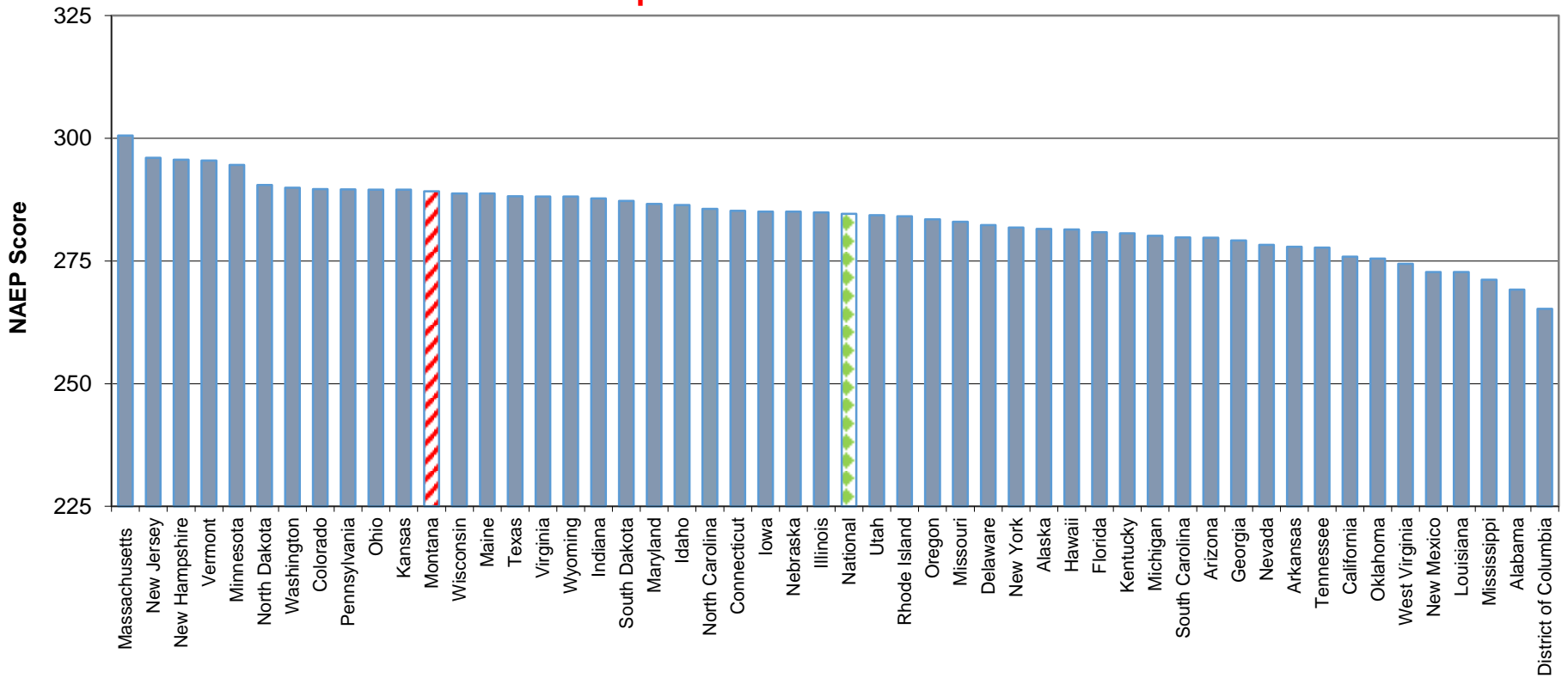
Growth in GDP/pop over 1970-2010 for states as related to math skills and conditional on income levels in 1970

# Montana's Position in the U.S.

- The economic performance of states is dependent upon the skills of their populations.
- States compete with each other in terms of the skills of their population.
- National Assessment of Educational Progress (NAEP) for 2013 tracks current schools

# NAEP 8th Grade Mathematics, 2013

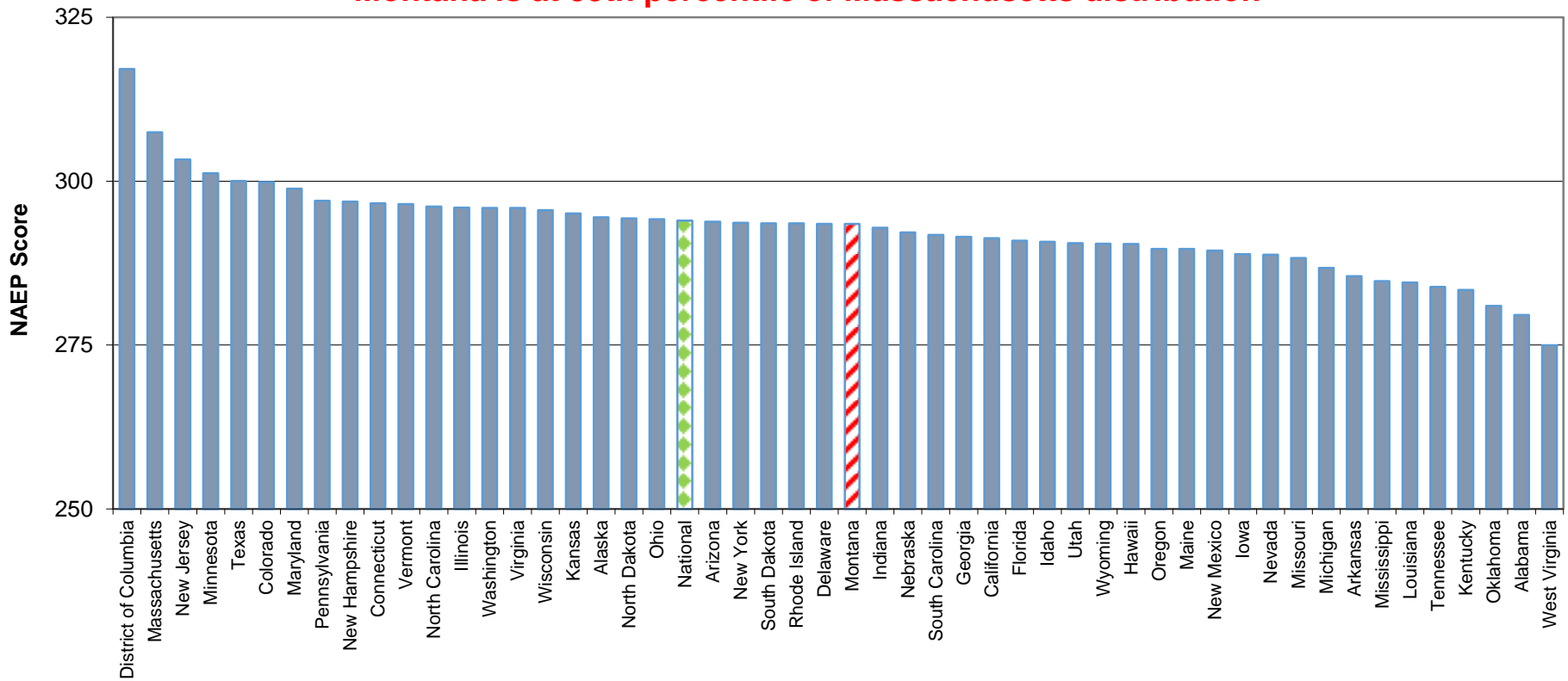
**Montana is at 55th percentile of U.S. distribution**  
**Montana is at 38th percentile of Massachusetts distribution**



# NAEP 8th Grade Mathematics, White Students, 2013

Montana is at 49th percentile of U.S. distribution

Montana is at 35th percentile of Massachusetts distribution



# Projection Methodology

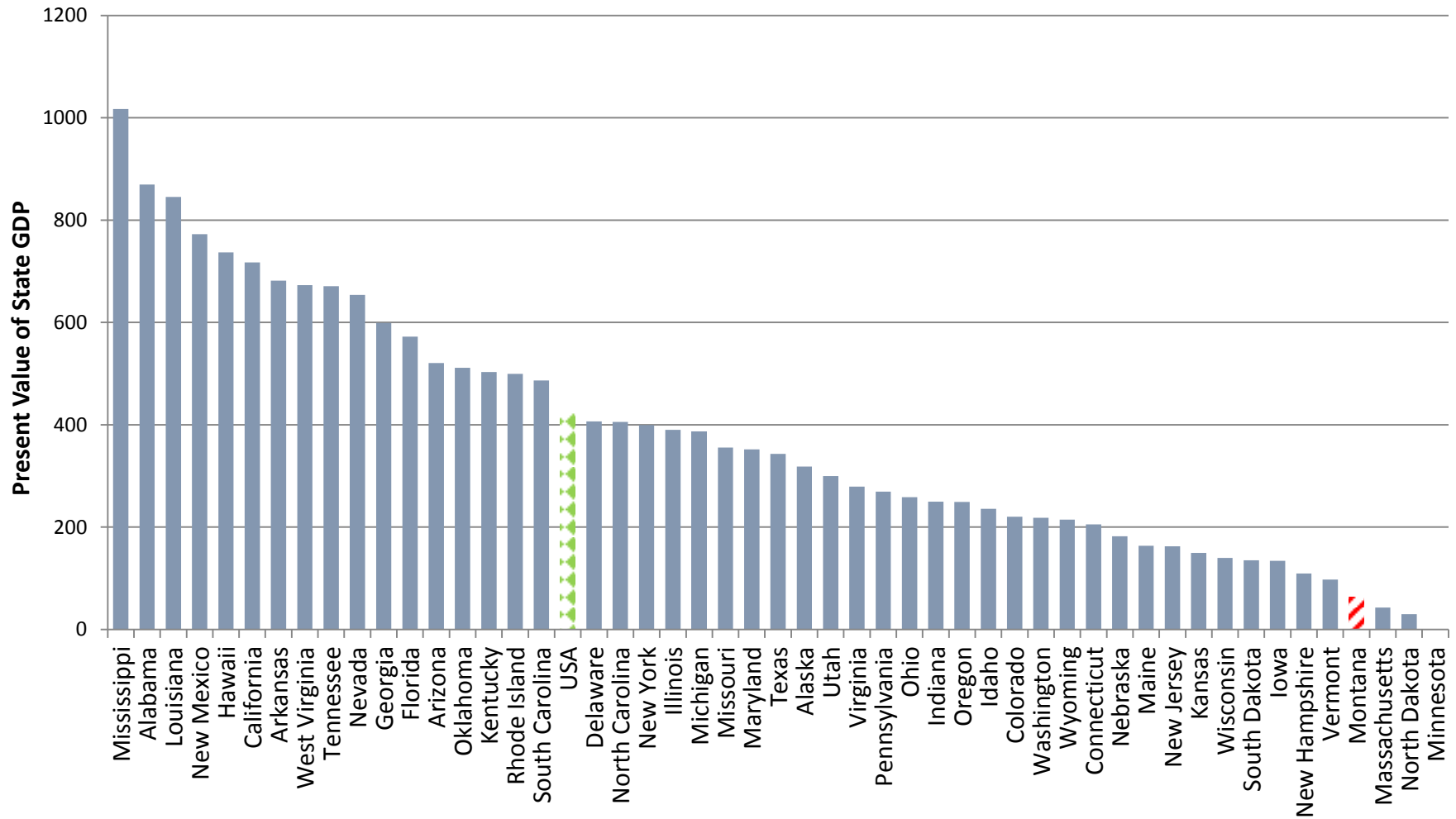
- Educational improvements steady until reaching the post-2015 goals in 2030
- Work life of 40 years
- Growth rate is based on the average skill of workers
- Consider horizon of somebody born today (80 years)
- Future gains in GDP are discounted to the present with a 3% discount rate
  - Implies the projections are directly comparable to current levels of GDP



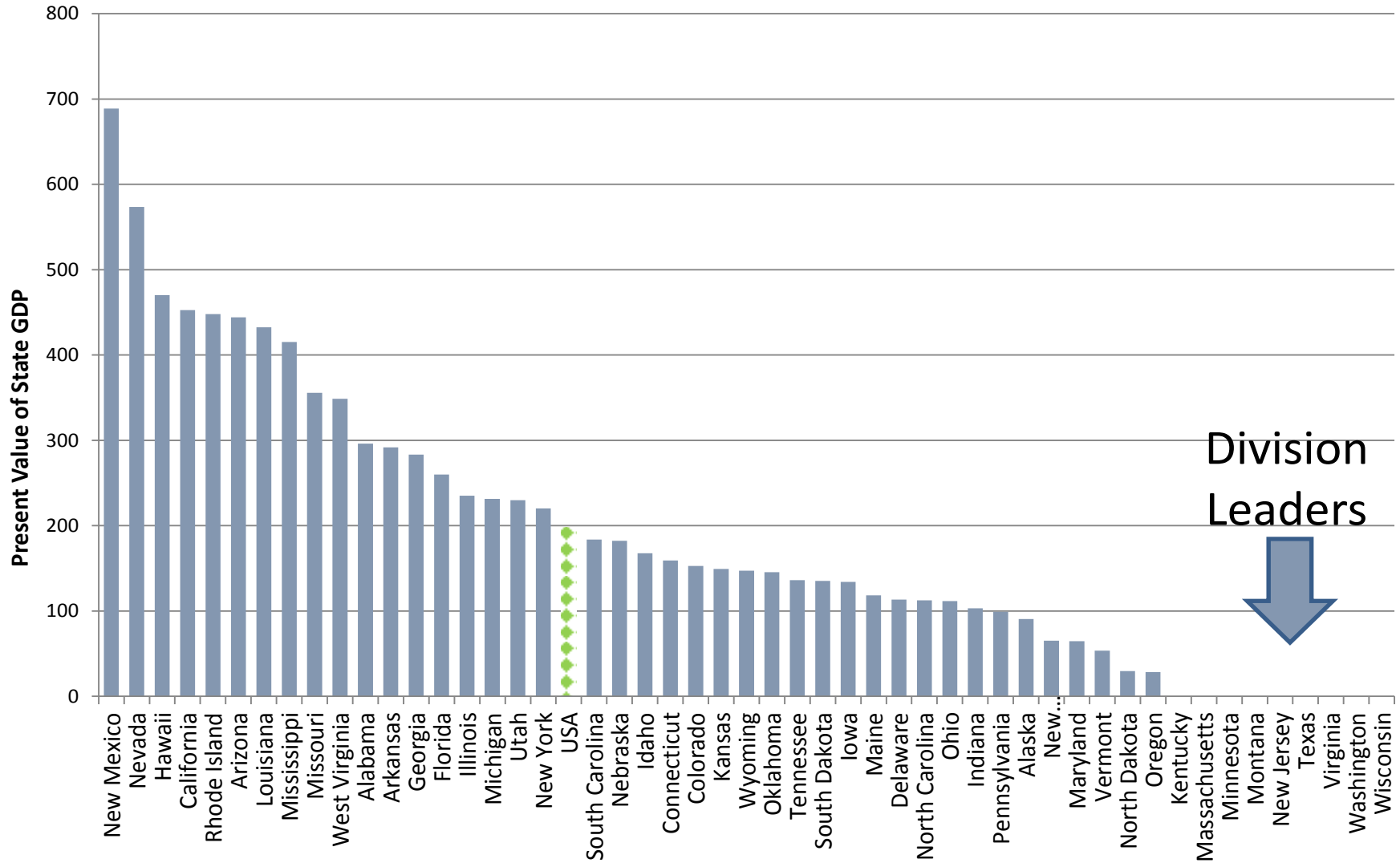
# Value of Improvement to Montana

1. Increasing average achievement by  $\frac{1}{4}$  standard deviation.
2. Bringing each state up to the best state (Minnesota).
3. Bringing each state up to the best in the geographic division (Montana).
4. Bringing all students in a state up to the NAEP basic level.
5. Scenario 2 with single state improvement.
6. Equaling Canada
7. Equaling Finland

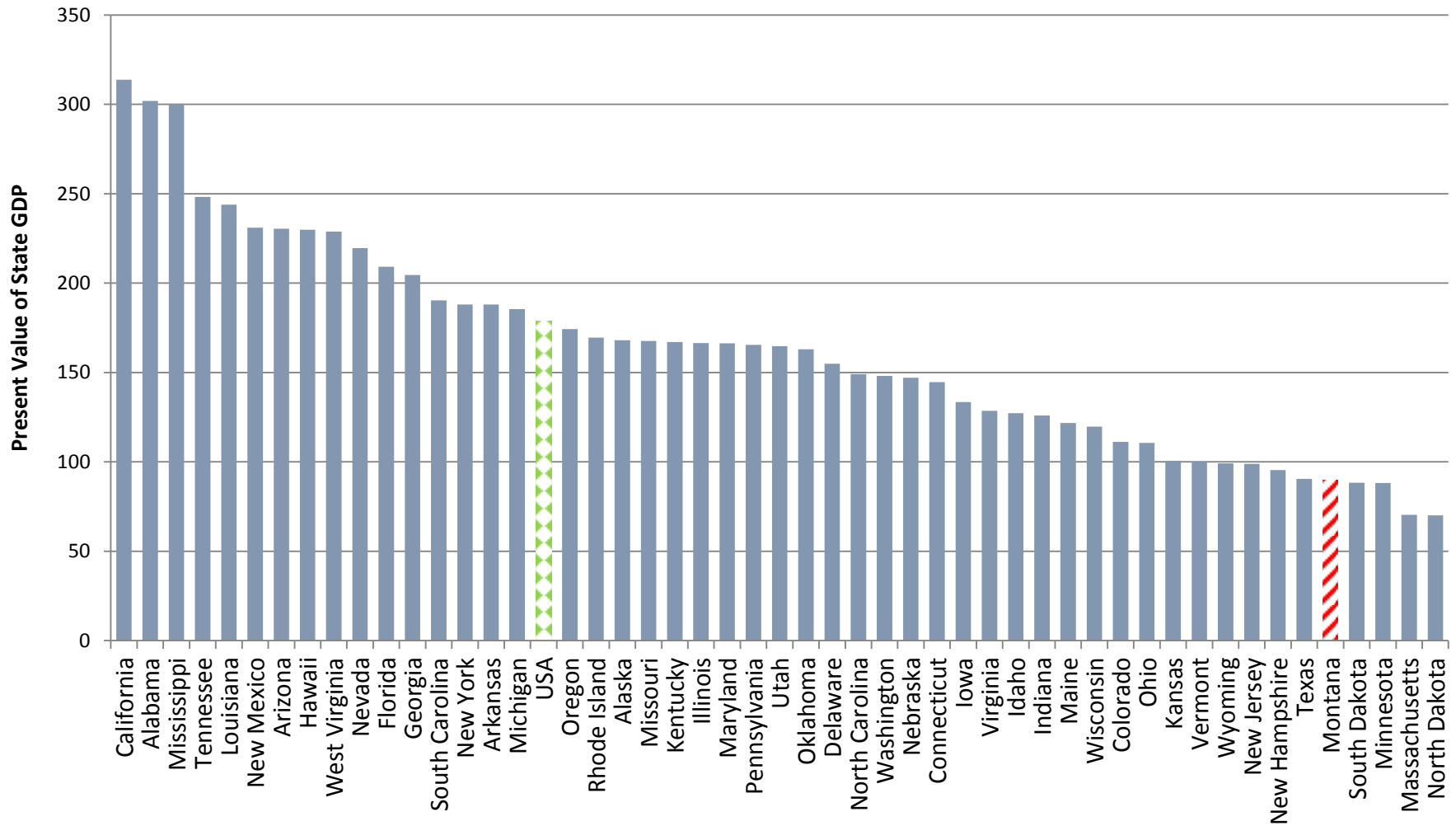
## 2. Equal Minnesota level: 63% of current GDP



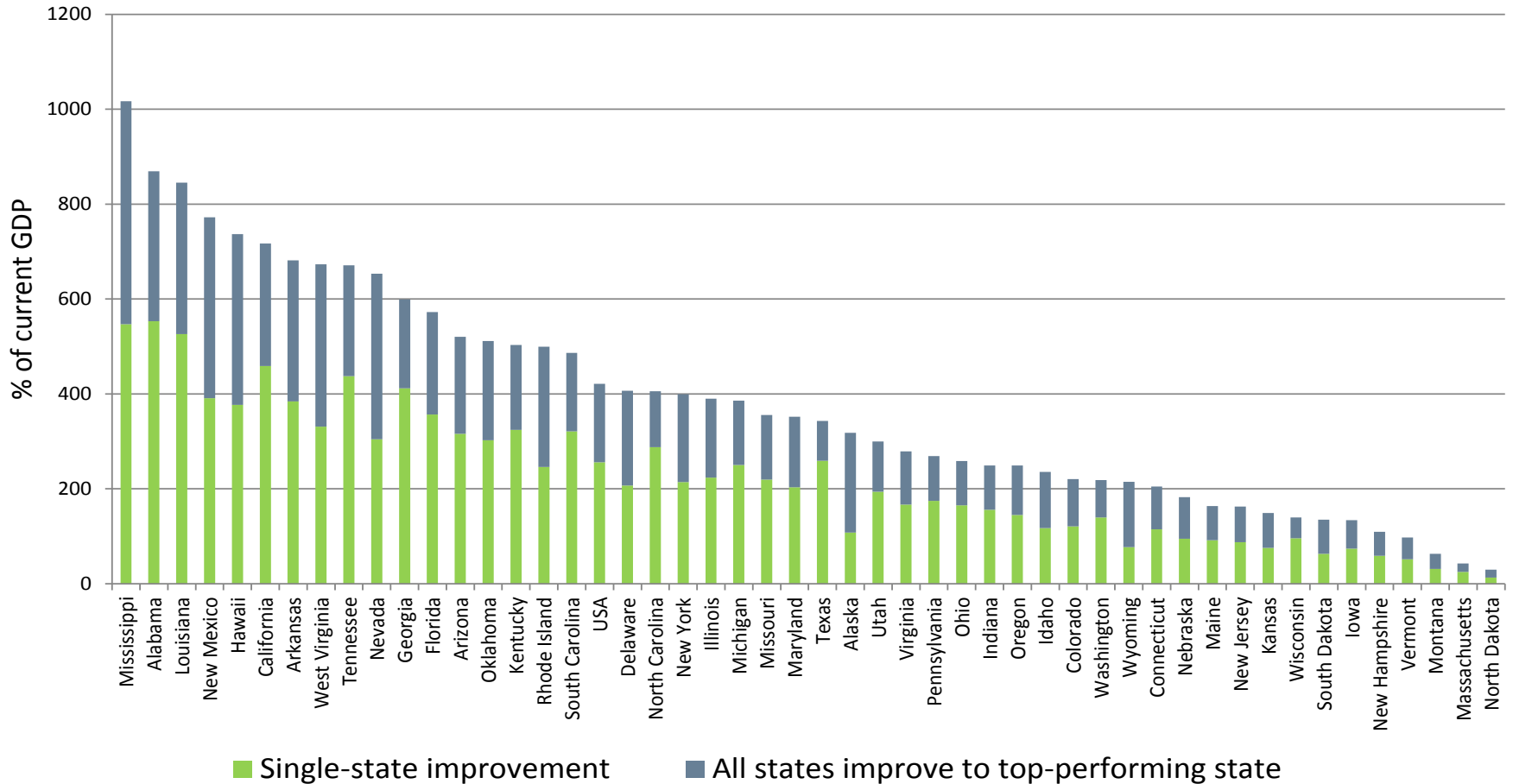
# 3. Equal Montana level: 0% of Current GDP



# 4. All students to basic: 90% of state GDP



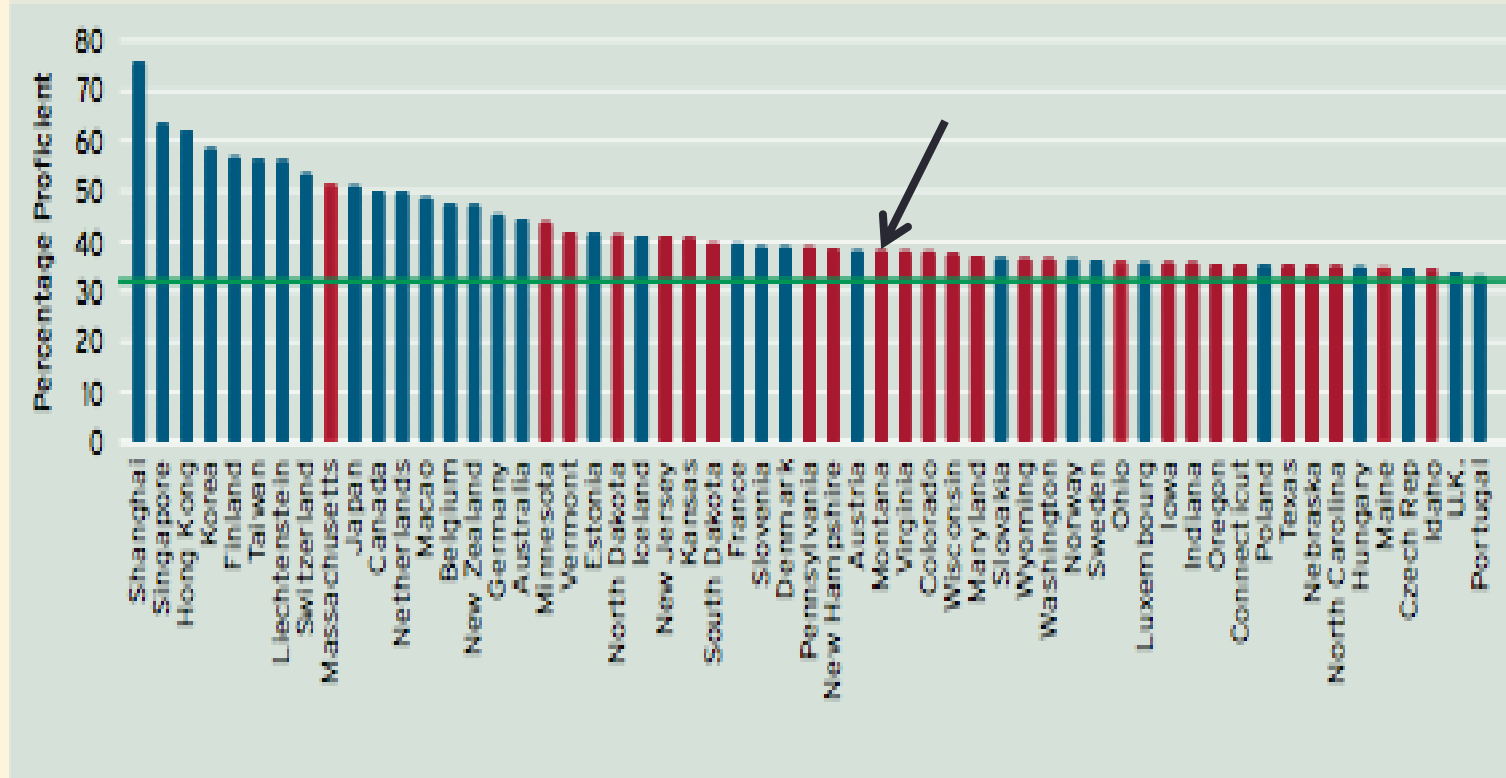
# 5. Single v. All States Improve to Best



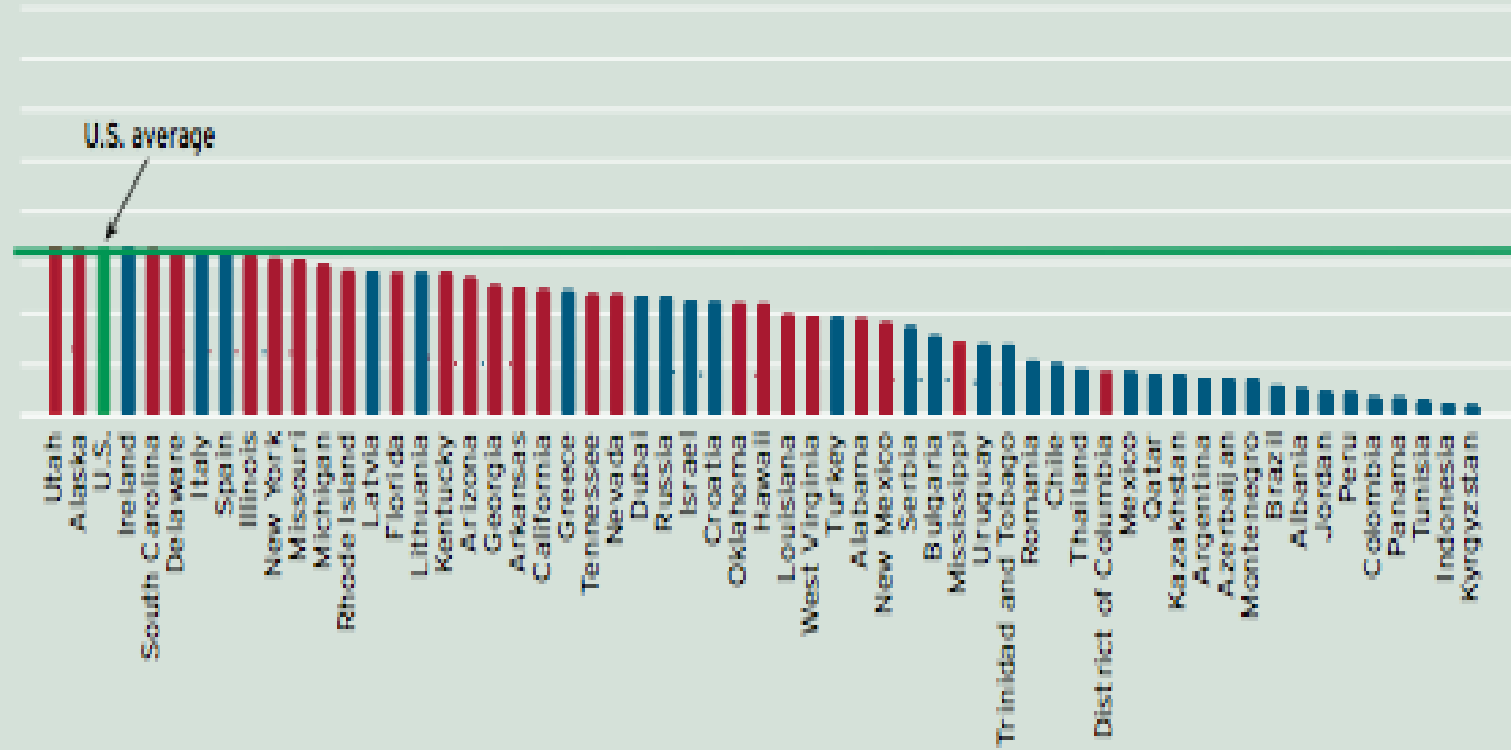
# International Challenge

- Unfortunately the challenge extends beyond U.S. borders and includes countries around the world.
- Other countries are producing students with both more education and better education.

## Percentage of students in the class of 2011 at the proficient level in math in U.S. states and foreign

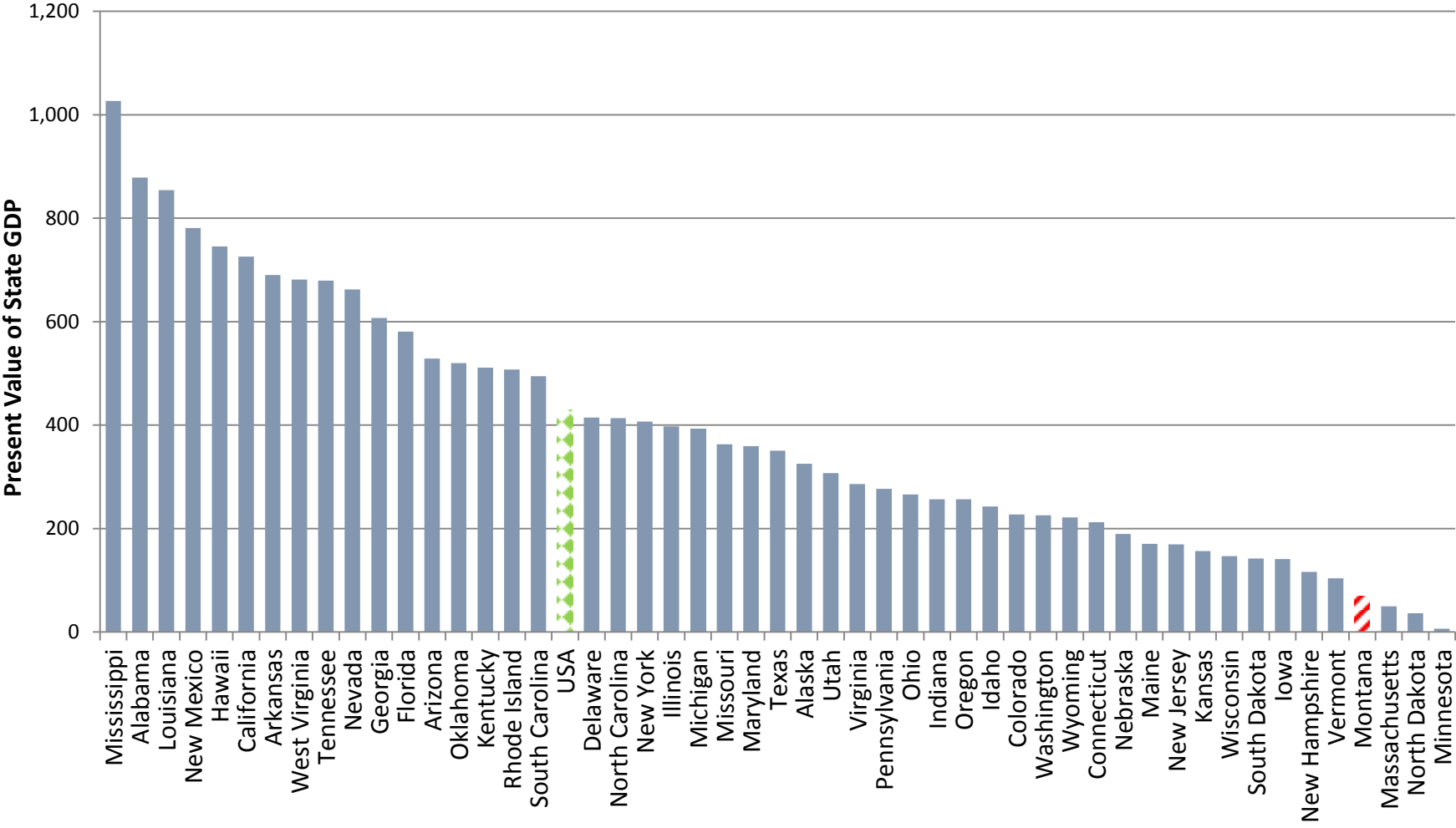


## jurisdictions participating in PISA 2009. (Figure 1)

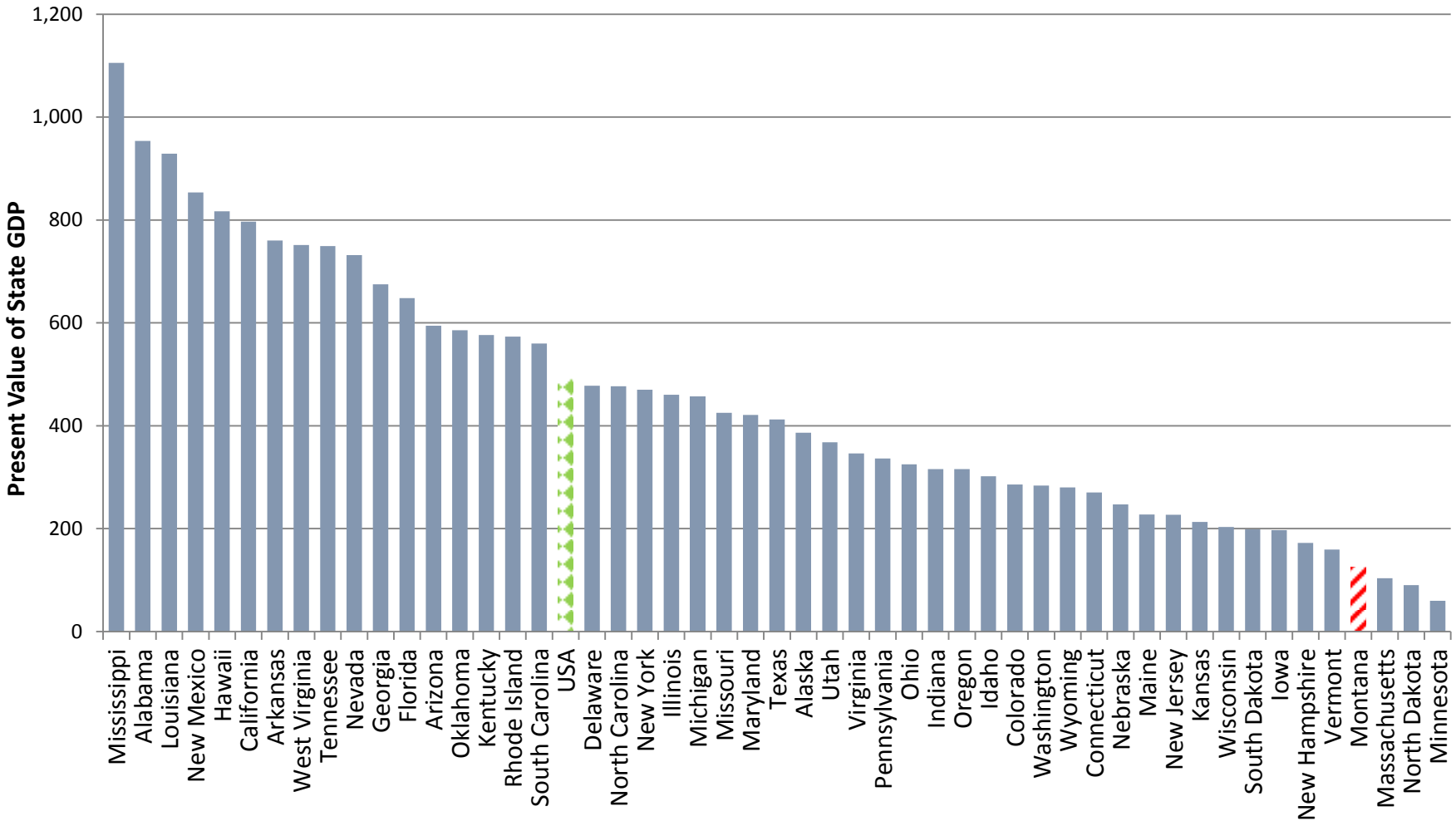




# 6. Equal Canadian level: 70% of current GDP



# 7. Equal Finnish level: 125% of current GDP



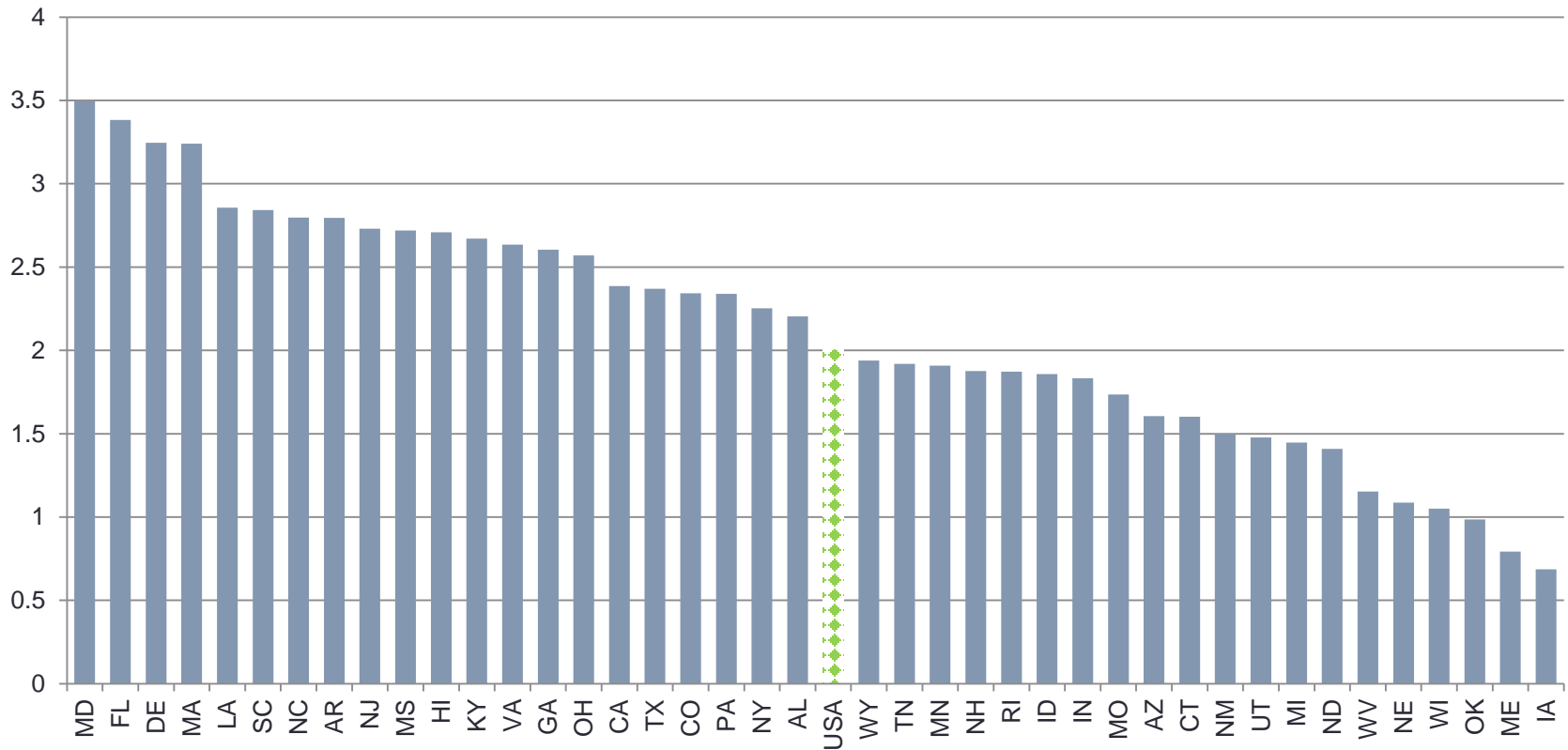
# Summary of Improvement: Montana

Improvement	Discounted reform billion \$'s	% current GDP	% future GDP without reform
1. ¼ stnd deviation	123	262	5.6
2. Equal Minnesota	30	63	1.4
3. Equal division best (MT)	0	0	0
4. All at least basic	42	90	1.9
5. Single state to best (MN)	59	127	2.7
6. Equal Canada	33	70	1.5
7. Equal Finland	58	125	2.7

# THE CHALLENGE

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# Improvement is Possible: Gains on NAEP 1992-2009



# No Simple Answers

Improvement is possible but not easy

