Open Policy Analysis: Frontiers for Government Transparency

Fernando Hoces de la Guardia

UC Berkeley:
Berkeley Initiative for Transparency in the Social Sciences

EDI, UC Berkeley
August 27, 2018

1. Why we need Open Policy Analysis (Hoces de la Guardia, Grant & Miguel, 2018)

2. Application to policy estimates of the minimum wage.

Policy Analysis And The Evidence-Based Policy Movement

Evidence-Based movement is growing.

- "The golden age of evidence-based policy" (Haskins 2017).
- Credible causal evidence (Angrist & Pischke, 2010)
- Transparency and reproducibility of research (Miguel et al. 2014).

Policy Analysis is a fundamental link.

- As many definitions as textbooks (Dunn, 2015; Weimer & Vining, 2017; Williams, 1971)
- Common denominator: client-oriented empirical analysis meant to inform a specific policy debate
- Aspires at scientific rigor. (Wildavsky 1979),

Policy Analysis And The Evidence-Based Policy Movement

Evidence-Based movement is growing.

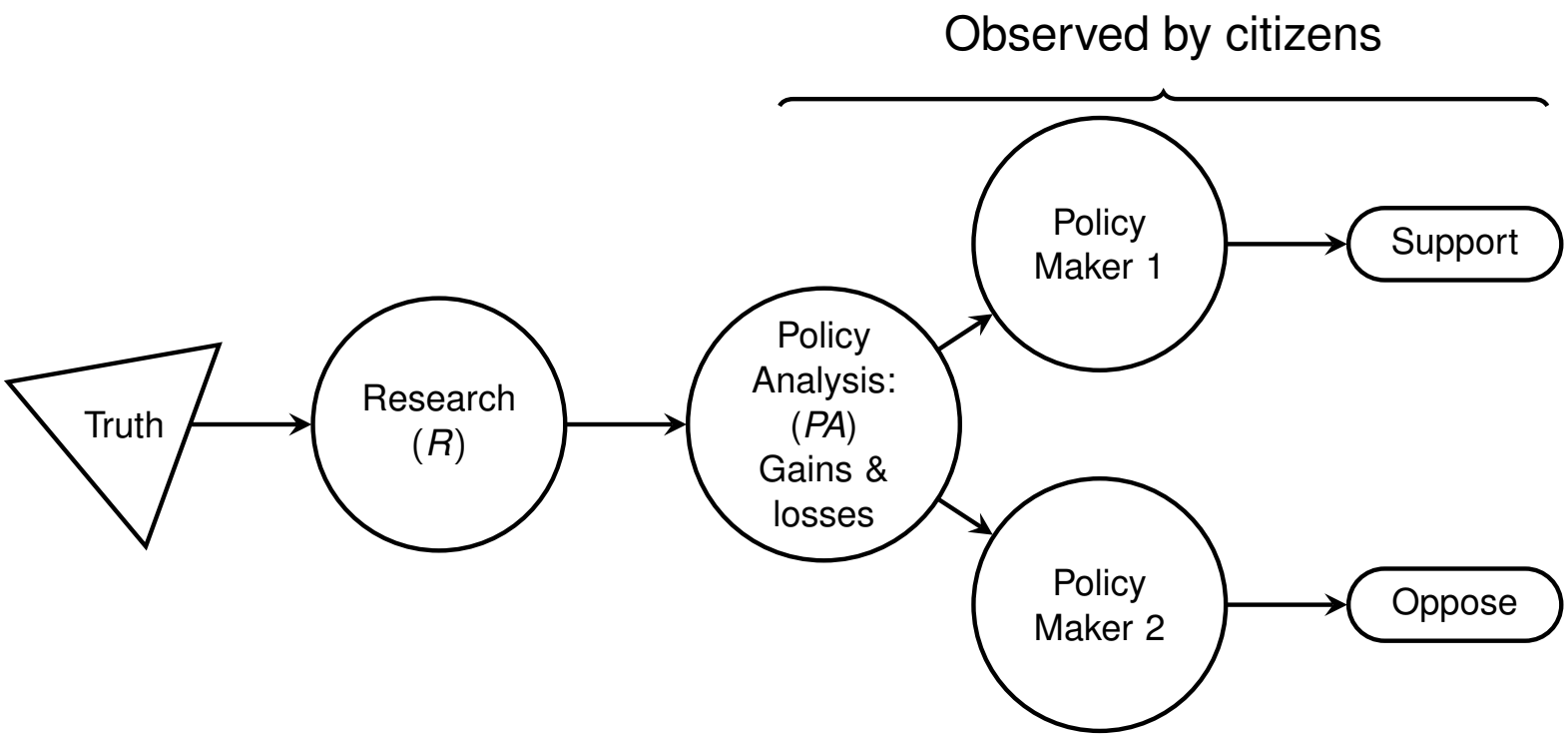
- “The golden age of evidence-based policy” (Haskins 2017).
- Credible causal evidence (Angrist & Pischke, 2010)
- Transparency and reproducibility of research (Miguel et al. 2014).

Policy Analysis is a fundamental link.

- As many definitions as textbooks (Dunn, 2015; Weimer & Vining, 2017; Williams, 1971)
- Common denominator: client-oriented empirical analysis meant to inform a specific policy debate
- Aspires at scientific rigor. (Wildavsky 1979),

Examples of Policy Analysts

One Ideal Evidence-Based Policy Link



Reproducibility Crisis In Empirical Research

- Large magnitude of publication bias (Franco et al 2014).
- Evidence of extensive p-hacking across social science disciplines (Gerber et al 2008, Brodeur et al 2016).
- Replication rates are low (Collaboration et al, 2015 , Camerer et al, 2016).
- Computational reproducibility is also low (Stodden et al 2016, Chang and Li 2015, Gertler et al 2018).

The Open Science Movement

- Definition of principles of Open Science/Research Transparency (Miguel et al 2014)
- Development of guidelines to operationalize principles of Open Science (Nosek et al 2015)
- Journals and funders: Journals (Science + 5k other journals), Registries (AEA), Funders (NIH, NSF and multiple donors)

Credibility Crisis Of Policy Analysis

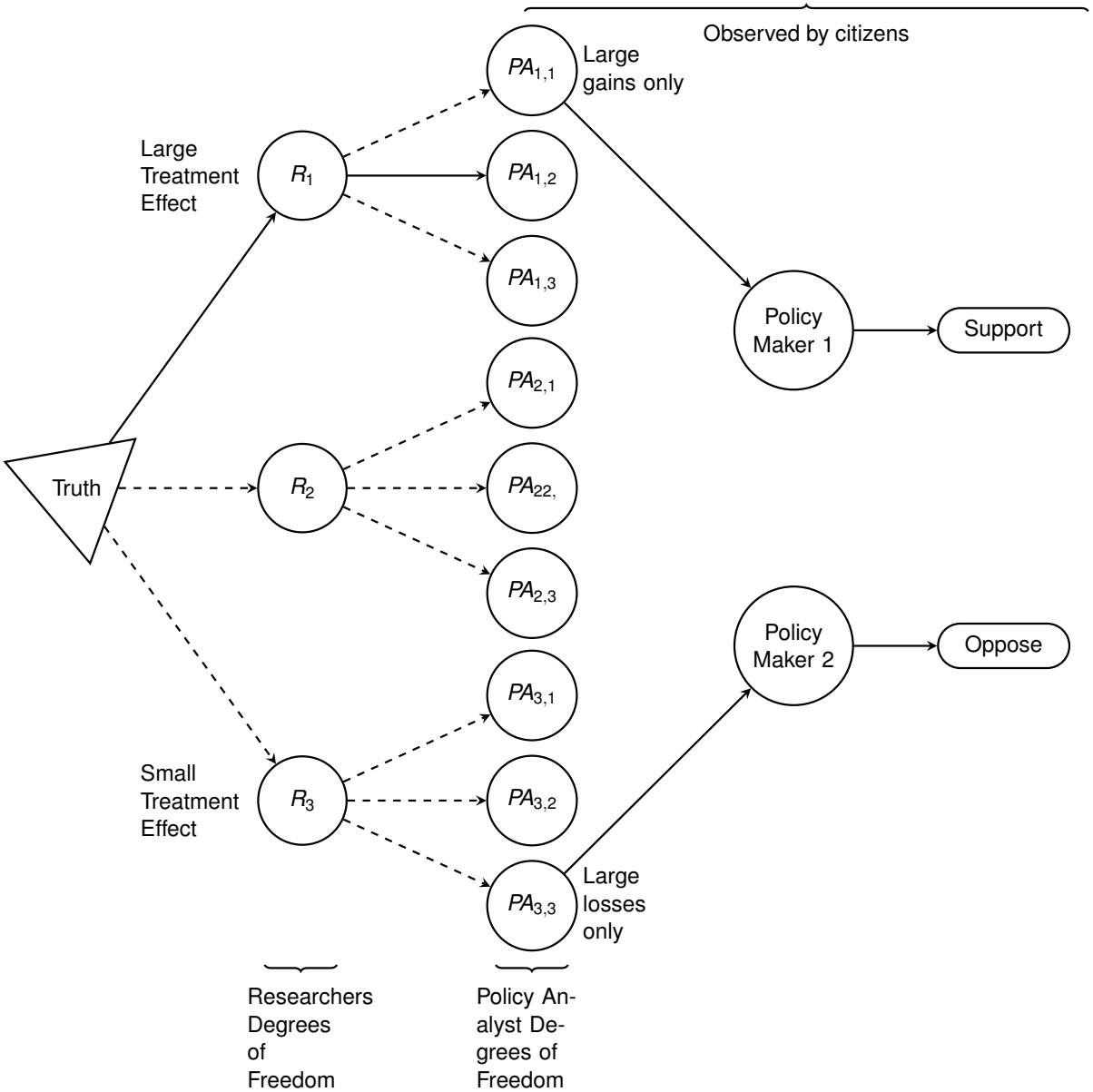
- Incredible Certitudes (Manski, 2013)
- Report wars (Wesselink et al, 2013)
- Alternative facts ("The Death of Expertise" Nichols, 2017; "The Death of Truth", Kakutani 2018; "Truth Decay", Rich & Kavanagh 2018)

Credibility Crisis Of Policy Analysis

- Incredible Certitudes (Manski, 2013)
- Report wars (Wesselink et al, 2013)
- Alternative facts (“The Death of Expertise” Nichols, 2017; “The Death of Truth”, Kakutani 2018; “Truth Decay”, Rich & Kavanagh 2018)

How This Affects The Evidence Based Policy Link?

How This Affects The Evidence Based Policy Link?



Relevance

Main consequences of policy analysis that lacks openness:

1. Cherry picking evidence.
2. Challenging to automate and improve systematically recurring reports.
3. Difficulty understanding how research informs policy analysis.

Cherry Picking Evidence

"When I was director of the CBO, I was very frustrated when we would write a policy report [saying] a certain policy would have these two advantages and these two disadvantages, and the advocates would quote only the part about the advantages, and the opponents would quote only the part about the disadvantages. That encourages the view that there are simple answers. There aren't generally simple answers. There are trade-offs."

— Douglas Elmendorf (Director of CBO, 2009-2015)
Harvard Magazine, 2016

Cherry Picking Evidence

"When I was director of the CBO, I was very frustrated when we would write a policy report [saying] a certain policy would have these two advantages and these two disadvantages, and the advocates would quote only the part about the advantages, and the opponents would quote only the part about the disadvantages. That encourages the view that there are simple answers. There aren't generally simple answers. There are trade-offs."

— Douglas Elmendorf (Director of CBO, 2009-2015)
Harvard Magazine, 2016

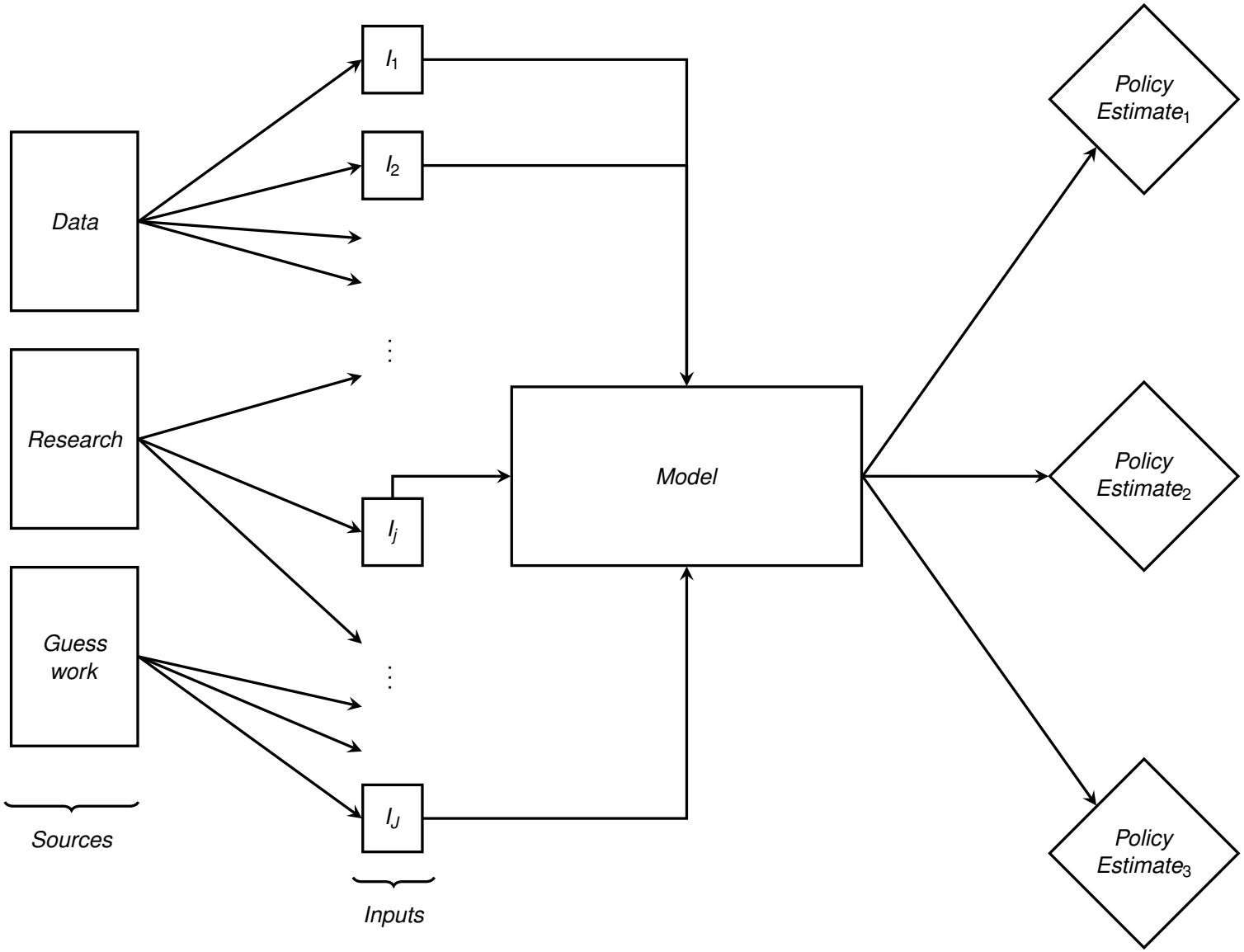
Open Science

	Empirical Research	Policy Analysis
Problems	Reproducibility Crisis	Credibility Crisis
Solutions	*Open Science* Principles, Guidelines, Applications	

Open Policy Analysis

	Empirical Research	Policy Analysis
Problems	Reproducibility Crisis	Credibility Crisis
Solutions	*Open Science* Principles, Guidelines, Applications	*Open Policy Analysis* Principles

The Process of Policy Analysis



Principles for Open Policy Analysis

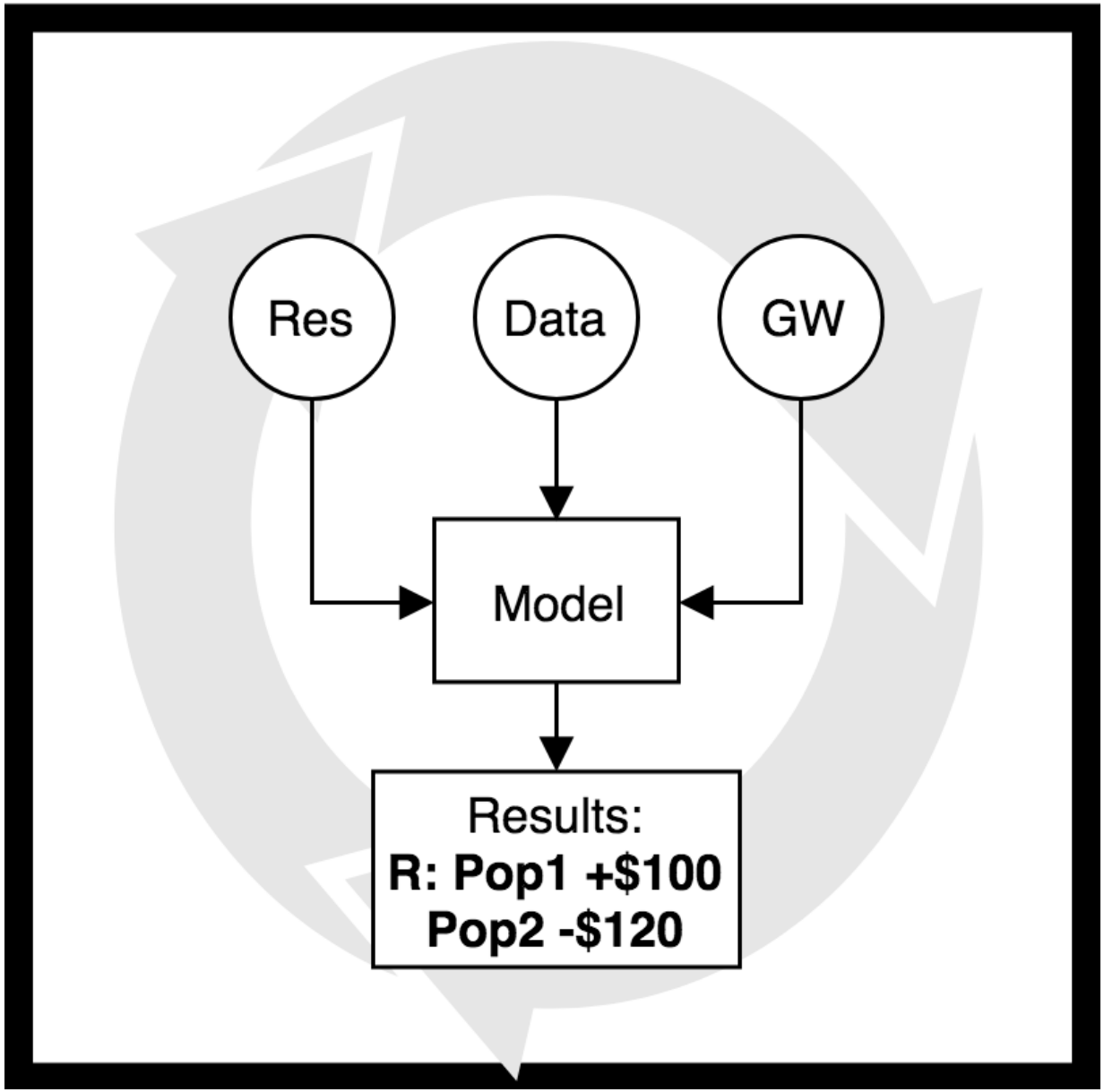
Proposed principles:

1. Computational Reproducibility
2. Analytic Transparency
3. Output Transparency

Principle 1: Stop re-inventing the wheel

Computational Reproducibility

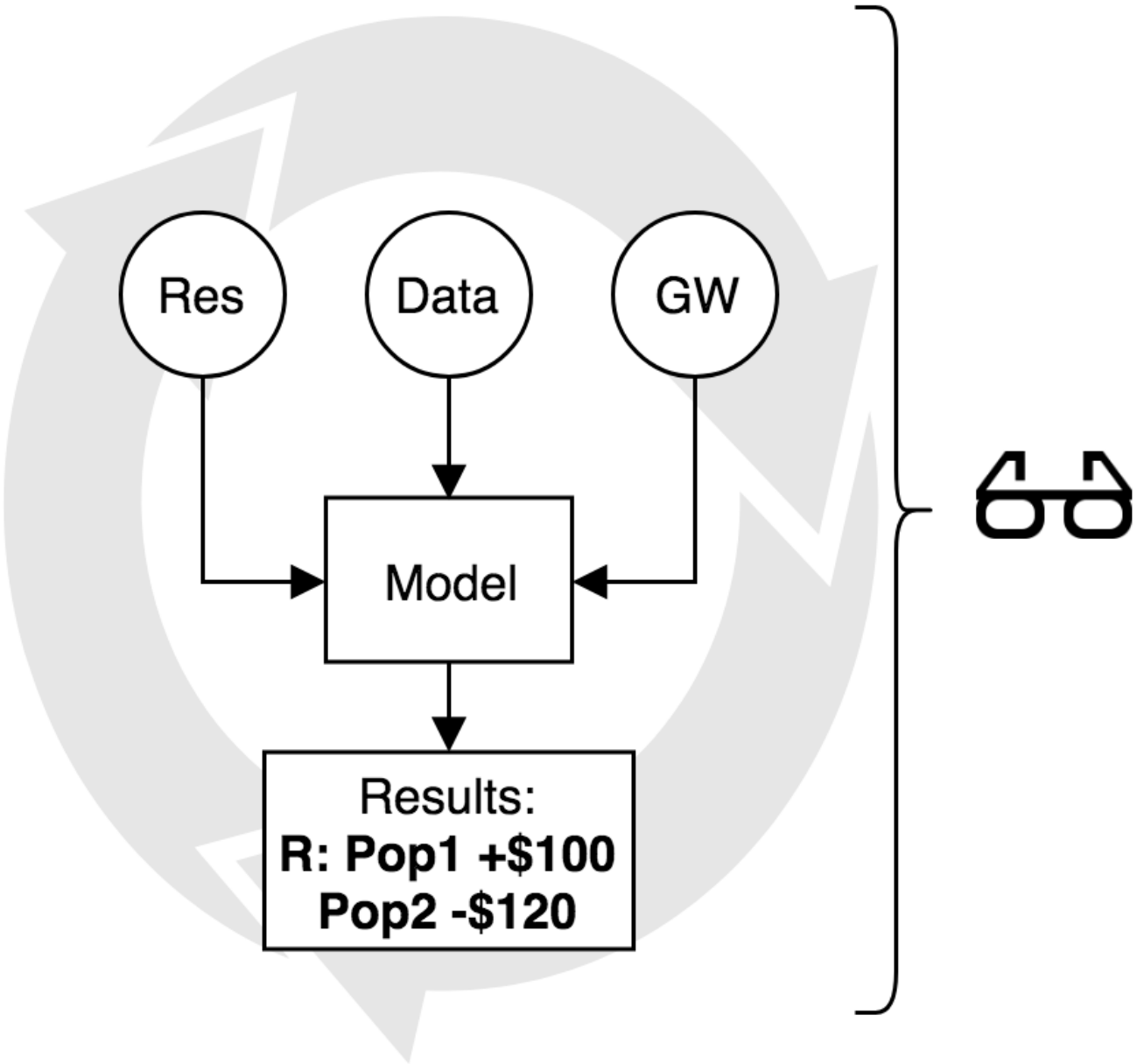
- Literate Programming
- Version control
- File structure
- **Label sources**



Principle 2: Show your work (readable)

Analytic Transparency

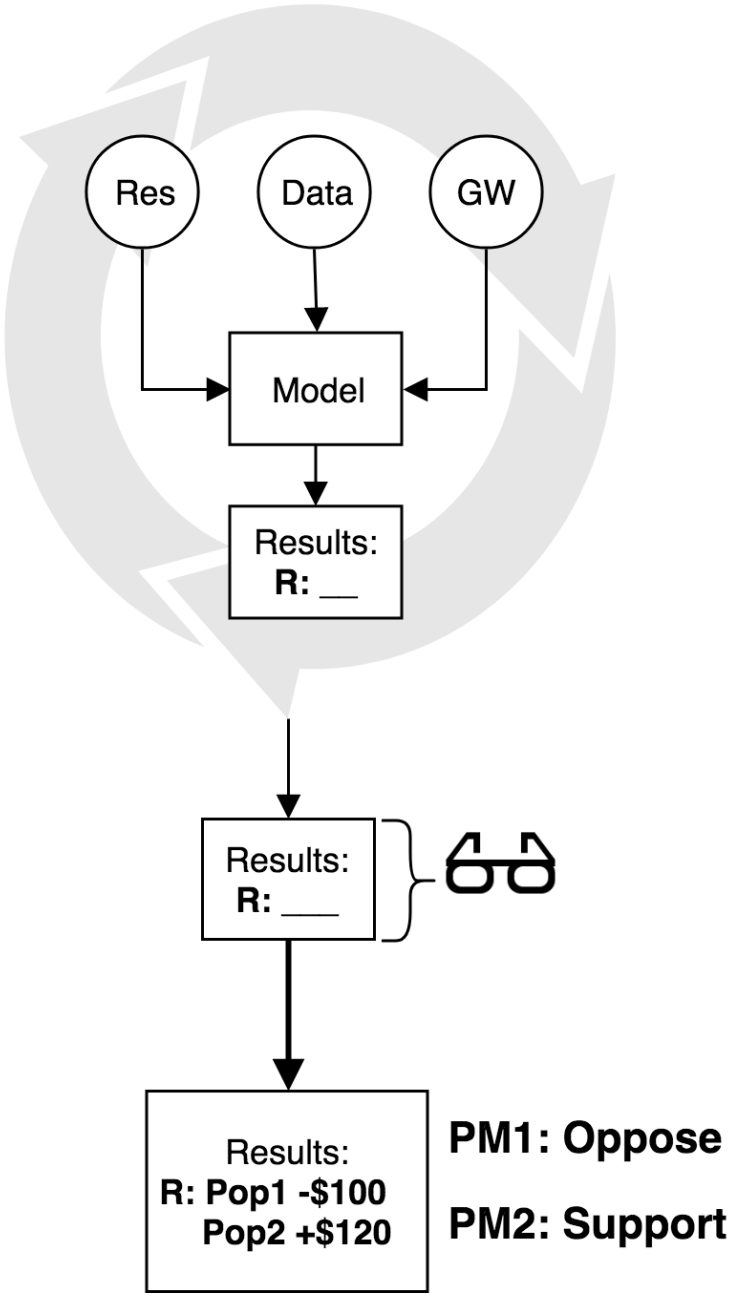
- Open code
- Open data
- Report as Dynamic Document



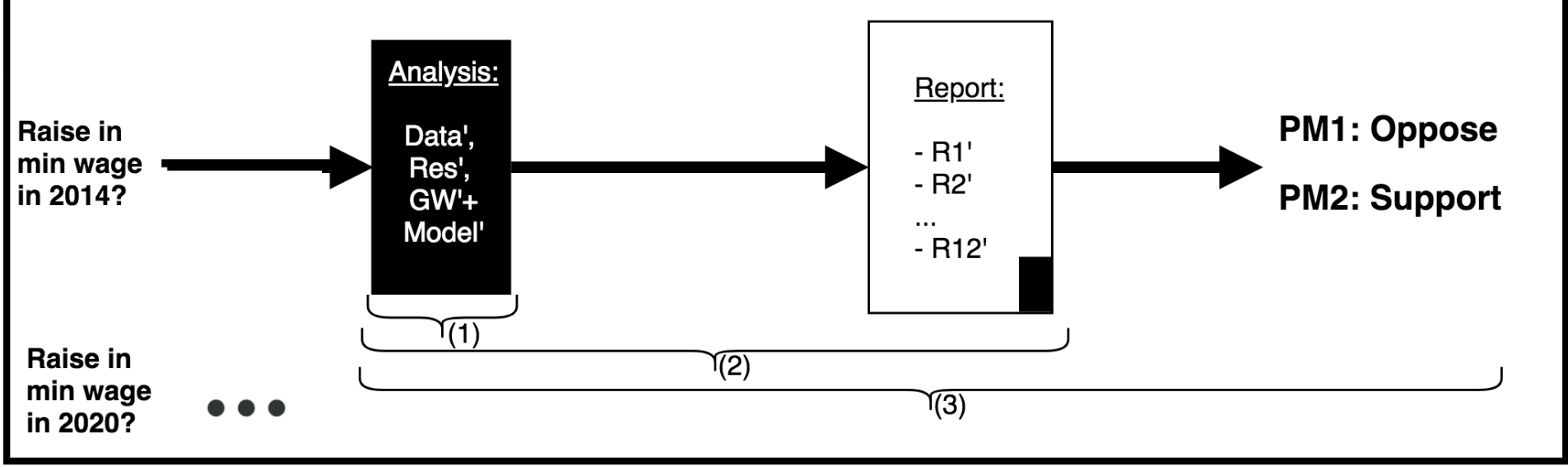
Principle 3: Let's all agree on one table/viz

Output Transparency

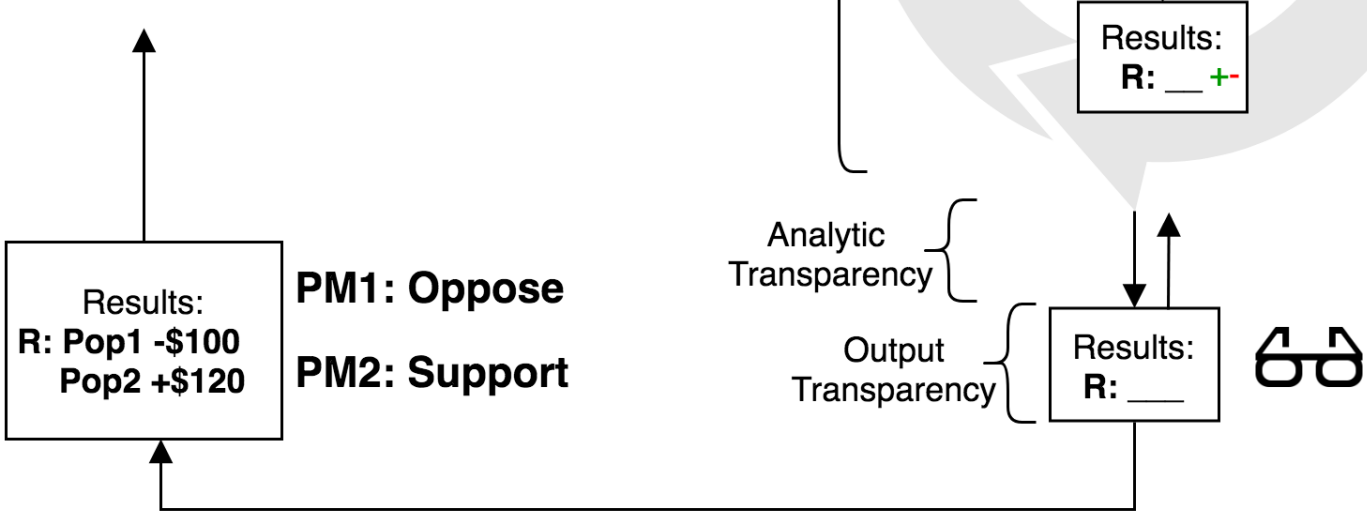
- Pre-committed output display
- Assumptions-output link



S


Raise in min wage in 2014?
Analysis:
Data', Res', GW'+ Model'
Report:
- R1'
- R2'
...
- R12'
PM1: Oppose
PM2: Support
Raise in min wage in 2020?
(1)
(2)
(3)

S


Results:
R: __ +-
Analytic
Transparency
Output
Transparency
Results:
R: ___
Results:
R: Pop1 -$100
Pop2 +$120
PM1: Oppose
PM2: Support

1. Why we need Open Policy Analysis (Hoces de la Guardia, Grant & Miguel, 2018)

2. **Application to policy estimates of the minimum wage.**

Description of Case Study

"The Effects of a Minimum-Wage Increase on Employment and Family Income" Congressional Budget Office (2014)

Description: CBO estimated the effects of a raise in the federal minimum wage from $7.25/hr to $10.10/hr.

Main policy estimates:

- 500,000 jobs would be lost.
- 16.5 million workers would receive a salary increase.
- Distributional effects: below poverty line (PL) +$5billion; between one and three PL +$12billion; between three and six PL +$2billion; above six PL -$17billion

Key research estimate: Elasticity of labor demand for teenagers in the labor force.

Adapting TOP Guidelines to Policy Analysis

☑	Dimensions	0	1	2	3
	Computational Reproducibility				
☐	1. Follow a common template for file structure		Some FS	Standard FS	SFS + sources dir
☐	2. Label and document each input sources (data, research, guesswork)		List	+ sources	+detailed links/ref.
☐	3. Make code readable.		Scripts in repo/ xls with SOPs	High readability + QA report	One-Click (DD)
☐	4. Use a version control strategy.		Some naming	Clear naming	Git
	Analytic Transparency				
☐	5. Open Code		Final	Final + prep	Human read (DD)
☐	6. Open Data (raw & analytic files).		Final	Final+raw	+ repository `+ inst 4 S.I.
☐	7. Open Report		Final	Final + VC	+ DD
☐	8. Open notes		List	Final	Final+VC
	Output Transparency.				
☐	9. Define results format before publishing/justify changes format output		General	Specific	Specific +

Applying Guidelines to Build an Open Report

DEMO

Sensitivity Analysis: Status Quo

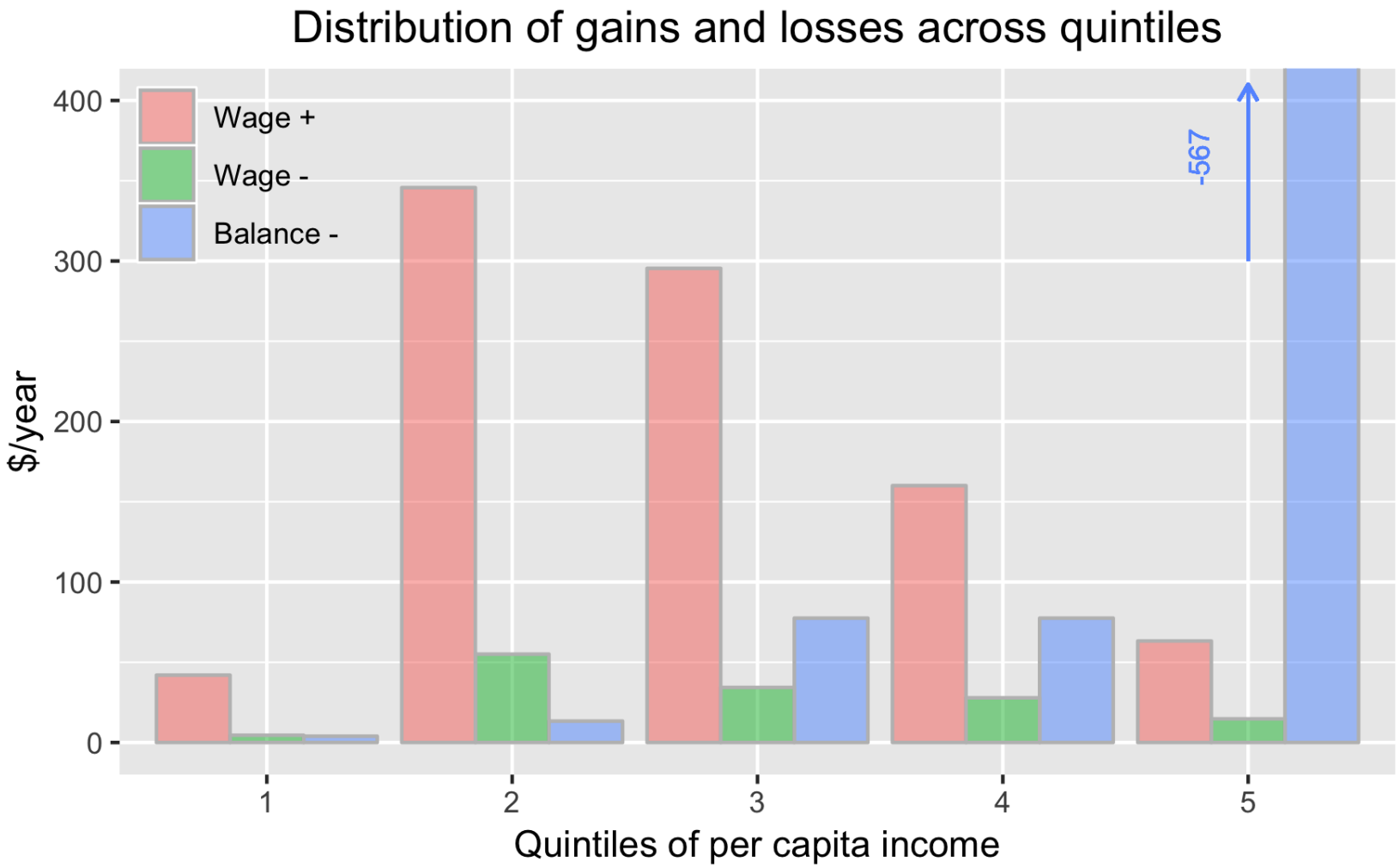


Figure: Default settings

SA: Change in Elasticity of Labor Demand

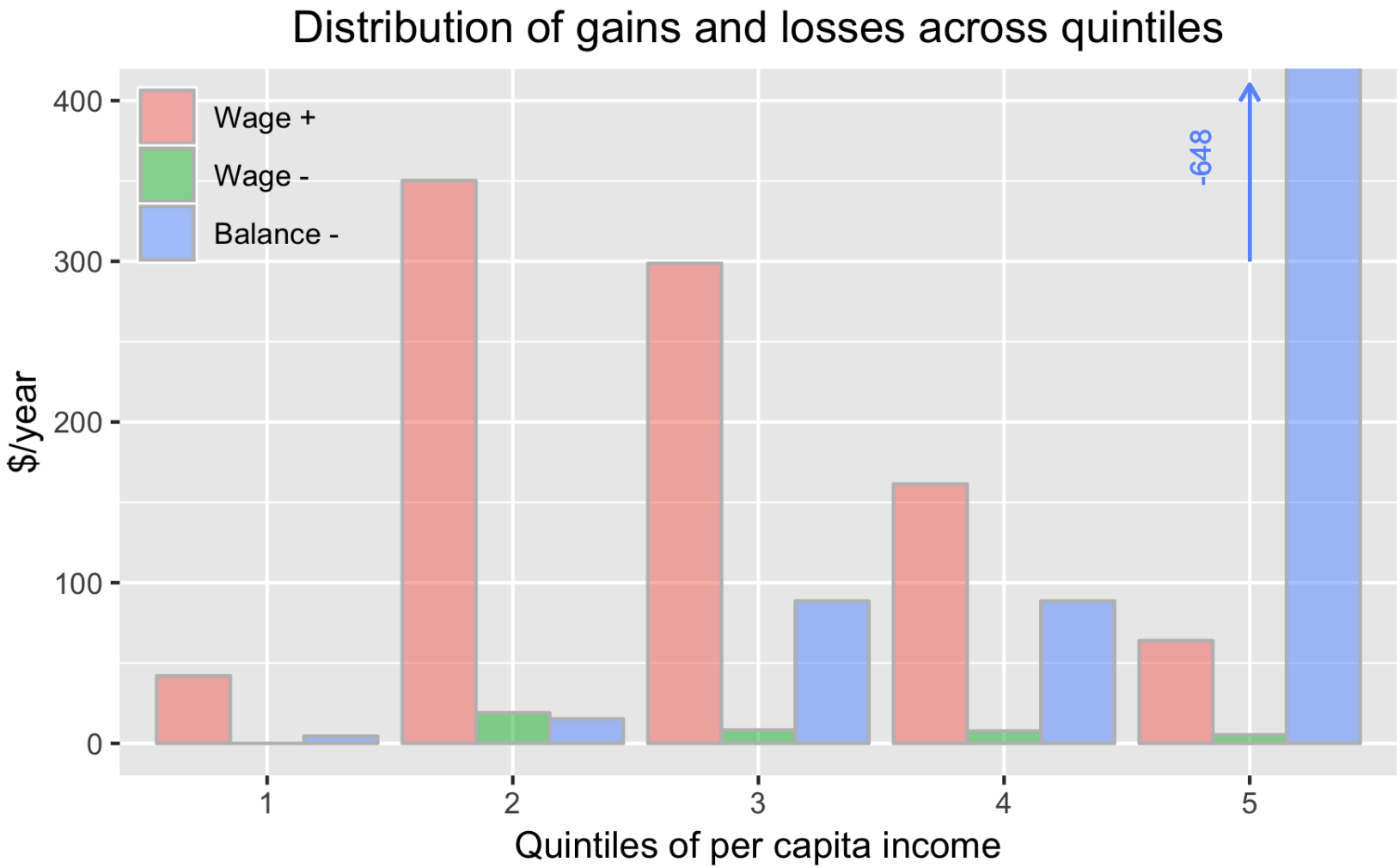


Figure: From $\eta_{lit}^{teens} = -0.1$ to $\eta_{lit}^{teens} = -0.01 (\Delta^{-} 90\%)$

Sensitivity Analysis: Status Quo

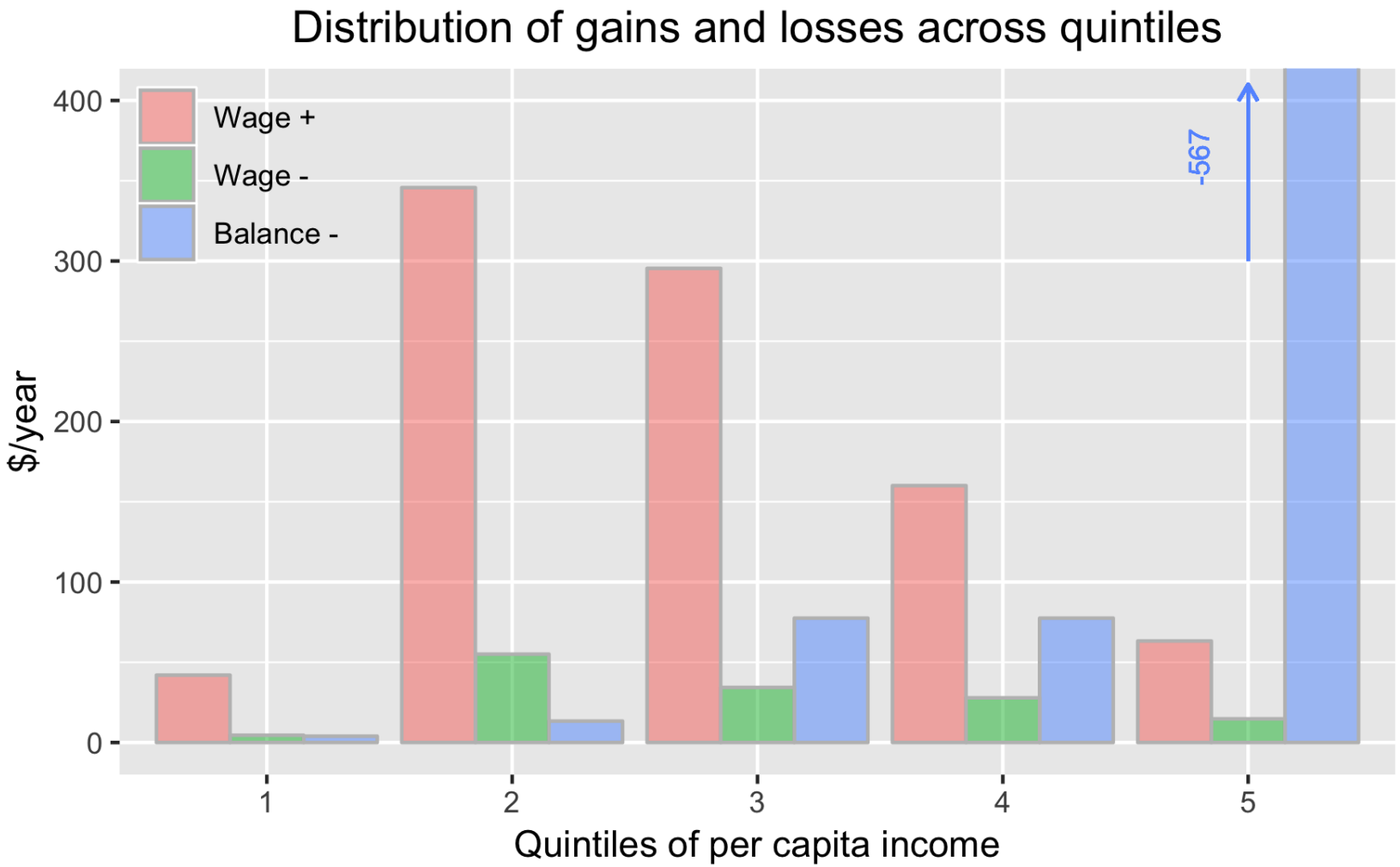


Figure: Default settings

SA: Change in Distribution of Balance Loses

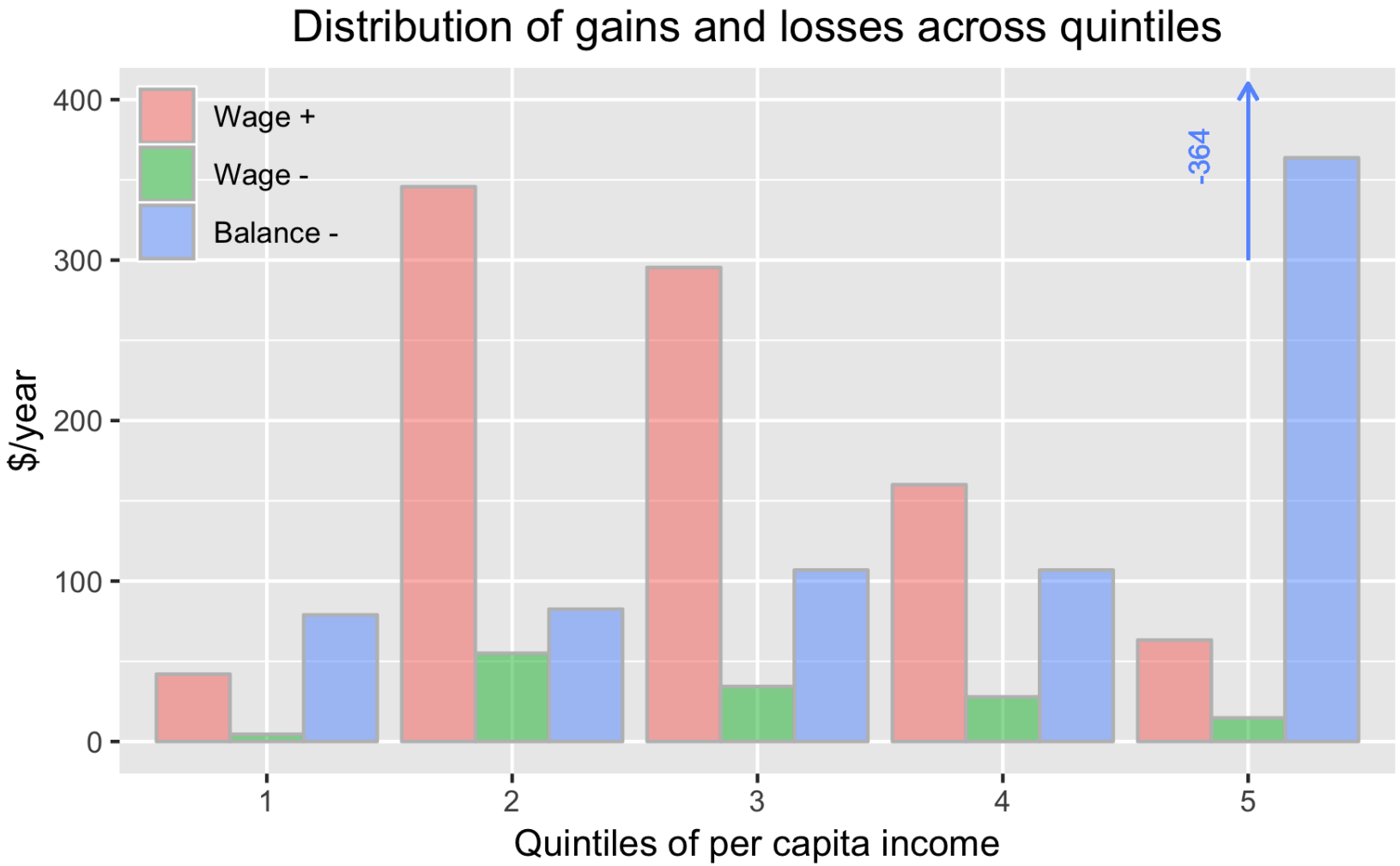


Figure: From $(1PL, 6PL) \sim (1\%, 29\%, 70\%)$ to $(20\%, 40\%, 40\%)$

Sensitivity Analysis For Multiple Parameters

Table: $\%\Delta W$ for a $\%\Delta$ in inputs. Two sample policy makers.

		Re-distributional Preferences			
		Dislikes ($\rho = -0.1$)		Likes ($\rho = 0.1$)	
Source	Input	$10\%\Delta^+$	$10\%\Delta^-$	$10\%\Delta^+$	$10\%\Delta^-$
Data					
	Annual wage growth (g_w)	-3%	2%	-2%	1%
	Annual growth in N	0.8%	-0.9%	0.5%	-0.5%
Research					
	η_{teen}	-4%	4%	-2%	2%
	Ripple Scope $(8.7, 11.5)$	37%	-24%	21%	-14%
	Ripple Intensity $(50\%\Delta w)$	5%	-5%	3%	-3%
Guess Work					
	Extrapolation factor (F_{ex})	-3%	2%	-1%	1%
	Non compliance (α_1)	-7%	7%	-4%	4%
	Substitution factor (F_{sub})		20%		-8%
	Net benefits	-5%	5%	2%	-2%
	Distribution of balance losses				
	Current: $(1\%, 29\%, 70\%)$				
	$(1\%, 4\%, 95\%)$	22%		13%	
	$(5\%, 35\%, 60\%)$	-17%		-9%	
	$1/N$	-129%		-73%	

Limitations

- There is additional scope for reproducibility.
- Complete case study requires extensive institutional knowledge.
- Guidelines need to be build based on consensus of practitioners.

What lies ahead

Let's assume this becomes the new status quo.

- Costs of producing the next report on effects of minimum wage will be very small.
- Every additional effort will imply improvements on the "state of the art" report (e. g. *dBL*; $\eta(MW), \alpha_1(MW)$)
- Learning about one parameter (QALYs, DWL) will update estimates *across* reports.
- Much easier to have a substantive and normative policy debate. Pilot example: `Shiny App!`.

Your next steps to push OPA forward

- Collaborate with BITSS to open up your PA.
- Fund OPA: directly or conditionally.
- Train students/analysts in OPA.
- Present/showcase your OPA. Pioneers: GiveWell, AEI.
- Nominate a PA to be open here.

Thank you.

Pre-prints:
Why OPA
OPA Case Study

Slides at
https://tinyurl.com/yacz2z78

fhoces@berkeley.edu