Slavery, Causation, and Contribution

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This paper is about two ideas, both with a long history. The first idea has lived its life entirely outside of philosophy. It is the empirical claim that enslaved labor made America rich. The second idea has likewise lived its life in the outdoors, but it has played an important role in political philosophy, too. It is the normative claim that workers, enslaved and free, are entitled to the fruits of their labor, that they deserve pay commensurate with the value of their *productive contribution*.

I argue for two theses, one about each idea. The first thesis is that the ongoing debate about whether enslaved labor made America rich is based in part on a failure to make the philosophically orthodox distinction between causation and counterfactual dependence. The second thesis is that this same distinction between causation and counterfactual dependence helps transform our understanding of the principle of reward according to contribution.

The debate about whether enslaved labor made America rich is nearly as old as American slavery itself: slavery's apologists argued that it did; conventional wisdom across the North was that it did not. In its most recent iteration, the "economics-of-slavery culture wars,"[1] it is a debate between history departments and economics departments—between narrative economic historians and economic historians who use the methods of econometrics, or *cliometricians*. Over the last decade, in a body of work referred to as the "New History of Capitalism," the narrative historians have argued that enslaved labor made a very important contribution to America's economic

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[1] Wright 2017.

growth.[2] In several reviews of this body of work, the cliometricians claim to have already shown, in the decades preceding the New History's emergence, that slavery if anything slowed growth, that it was an economic albatross as well as a moral catastrophe.[3]

My first thesis is that the narrative economic historians (from now on just "historians") and the cliometricians are partly talking past one another. The historians are talking about causation: they claim that enslaved labor was a cause of America's prosperity. The cliometricians take themselves to be talking about causation, too, but they are really talking about counterfactual dependence: they claim that America would have been just as rich, if not richer, had it abolished slavery upon its founding. These two claims are compatible. Counterfactual dependence is not necessary for causation: a cause will make no difference to what it (nonetheless) causes when it *preempts* a would-be replacement. And this is what is going on in the case of American slavery: even if "free labor" would have produced cotton in slavery's absence, these would-be replacements were preempted; in fact cotton was produced by enslaved people. The distinction between counterfactual dependence and causation is not unique to philosophy: it is at least implicit in some of the causal inference techniques used in the social sciences. But the distinction has been a central and explicit focus of philosophical work on causation. That philosophical work, I argue, gives us the resources to adjudicate the debate about slavery in a precise way.

My second thesis is that understanding productive contribution in causal terms, rather than in merely counterfactual ones, helps transform the principle of reward according to contribution. Start with the following puzzle. Despite its Marxist flavor, and despite its continual deployment within the actual labor movement, the principle—call it the Contribution Principle—is very unpopular among contemporary egalitarian political philosophers. Why? Well, it is one thing to say, in the traditional way, that some nineteenth-century factory owner in Industrial Revolution England exploits his workers because he takes too much of the fruits of their labor. But if that presupposes that workers are entitled to those fruits, then this left-wing condemnation of capitalist exploitation is going to end up vindicating serious inequality *within* the labor market. Some workers, after all, produce more fruit than

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[2]Johnson 2013; Beckert 2014; Baptist 2014; Schermerhorn 2015; Beckert and Rockman 2016.

[3]Engerman 2017; Hilt 2017; Olmstead and Rhode 2018; Majewski 2019; Wright 2020, 2022.

others, especially now that the Industrial Revolution is behind us. This is just a version of the challenge that G. A. Cohen famously raised for Marxists in *Self-Ownership, Freedom, and Equality.* As it happens I think that Cohen's original challenge is based on a mistake.[4] But even the best version of that challenge, I here argue, can be met: if we understand contribution in causal rather than in merely counterfactual terms, the Contribution Principle can be an egalitarian one. Thus egalitarian political philosophers can—and I think should—be like many egalitarians in the real world: they can be *productivists*,[5] people who believe that facts about who produced what are centrally important to the question of who should get what.

I will move back and forth between my two theses. In Section 1, I make a simple observation about the contribution made by low-wage workers, taken together—an observation that seems to have a radically egalitarian implication. In Section 2, in order to determine how to interpret that observation, I turn to the debate about the contribution that enslaved labor made to the American economy. I argue that the debate is partly dissolved by the distinction between causation and mere counterfactual dependence. (I make this same argument more precisely, using a structural equations model, in the Appendix.) In Section 3, I explain that this distinction, and in particular the irrelevance of replaceability to causation, underlies the simple observa-

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[4]Cohen argues that the Marxist theory of exploitation presupposes the thesis of *self-ownership*—the thesis that, roughly, persons have stringent ownership rights over themselves. The most important part of the thesis for present purposes is the right to transfer one's labor power, and the derivative right (Vallentyne et al. 2005: 204, n. 6.) to what one gets in exchange for transferring it, sometimes called the "right to income." The Contribution Principle presupposes neither of these; all it needs is the weaker idea that workers can *take moral credit* for what they achieve using their labor. More precisely, self-ownership is neither necessary nor sufficient for claim that workers are entitled to the fruits of their labor. It is not sufficient because to say that a worker is entitled to the pay promised them in a labor contract—entitled to the income that they can get from the labor that they are entitled to transfer—is not to say that this income is deserved on the basis of what they contribute. Self-ownership blesses a contract that pays a worker to sit around doing nothing; the principle of reward according to contribution does not. Nor is even a weak version of the thesis necessary: one can deny that workers have rights to transfer and to income while accepting the Contribution Principle. Consider someone who: accepts the principle; and, precisely because they accept the principle, thinks that the aforementioned idle worker's income should be taxed away; and, because they reject self-ownership, thinks there is no even *pro tanto* liberty-based reason not to do so. (Cf. Cohen 1995: ch. 6, n. 5 and Cohen 1979: n. 21. And note the similarity between the last clause of that sentence and David Gauthier's defense of taxing away "rents" [1986: 276].)

[5]Aas 2019: 71.

tion from the first section. In Section 4, I complicate the simple observation in the face of an objection but argue that its egalitarian import survives the complications.

One preliminary note. I said just above that egalitarian political philosophers can and should be productivists. But I only argue for the "can." My second thesis, about the Contribution Principle, is a conditional one: if workers deserve reward according to their contributions, then what they deserve is much more equal than is usually supposed. I let the antecedent rest on its common sense bona fides—its persistent popular appeal.[6]

1   A Simple Observation

Imagine that all the workers in the bottom half of the global income distribution—"low-wage workers"—stopped working. What would happen? Here is a plausible sounding answer: the global economy would grind to a halt; output would fall to zero, or near enough.

According to the most popular conception of "productive contribution," a worker's contribution is the difference that they make to the value of output—at least a very rough proxy, the thought goes, for the difference they make to the satisfaction of people's preferences—something in the neighborhood of what economists call their *marginal revenue product*.[7] Given anything like

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[6]See Miller 1999: ch. 4; Karagözoğlu 2012; Mulligan 2018: ch. 3. Perhaps the most common objection to the Contribution Principle is that workers cannot take credit for contributions enabled by the "natural talents" that they were merely lucky to be born with. Since most people are presumably aware that workers' contributions are enabled by their natural talents, the persistent popular appeal of reward according to contribution is indirect evidence for Samuel Scheffler's claim that, outside of political philosophy, "many people regard material inequalities deriving from differences of talent and ability as acceptable within limits" (2005: 10).

[7]The fairness- or desert-based (as opposed to instrumental) case for reward according to marginal product is as old as the concept of marginal product itself: see Clark 1899. For important contemporary defenses, see Miller 1999: ch. 6 and Mulligan 2018. For an overview, see Behrle forthcoming: secs. 1.3–1.4. Throughout the paper, even when I step away from marginal revenue product, I will always work with *output-based* conceptions of contribution—conceptions that can be thought of as trying to capture what we mean when we refer to the "fruits" of a worker's labor. This is in part because they are the ones that pose an inegalitarian threat. It is trivial to show that reward according to an *input-based* conception of contribution—like effort—can generate relatively egalitarian verdicts. That is not my goal.

this conception of contribution, the above answer implies that the contribution of low-wage workers taken together is roughly equal to all of global output.

But the same is presumably true of the other half of the global income distribution, the high-wage workers. Without them, output would likewise fall to zero, or near enough. In this sense the two halves of the global economy contribute roughly equally. This is what I will call, in what follows, "the simple observation": the observation that both halves of the global economy make a difference roughly equal to all of output, and in that sense contribute roughly equally.

Philosophers may be wondering what we need to read into the antecedents of the relevant counterfactuals ("If they stopped working...") in order to vindicate them. And economists may be wondering whether these are claims about the short term or the long term. (These two, we will see, are related.) Everyone may be wondering why we are drawing our line down the middle of the income distribution, as opposed to somewhere else. I will explain, later on, how I think the simple observation needs to be interpreted, and why the arbitrariness of its dividing line is not a problem. I will also explain the sense in which the simple observation is a ladder that we will, after climbing, kick away.

For now, note that we reach the same result as above even in an idealized version of the actual global economy, a perfect free market for labor in which each worker is paid according to their marginal revenue product, per the neoclassical theory of wages. In such an economy, the same claims hold: the economy would grind to a halt without either of its halves.

I note this because it is in an important way puzzling. If each worker is paid according to their marginal revenue product, then low-wage workers must by definition contribute—in just that sense—less than high-wage workers. How is it possible, then, that the low-wage workers as a group contribute just as much as the high-wage workers as a group? It is because in complex economies groups of workers often together contribute dramatically more than the sum of what they contribute as individuals.

Indeed this is the basis of my own recent argument (Behrle forthcoming) against the individualistic version of the Contribution Principle—reward according to individual contribution. I argue that the principle grants workers more credit for their individual contributions than they can plausibly claim, because it is "blind" to the dependence of these contributions on what other workers "only together" do, that is, on the latter's collective contri-

butions. (This argument is one entry in a long-running attempt to identify the role that "society" plays in workers' contributions, and the normative significance thereof.[8]) Put differently, reward according to individual contribution registers collective contributions, but in the wrong way: it smuggles the achievements of large groups of (often low-wage) workers into the individual contributions that the groups' achievements make possible. Here is an illustration. If the individual contribution of some white-collar professional depends on, say, a single highway maintenance worker, then that dependence will show up in the latter's market-recognized contribution: enabling the white-collar worker to make a big difference to output is itself to make a big difference to output. But if that white-collar worker depends on what highway maintenance workers only together do, meaning that those workers make a difference together that is bigger than the sum of the differences they make individually, then that dependence will not fully show up in the latters' contributions. Given a scheme of reward according to individual contribution, their achievement enriches not them but those who depend on them.

In this paper, then, I assume that the individualistic version of the Contribution Principle has already been taken off the table. The question I ask in this paper follows on the heels of this dismissal: What happens to the principle once we shift from the level of the individual to the level of the collective? It is the answer to this question that is transformed by the distinction between causation and counterfactual dependence.

2   Slavery and Causation

I now turn to the debate about the contribution that enslaved labor made to the American economy. I am going to extract from this debate a lesson about the relationship between *replaceability* and causation, and thus causal productive contributions. In the next section, I will show that this lesson underlies the simple observation. To anticipate: a worker's causal contribution is given by the difference they make *barring their replacement*; and it is only with this condition that the low- and high-wage workers contribute equally.

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[8]For a partial overview see Lister 2025.

2.1 Introducing the Debate

In 2011, there was a conference convened by Brown and Harvard that inaugurated the New History of Capitalism. The first sentence of Sven Beckert and Seth Rockman's introduction to the conference volume, *Slavery's Capitalism*, reads as follows: "During the eighty years between the American Revolution and the Civil War, slavery was *indispensable to the economic development of the United States*."[9] Claims like this are central to the New History. They appear in many of its constituent texts. Here is Edward Baptist, for example, in *The Half Has Never Been Told*: "... the commodification and suffering and forced labor of African Americans is what made the United States powerful and rich."[10] It is claims like these that the cliometricians take themselves to deny. That is our debate.

This debate is morally charged in a way that might seem surprising. It might seem surprising because it is not clear what normative issues turn on the question of slavery's economic consequences. The New Historians seem to have two issues in mind. The first is about capitalism: if slavery was important for capitalism's development, at least in the United States, then that might tell us something normatively important about capitalism, at least in the United States.[11] The second is about enslaved people themselves: if their labor made America rich, this would seem to count in favor of the claim that their descendants are owed reparations.[12] I set the first of these two ideas aside. But, as we will see, the way in which I think we should interpret away the debate between the New Historians and the cliometricians is one that

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[9]Beckert and Rockman 2016: 1, emphasis mine.

[10]Baptist 2014: xxi. For other examples, see Baptist 2014: xxiii, xxvi, 3–4, 33, 113, 128, 229, 311, 312, 316, 319, 350, 385, 407–8, 411, 413; Baptist 2016: 32–3, 41; Schermerhorn 2016: 211; Shankman 2016: 244; Brophy 2016: 263; Martin 2016: 119.

[11]Thus the title of Matthew Desmond's (2019) New-History-inspired contribution to the *New York Times'* "1619 Project": "If you want to understand the brutality of American capitalism, you have to start on the plantation."

[12]Baptist (2014: xix): "If slavery was outside of US history...—if indeed it was a drag and not a rocket booster to American economic growth—then slavery was not implicated in US growth, success, power, and wealth. Therefore none of the of the massive quantities of wealth and treasure piled by that economic growth is owed to African Americans." To anticipate what I say in Section 3: I do not think that this inference survives reflection. It seems to imply that, if a lazy but talented capitalist hires a worker to produce something of value, and if in that worker's absence the capitalist would have produced it more efficiently, then the worker is owed no share of the value of what they produce. That is a bizarre view. (Thanks to Daniel Viehoff for this example.)

leaves space for the second.

The New Historians identify several mechanisms by which slavery made the United States rich. Beckert and Rockman mention four in their summary:

> [1] Slave-grown cotton was the most valuable export of the United States and [2] one of the few American-made goods that attracted specie [i.e., non-paper money] into the nation's financial system. [3] Cotton also offered a reason for entrepreneurs and inventors to build manufactories in such place as Lowell, Pawtucket, and Paterson, thereby connecting New England's Industrial Revolution to the advancing plantation frontier of the Deep South. [4] And financing cotton growing, as well as marketing and transporting the crop, was a source of great wealth for the nation's merchants and bankers. (Beckert and Rockman 2016: 26)

For simplicity, I am going to focus on versions of the first and third claims, though what I say applies to the others, not least because they are causally downstream of the first. In particular, I focus on these simple versions of the first and third claims:

COTTON Slavery was important for the production of cotton, which was very valuable.

INDUSTRY Slave-grown cotton was important for the production of cotton textiles in New England, which was important for America's industrialization.

Let me say more about what I do not discuss. I confine myself to the United States. So I not discuss the claim, most associated with then-future Trinidadian leader Eric Williams' 1944 *Capitalism and Slavery*, that slavery was essential to the Industrial Revolution in England, to which cliometricians are somewhat more receptive.[13] Nor do I discuss the possible dependence of

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[13]There is a large literature about this, the first half of the "Williams thesis." See, e.g., Darity 1982; Solow and Engerman 1987; Findlay 1990; Findlay and O'Rourke 2007, ch. 6; Inikori 2002; Acemoglu et al. 2005; Blackburn 2011, ch. 4; and Hudson 2014. For a summary discussion that helpfully contrasts cliometricians' attitudes toward the first half of the Williams thesis with their attitudes toward the New Historians' analogous claim about American economic development, see Wright 2020.

America's economic development on slavery in places outside of the United States (e.g., via New England's trade with the slave-based West Indian "sugar islands"[14]). In addition, the debate that I focus on—about whether enslaved labor made America rich—is distinct from the debate about whether slave-based cotton production was "efficient," the modern iteration of which was initiated by Robert Fogel and Stanley Engerman's controversial 1974 book *Time on the Cross*.[15] It is neither necessary nor sufficient for the claim that enslaved labor made America rich that slave-based cotton production was "efficient" in any of the senses at play in that debate.[16]

Back to the debate at hand. The cliometricians seem to deny COTTON and INDUSTRY. Here is a summary statement from Gavin Wright:

> Did slavery play a primary and indispensable role in the rise of the US economy to world preeminence? This proposition has deep historical roots: Pro-slavery apologists argued that "slavery was the nursing mother of the prosperity of the North".... Karl Marx wrote in 1846 that "without slavery there would be no cotton, without cotton there would be no modern industry"... More recently, claims about the centrality of slavery to nineteenth-century US economic growth have featured in the national conversation on race, perhaps most notably in an intellectual insurgency known as the New History of Capitalism, some of which has filtered into the popular press through channels like the Pulitzer Prize-winning "1619 Project" published by the New York Times

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[14]Bailey 1986, 1990; Kimball 2016. If the first half of the Williams thesis is true, then American economic development also depended on enslaved labor in the West Indies to whatever extent it depended on the Industrial Revolution in England, as Wright (2006: 123) notes.

[15]There is also a large literature about this debate. To get a sense of why many of Fogel and Engerman's claims were rejected at the time, see David 1976. For recent evidence that bears on the debate, see Bleakley and Rhode 2024a and 2024b.

[16]Regarding necessity: Suppose that (a) slave-based cotton production was less efficient (in any sense) than free-labor-based cotton production would have been, but that (b) free labor could not have been induced to produce cotton in the United States before 1861 (on which see note 17). The latter might be enough for slavery to have been indispensable for American prosperity despite the former. See generally Wright's distinction between slavery as a production process and as a system of property rights (2006: 20–7). Regarding sufficiency: flip the situaiton. Suppose that (c) slave-based production was more efficient but (d) total cotton production would have been much higher with a free labor force, because that labor would have been more elastically supplied (see below).

(2019). Yet this proposition has been rejected by virtually every economic historian [i.e., cliometrician] who has examined the issue. (Wright 2022: 123-4)

Why do the cliometricians deny that slavery was indispensable for the prouction of cotton? Because they believe that, in the absence of slavery, cotton would have been produced in the South by non-enslaved workers—"free labor"—*just like it was after the Civil War*.[17] Indeed Wright argues that a counterfactual free-labor-based South would have produced *more* cotton, in part because the supply of enslaved labor was relatively inelastic after the closing of the Atlantic slave trade in 1807.[18]

Why do the cliometricians deny that slave-grown cotton was indispensable for cotton textile production? One reason follows from the previous: if enslaved labor was not necessary for domestic cotton production, then it was not necesary for the cotton textiles that used domestic cotton. But Wright

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[17]Commenting on Beckert's acknowledgment that American cotton production rebounded after the Civil War, Wright writes, "He does not seem to notice that [this acknowledgment] undermine[s] the previous 300 pages of his book" (Wright 2020: 372). (See also Majewski 2019 and Olmstead and Rhode 2018: 6.) At first glance this is an overstatement. The rebounding of cotton production after the Civil War is not enough to show that production earlier in the century did not counterfactually depend on slavery, which is what Wright takes Beckert to be claiming in "the previous 300 pages of his book." Cotton was produced after the Civil War in part *by former slaves*. So it is open to Beckert to observe that the size of the free labor force produced by the emancipation of an enslaved labor force is not a good guide to the size of the free labor force that would have been assembled earlier via immigration. Indeed this is one of the main ideas in Beckert's book— the idea that, before certain infrastructural, technological, and legal changes, slavery was the only mechanism for "the mobilization of very large numbers of workers on very short notice" (91; see also Findlay and O'Rourke 2007: 342 and Findlay 1990: 14). I find this idea difficult to evaluate, because we never get a canonical list of the relevant changes. But, in any case, we have to read Wright's criticism of Beckert in light of Wright's other work, and his other work suggests that he is skeptical of this claim; see his discussion of the North's superiority in attracting immigrants in Wright 1978: ch. 4 and Wright 2006: 32–4, 57–8 (and see the next sentence in the main text). For population data see Bleakley and Rhode 2024b: Figure 1.

[18]Wright 2020: 370. There are other reasons given. For example, slave-based Southern farms plausibly underspecialized in cotton, growing food alongsde cotton rather than purchasing it. This was because they were trying to expropriate the maximum value from enslaved laborers, which meant coming up with other agrictural work to do during cotton production's seasonal nadirs. In the jargon, slavery made agriculture more of a *fixed-cost* enterprise. Wright 2020: 370; Gallman 1970; Anderson and Gallman 1977; Lindstrom 1970; cf. North 1961: 67–8, 101–2, 128–9, 140–1.

suggests, in addition, that in the absence of domestic cotton New England's mills simply would have sourced it from elsewhere.[19] John Majewski (2019) argues, separately, that the production of cotton textiles was itself not necessary for the North's industrialization: he rejects the historians' implicit "leading-sector" hypothesis.

The cliometricians also argue that slavery was in other ways actively bad for the American economy, either because: the economic inequality it generated led the South to develop various bad institutions;[20] and/or it reduced investment in physical capital—e.g., roads, schools, factories, and so on;[21] and/or it stood in the way of the kind of ongoing technological innovation that powered the "Schumpeterian" North.[22]

So, to restate, the cliometricians argue that slavery was not indispensable for cotton production and that slave-based domestic cotton production was not indispensable for the production of cotton textiles, or industrialization. In this sense they seem to deny COTTON and INDUSTRY. And they argue that slavery otherwise held economic development back. From all of this the cliometricians conclude that, had the United States abolished slavery earlier, it would have become just as rich, if not richer.

I want to argue that the cliometricians and the New Historians are, despite appearances, to some extent talking past another. I do not deny the three cliometric claims just mentioned, nor the concluding inference, which I am in any case not qualified to do. I suggest instead that these three claims are compatible with the following interpretation of COTTON and INDUSTRY: enslaved people were *causally responsible* for cotton production, and for cotton textile production. And so they were partly causally responsible for America's prosperity.

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[19] "As a bulky but lightweight commodity, raw cotton travels easily, and transportation costs play little if any role in textiles geography" (Wright 2020: 375). One might worry that the claim is a little quick, at least for the period after the cotton tarriff was lowered in 1846, when American prices for American and British cotton textiles were very similar (Harley 1992, table 1).

[20] This is the "Engerman-Sokoloff Hypothesis." See Engerman and Sokoloff 1997. Cf. Nunn 2008; Acemoglu et al. 2008.

[21] Ransom and Sutch 1988, esp. 139–40; Wright 2006: 61. For related points, see the second thesis of Wright 1978: ch. 4.

[22] Majewski 2019.

2.2 An Orthodoxy

This compatibility follows from an orthodoxy within philosophy, one with almost no dissenters:[23] counterfactual dependence is not necessary for causation; effects need not counterfactually depend on their causes.

This is the lesson of cases of *redundant* causation. Consider the following stock example.[24] Suzy and Billy are throwing rocks at a glass bottle. Eventually Suzy hits it; the bottle shatters. As it happens, though, had she not thrown her rock, Billy would have hit the bottle with his. Here we have causation without apparent counterfactual dependence of effect on cause: Suzy's throw caused the bottle to shatter, but Suzy does not seem to make a difference to the bottle shattering; had she not thrown the rock, it still would have shattered. The literature has dubbed the particular kind of redundant causation on display in this case *preemption*, because Suzy preempts Billy, her would-be replacement.

The lesson is not that causation and counterfactual dependence are unrelated. Indeed counterfactual theories of causation, which make sense of causation partly in terms of counterfactual dependence (without making the mistake of deeming them equivalent), are popular within contemporary philosophy. In cases of preemption, for example, we can still find a kind of counterfactual dependence: the shattering depends on Suzy *holding Billy's inaction fixed.* Most counterfactual theories of causation accommodate cases of preemption by making use of something like this fact.[25] As Brad Weslake puts it, the dependence of effect on redundant cause is thereby *unmasked.*[26] This common approach is the one that I adopt below.

2.3 The Debate in Light of the Orthodoxy

The New Historians will sometimes present their claims like this:

> ... *in actual historical fact* there was no nineteenth-century capitalism without slavery.[27]

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[23]But see Northcott 2021.

[24]Lewis 2000: 184. According to Hitchcock (2013: 131 n. 4), the example originated with a draft of Hall 2004 before it appeared in Lewis's paper.

[25]Yablo 2002, 2004; Hitchcock 2001; Woodward 2003; Halpern and Pearl 2005; Weslake 2015. Cf. Lewis 1973a: 567; Gallow 2021: 68–70; Lewis 1987: 203–7.

[26]Weslake 2015.

[27]Johnson 2013: 254, emphasis mine.

> ... the North's forms of entrepreneurship, innovation, and market competition [invite] the counterfactual claim that the American economic takeoff could have happened without slavery. *Perhaps it might have, but the fact remains that it didn't.*[28]

Eric Hilt, a cliometrician, criticizes this focus on actuality:

> Many historians apparently have a strong distaste for counterfactual histories.... Yet the reason economic historians think about counterfactuals is not due to an interest in specifying alternative histories. Rather, it is because all statements about causal relationships contain counterfactuals. To say that the gold standard caused the Great Depression is to say that absent the gold standard, the Great Depression would not have happened; these two statements are equivalent.[29]

But, per the orthodoxy, Hilt's final claim is false.[30] Counterfactual dependence is not necessary for causation, and so not necessary and sufficient, and so counterfactual dependence claims are not equivalent to causal claims, materially or otherwise. The mooted truth of the cliometricians' counterfactual claims—that slavery was not indispensable for the production of cotton or cotton textiles—does not establish that enslaved people did not *cause* America to become rich, even though, as Hilt implies, it is with an eye to causal claims that the cliometricians advance their counterfactual ones.

To make this vivid, consider these two pairs of claims. The first pair:

(a) In the first half of the nineteenth century, almost all of the cotton in the United States was produced by enslaved people—people who were in the United States because of the institution of slavery.[31]

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[28]Beckert and Rockman 2016: 3, emphasis mine.

[29]Hilt 2017: 529.

[30]It may be that we should not take Hilt literally here, since this philosophical orthodoxy is, as I noted, at least implicit in some of the now-standard methods of causal inference. Indeed the theories of causation within philosophy that offer the most sophisticated accounts of the (non-identity) relationship between causation and counterfactual dependence *descend from early econometrics*, like Haavelmo 1944. See Woodward 2003: 39.

[31]Why the last phrase? Consider: even if all of the wheat in the United States was produced by (say) fans of vaudeville music, this would not show that vaudeville music was causally important to wheat production. (Thanks to Cian Dorr for this example.) The point here is that these workers being enslaved is not incidental to their contributing. From now on, I leave the addendum implicit.

(b) Had the United States never allowed chattel slavery, or had it abolished slavery earlier, (at least as much) cotton still would have been produced.

The second pair:

(c) The production of cotton textiles in New England, which helped industrialize the North, used slave-grown cotton.

(d) If these mills hadn't used slave-grown cotton, they would have gotten cotton from elsewhere (and/or they would have industrialized anyway).

(a) is one disambiguation—a causal disambiguation—of COTTON. And it is consistent with (b): (b) is the denial of a distinct, counterfactual disambiguation of COTTON. Likewise, (c) is a causal disambiguation of INDUSTRY, and it is consistent with (d), which is the denial of a distinct, counterfactual disambiguation of INDUSTRY. This consistency is the hallmark of cases of preemption.

(a) and (c) are together sufficient for the conclusion that enslaved people were important for America's nineteenth-century prosperity in the sense that they were partly causally responsible for it. It is, to repeat, no objection to this conclusion that, per (b) and (d), this prosperity did not counterfactually depend on their labor.[32]

Recall one of the claim's from Wright's summary, that "slavery was the nursing mother of the prosperity of the North." The cliometricians in effect argue that slavery did not *have to be* the nursing mother of the prosperity of the North. But this is consistent with the observation that slavery *was* the nursing mother of the prosperity of the North. And that is the observation that I am interpreting the New Historians as making.

It is worth being explicit about how the standard treatment of preemption cases vindicates this causal claim. As I noted above, in these cases we do not evaluate candidate causes by seeing whether they make a difference. We standardly evaluate them by seeing whether they make a difference while—as a first pass—*holding fixed everything but the candidate cause and the effect.*

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[32]Lewis (2000: 195): "... I think I am doing what historians do. They trace causal chains, and, without more ado, they conclude that what comes at the end of the chain was caused by what went before. If they did not, they could say little about historical causation; because, over intervals of any length, historical counterfactuals become so very speculative that nothing much can be known about the dependence of any event on its causal ancestors."

(Think of a controlled experiment, where we isolate and change only one factor at a time.[33]) It should be uncontroversial that, holding other workers' labor activity fixed, enslaved labor made a very large difference to economic output.[34]

In the Appendix, I say more about the italicized phrase in the previous paragraph. Different counterfactual theories of causation offer different answers to the question of what exactly we hold fixed, and at what states, when evaluating candidate causes. I use a structural equations model to map the counterfactual dependence relations that the cliometricians argue for and then use this model to show that, on any of these counterfactual theories of causation, enslaved labor was a cause of America's prosperity. But the important point is not that these theories generate this verdict. This is because we can see in the absence of any theory that the verdict is true. A condition of adequacy for a counterfactual theory of causation is that it respect our intuitions about cases with this structure—that is, cases of preemption.[35]

The case of enslaved labor in the United States is not alone in display-

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[33]This is perhaps the central motivating paradigm of contemporary "interventionist" counterfactual theories of causation, like most of those referenced in note 25: see, e.g., Woodward 2003: 34–5.

[34]Olmstead and Rhode (2018: 13) take Baptist to task for making a classic "double-counting error" when calculating the value of cotton for the American economy (Baptist 2014: 321–2; see also Majewski 2019). This is the error of adding the value of an input to the value of what is made with it. Because the value of an output already includes the value of its inputs, adding the value of its inputs separately is to double count that value. But note that the "value-added" framework within which double-counting is an error is not a causal one, and not the one that Baptist seems to be using (note the *separate* reference to "value added" later on p. 322); the causal contribution of any necessary component of a supply chain *is* equal to the value of the final good or service, that is, the value of the entire supply chain. Of course this means that the contributions will sum to more than this value, but that is not an objection, despite what Olmstead and Rhode assert in *ibid.* (See the discussion of the pie fallacy below.)

[35]I do not mean to imply that the entire debate is thus dissolved. (Thanks to Taylor Jaworski for pressing me to clarify this.) There remain many points of disagreement. One especially stark point of disagreement concerns whether increases in cotton productivity are attributable to innovations in torture based on an individual quota system, as Baptist claims, or to innovations in biology, per Olmstead and Rhode 2008a, 2008b, 2011. Baptist's main argument against the biological innovation claim is that the evidence for it is better explained by the individual quota system (Baptist 2016: pp 314–15, n. 36, and see 2014: 127 and 2016: 42–3), while the proponents of the biological innovation claim argue that this system literally did not exist (Olmstead and Rhode 2018: 9–11; cf. Rosenthal 2016: 74).

ing this structure. We find it across complex economies, and their histories. Consider a country suffering from a *resource curse*.[36] Even if it is true that the resource was a curse—that, in its absence, output per capita would have been higher—the workers who pulled it out of the ground are partly causally responsible for something valuable. We would not say to them that they are not owed a share of this value because it turned out to be a curse rather than a blessing.

3   Back to the Simple Observation

I now want to bring the previous two sections together, and to say more about how I understand the simple observation from Section 1. In particular I will: (a) explain that the simple observation is only plausible if interpreted in causal, rather than simple counterfactual, terms; (b) argue that this not an objection to but rather the source of its normative significance; and (c) say what I take its normative significance to be.

3.1   The Simple Observation Is an Observation about Causation

In the previous section I argued that the debate between the New Historians and the cliometricians is partly dissolved by the distinction between causation and mere counterfactual dependence. In characterizing this distinction, I noted that replaceability is relevant to the latter but not the former.

Earlier, in Section 1, I claimed that, if the global economy's low-wage workers stopped working, output would fall to zero, and likewise for its high-wage workers. This is the simple observation. In making this observation I was relying on an unstated presupposition. Here it is made explicit: if low-wage workers or high-wage workers stopped working, *and if other workers' labor activity were held fixed*, such that the workers in question were not replaced, then output would fall to zero.[37] Note how this short-circuits the question of whether the simple observation is about the short- or long-term. This distinction is important, when it is, in part because rearrangement and

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[36]See Sachs and Warner 2001 for an overview.

[37]What I mean is: if other labor activity not on a *causal path* from candidate cause to effect were held fixed. See the Appendix.

replacement take time. But here, in order to identify causation, we are stipulating rearrangement and replacement away.

It is the barring of replacement that drives the result that the low- and high-wage workers contribute equally. To see this, consider Robert Nozick's well-known suggestion that low-wage workers in an idealized market economy would do worse on their own than high-wage workers, and in that sense gain more from cooperation.[38] Nozick's suggestion seems to amount to the claim that the low-wage workers contribute less than the high-wage workers: if the high-wage workers do better in the absence of the low-wage workers than vice versa, then the high-wage workers make a bigger difference to output. In other words:

$$\text{(actual output} - \text{counterfactual output without high-wage workers)} >$$
$$\text{(actual output} - \text{counterfactual output without low-wage workers)}$$

But Nozick is talking about what would happen if one of these groups left the cooperative venture. The simple observation, by contrast, is about what would happen if they left *and their labor were not replaced.* It is this difference that explains why the latter, but not the former, is about *causal* contribution, and why the latter, but not the former, leads to an egalitarian result.[39]

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[38]Nozick 1974: 193–4. Nozick actually talks about the "better endowed" and "worse endowed," but the basic idea is the same when considering an idealized market economy; see the first footnote on p. 194.

[39]Nozick's suggestion is offered specifically as a criticism of John Rawls's reciprocity-based defense of his *difference principle.* But the general framework of that suggestion is a familiar one. It is basically a bargaining framework. Beyond Rawls himself, where it makes a somewhat muted appearance, it shows up in many places: for example, in David Gauthier's Hobbesian contractualism (1986), in Thomas Nagel's contractualist account of political legitimacy (1991), and in John Roemer's game-theoretic conception of exploitation (1982, 1996, 2017). Political philosophers are for this reason primed to think about difference-making in the way that Nozick does, that is, in a way that does not hold fixed preempted replacements. So it is easy to overlook the egalitarian implications of the use of more complex counterfactuals in theories of causation. Note that, in saying that arguments like Nozick's prime political philosophers to think in simple counterfactual terms, that is all that I am saying. I am not making the stronger claim, which I do not accept, that arguments like Nozick's should not be couched in those terms. An argument about who benefits to what extent from a cooperative scheme *should* be conducted with reference to simple counterfactuals; but what this highlights is that the question of benefit is distinct from the question of causal contribution. Thanks to Daniel Viehoff for pressing me to clarify this.

3.2 Why Care about Causal Contribution?

Call the difference that a group makes to output their counterfactual contribution. Call the difference that they make to output holding other workers' labor activity fixed their causal contribution, as I did above.[40] The difference between the simple observation and Nozick's claim illustrates the fact, already operative in the discussion of the debate about slavery, that a group's causal and counterfactual contributions can differ dramatically.

So: the simple observation is an observation about causal contributions; and it is because contribution is understood in causal terms that the simple observation has its egalitarian cast, with each group contributing equally.

Why care about the simple observation? Should we care about what groups *causally* contribute, as opposed to what they contribute in a merely counterfactual sense? Is our intuitive attraction to the principle of reward according to contribution an attraction to the principle of reward according to *causal* contribution? The distinction between causal and counterfactual contribution invites these questions, and it does not on its own answer them.

An initial piece of evidence that we care about causal contribution comes from the debate about slavery, which is part of the reason I introduced it. Consider the claim that among slavery's many evils is the fact that enslaved people were denied the value of the fruits of their labor: as W. E. B. Du Bois puts it, "Great and significant as was the contribution of black labor to the seventeenth, eighteenth, and nineteenth centuries, its compensation approached zero."[41] As we have seen, the claim that enslaved people's contribution was "great" is, if the cliometricians are right, plausible only when contribution is understood in causal rather than simple counterfactual terms. But this is itself evidence that this is how "contribution" ought to be understood in the context of a claim about what enslaved people deserved on the basis of what they contributed. The fact that enslaved people produced something very valuable but were paid almost nothing beyond the in-kind provision of what was required for their survival seems by itself to show that they did not get what they deserved, a wrong distinct from their being held

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[40]Causal contribution can be positive along one pathway and negative along another: think of labor that produces both a valuable good and toxic pollution. So by causal contribution I really mean the net of a worker's causal contributions. This is relevant to the question of whether slavery, as distinct from enslaved laborers, contributed to American prosperity: see the end of the Appendix.

[41]Du Bois 2007 (1939).

in bondage and subject to torture. We do not need to know whether cotton production counterfactually depended on their labor, that is, whether free labor would have produced cotton in their absence. In the same vein, to the extent that facts about economic contribution are marshalled to support reparations, it should be facts about causal contribution.[42]

I said that the debate about slavery provides an "initial" piece of evidence. This is in part because some philosophers will worry that the real-world case of slavery is too complex to elicit an intuition about the principle of reward according to contribution. Consider, then, this simpler minimal pair:

Tool 1 A worker in a self-sufficient agricultural community makes a tool, only one of which the community needs, using resources equally available to everyone else. The worker is the only one who can make this kind of tool.

Tool 2 As before, but now the worker is one of several who can make this kind of tool. If they do not make it, someone else will.

In both cases, the worker produces a tool. But only in the first case does the worker make a difference that matters. Does this latter fact mean that the worker makes different productive contributions in the two cases, in the sense of "productive contribution" relevant for what they deserve?

To answer this question it is helpful to decompose it into two. First: Is a worker's causal contribution relevant to what they deserve? Second: Is a worker's counterfactual contribution relevant to what they deserve? Four combinations of answers are possible:

		Counterfactual	
		Relevant	Irrelevant
Causal	Relevant	Ecumenism	Productivism
	Irrelevant	Subjunctivism	*n/a*

We are assuming the truth of the Contribution Principle. So we can set aside the bottom right cell, the view that neither causal nor counterfactual

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[42]As the "to the extent that..." clause of this sentence is meant to suggest, an appeal to contribution is not necessary for a successful argument for reparations. Nor is it sufficient, since arguments for reparations of the relevant form need both to identify the reparative entitlements of enslaved people and to explain how those entitlements get passed to one's descendants. The principle of reward according to contribution can help only with the first.

contribution matters.[43]

Productivism is the view that causal contribution matters and counterfactual contribution does not: what matters is who actually produced what. *Subjunctivism* is the converse: what matters is who made what difference.

Tool 1 and Tool 2 are evidence against Subjunctivism. Subjunctivism says that, in Tool 2, the worker does not contribute at all; they do not deserve anything on the basis of a contribution. (It says the same about enslaved labor in the antebellum South, if the cliometricians' counterfactual claim is true.) That seems to me bizarre. If a worker labors to make a tool, and the tool is put to use by their community, it is hard for me to see how it could be true that they contribute nothing, in the sense of "contribute" relevant for what they deserve.

For those who do not share this intuition, let me draw out an odd downstream consequence of Subjectivism's verdict. Subjectivism implies that, in Tool 2, *no one* deserves reward for the tool. The main worker does not, because their tool-making does not make a difference; but of course their would-be replacements do not make a difference by making a tool either, since, first, they do not make a tool at all, and, for good measure, even had they made the tool, we can suppose that someone else would have had they not. This, again, seems to me bizarre. How can it be true that a tool has been made but no one has contributed anything? The Contribution Principle is a principle for governing the distribution of what we produce. It would seem unfit for its function if it rendered the verdict that much of what has been produced—everything produced in an average, "replacement-level" way—does not actually count as a productive contribution.

My own intuitive reaction to this minimal pair leads me to Productivism: my reaction is that the worker makes the same contribution in Tool 1 and 2. What they contribute is the value of the tool, where that value is itself understood in causal terms—a function of the causal consequences of what is done with it. (I am deliberately not taking a stand on which kinds of consequences are relevant.)

Given the implausibility of Subjectivism, the main rival to Productivism is Ecumenism, according to which both causal and counterfactual contribu-

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[43]More precisely: we are assuming the truth of the Contribution Principle on some output-based conception of contribution. See note 7. If one accepted an input-based conception of contribution, like effort or labor time, one could deny the relevance of the kinds of causal and counterfactual contributions at issue here while still accepting the Contribution Principle.

tions matter. There will be many versions of Ecumenism. To say that both causal and counterfactual contributions matter for what a worker deserves is not to say how much, or in what ways, they matter. One might matter more than the other. We might sum the two kinds of contribution, or instead take their product. I am doubtful that our intuitions are fine-grained enough to adjudicate between the various possibilities, and in any case for present purposes the differences do not matter. We need only work with directional verdicts.

For example: Unlike Subjunctivism, Ecumenism does not say that the worker contributes nothing in Tool 2. It says merely that they contribute less than in Tool 1. In Tool 1, the worker makes a positive causal contribution and a positive counterfactual contribution. In Tool 2, they make the same causal contribution but no counterfactual contribution. So any sensible version of Ecumenism will render the verdict that the worker contributes less in Tool 2 than in Tool 1.[44] That verdict still seems to me counterintuitive, but not everyone shares that reaction; and at a minimum it is less counterintuitive than the verdict rendered by Subjunctivism.

Ecumenism seems to gain more positive support from cases like this one:

Tool 3 As before, but this time the worker who makes the tool knows that they will make a worse tool than those whom they preempt, and in doing so will use up the resources needed to make it—so that no superior replacement can be made.

Many of us will have the intuition that the worker in Tool 3 deserves less than the worker in Tool 1 or 2. Ecumenism offers a straightforward explanation of that intuition: In Tool 3, the worker's counterfactual contribution is negative. However exactly we are meant to combine that with their positive causal contribution, the end result will be smaller than if their counterfactual contribution had been positive, as in Tool 1, or zero, as in Tool 2.

But an alternative explanation of this intuition is available, one that makes use of only causal facts. In cases of preemption, the preemptor is causally responsible for the outcome of interest (the bottle's shattering, the tool), but they are also causally responsible for the preemption itself—the

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[44]By "sensible" I mean: any version on which a worker's deservingness is a *positive* function of their causal and counterfactual contribution. There will be versions of Ecumenism according to which one of the kinds of contribution counts *against* a worker's deservingness, but these are not normatively live options—just dead trees in the conceptual landscape.

inactivity of the preempted backup. In some cases, this preemption is itself morally wrong. And it is plausible that this undercuts the person's desert claim—a claim that, on the present view, they would have had on the basis of their causally contributing the outcome of interest. For example: It is presumably wrong to deprive an expert tool-maker of tool-making materials when your community is in need of a tool and would benefit from its being expertly made. According to this explanation, the reason for which the worker in Tool 3 is less deserving is not that their making of the tool amounted to a smaller productive contribution but that there was something defective about how they came to make the contribution that they did—because of what else they caused along the way.

To be clear, Ecumenism need not deny this alternative explanation. Ecumenism agrees that causal contribution matters, and this alternative explanation simply highlights another kind of causal contribution. But the alternative explanation nonetheless weakenes the case for Ecumenism, because it shows that we do not need to invoke Ecumenism to explain our intuitive reaction to Tool 3.

The alternative explanation has the minor advantage of additionally explaining our reaction to cases like the following. For reasons of nepotism, a worker gets hired ahead of the person who would have otherwise gotten the job; but the nepotistic hire does a better job than the other worker would have. To consider counterfactual contribution here is to judge this worker more, not less, deserving. But clearly the worker's claim is undermined by the fact that they cut the line. The alternative explanation of our reaction to Tool 3 explains this undermining, and in the same way that it explains our reaction to Tool 3.

We have reached something of a standoff. Let me review. Our reaction to the original minimal pair, Tool 1 and 2, is evidence against Subjunctivism. This leaves us with Productivism and Ecumenism. In my own view Ecumenism, likes Subjunctivism, generates a counterintuitive verdict in Tool 2, but as I acknowledged not everyone will agree. Ecumenism seems to gain support from our reaction to cases like Tool 3, but in fact that reaction can be explained in wholly causal, productivist terms. The latter kind of explanation has the advantage of being able to explain our reactions to other kinds of cases, but that advantage does not seem decisive.

If we take a step back from this case-based abductive reasoning, though, we find a theoretical consideration that tells in favor of Productivism. Why do we distinguish causation from mere counterfactual dependence in the

first place? Part of the answer seems to be precisely our concern to make backward-looking judgments about responsibility and deservingness. In a forward-looking context, when deciding what to do, we tend to care about what will or will not happen if we do or do not act, which is to say that we tend to care about counterfactual dependence.[45] But in a backward-looking context, when rendering judgments of responsibility and deservinginess, we seem to care about who caused what; this seems to be part of what our notion of causation is *for*.[46] In this light, Ecumenism appears unstable. It acknowledges the normative significance of causal contribution. But if causal contribution is worth distinguishing from merely counterfactual contribution in part for the purpose of making backward-looking judgments of responsibility and deservingness, why would we look to *both* to determine a worker's claim to reward? In light of this theoretical role for our notion of causa-

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[45]Hitchcock 2015: 306–7, Hitchcock 2013. This is the basis of the recent debate about whether what has been called "causal" decision theory is really "counterfactual" decision theory. Ibid.; Hedden 2023; Gallow 2024. I do not think of the claim that "we tend to care about what will or will not happen" as incompatible with the central interventionist thesis that the point of causal knowledge is to furnish us with what we need to *intervene* in the world. We often identify simple counterfactual dependencies *via* causal reasoning: Suzy knows that her rock can cause the window to shatter, but also that her not throwing will cause Billy to throw his rock, which can itself cause the window to shatter.

[46]Recent work in social psychology, from Sarah A. Wu and Tobias Gerstenberg (2024), might be thought to challenge this received view, or at least the orthodox distinction between causation and counterfactual dependence on which it relies, where replaceability is irrelevant to the former. Wu and Gerstenberg present subjects with several different versions of a case like this: a carpenter, a blacksmith, and a tailor together build a ship; labor of each type is necessary for the construction; but there are different numbers of replacements available for each type of worker. Most subjects assign a worker's labor less causal responsibility for the building of the ship the greater the number of replacements available. Two comments. First, I am unsure what to make of the intuitive judgments collected in these experiments. For example, in the final version, most subjects judge a worker more causally responsible for the outcome when they had "high prior availability" for the work than when they were busy (10–13). This suggests that subjects' responses are tracking some notion of "responsibility" other than mere causal responsibility. Second, these findings are not reason to abandon the distinction between causal and counterfactual contribution (nor do Wu and Gerstenberg claim otherwise). This is because what they find is that replaceability has only a small effect on subjects' causal judgments. Even in those versions of the case where it is very likely that the original worker would, if absent, be replaced—such that they very likely make no difference—subjects' attributions of causal responsibility are only modestly diminished. That said, any sensitivity to replaceability will, in the present context, narrow the gap between causal and counterfactual contribution. Thanks to Dave Chalmers for telling me about this research.

tion, the appeal to a combination of causal and counterfactual contribution is awkward enough to require special explanation.

I cannot think of what this explanation would be. And so for the remainder of the paper I will assume the truth of Productivism: I will assume that the Contribution Principle is to be understood in causal terms. Readers who instead accept Ecumenism can treat the below as explicating only one half of the story about what workers deserve on the basis of their contributions.

3.3 The Egalitarian Implication of the Simple Observation

What does it actually mean to say that the simple observation has an egalitarian implication?

The low- and high-wage workers together contribute equally. I do not take this to show that: the low-wage workers as a collective deserve economic reward equal to the economic reward that the high-wage workers as a collective deserve, on the basis of both collective contributions being equal. While the collective contributions are equal, these two collectives are not *group agents*. They are just groups—in the jargon, *unstructured* or diffuse collectives.[47] So they cannot, according to the received view, together deserve anything. Rather I take the simple observation to suggest that: individual low-wage workers deserve economic reward on the basis of what they together do, and individual high-wage workers deserve economic reward on the basis of what they together do, and the rewards in question are equal, because the collective contributions are equal.

The next section considers a serious challenge to this picture. But its starting point is what I take to be the mainstream approach to unstructured collectives. That approach says that members of an unstructured collective like *polluters* have reasons not to pollute, and can deserve blame for polluting, in ways that are connected to the harms that polluters only together generate. To be clear, this mainstream approach runs up against a serious problem, what Julia Nefsky calls *the inefficacy problem*.[48] This is the problem of explaining how individuals can have reasons for action connected to, and be rendered deserving on the basis of, an outcome to which they make no significant difference. But there are promising responses to the inefficacy

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[47]Nefsky 2019; Collins 2019.
[48]Nefsky 2019.

problem.[49] And so I assume that the problem can be solved, such that the mainstream approach, and the features of common-sense morality that it aims to capture, can be vindicated. This is, for my purposes, a crucial assumption: if the problem cannot be solved, then I do not think that anything like the simple observation has any clear implications for what workers deserve.

4 Complicating the Simple Observation

The making of the simple observation faces what might seem like a devastating objection. I drew a line down the middle of the global income distribution: low-wage workers on one side, high-wage workers on the other. But we could draw a line anywhere we like. In so doing we could generate different collectives, and, it would seem, thereby generate different conclusions about who deserves what. It is not clear that there is a non-arbitrary way to choose among these different conclusions, and so not clear that we should take any of them seriously. This is an objection, then, not to the simple observation's claim that low- and high-wage workers together contribute equally, but to the idea that this fact is normatively significant—that it can tell us who deserves what. The fact is not normatively significant, per the objection, because we could have generated different facts about collective contributions by drawing the line in a different place, and we have no reason to prefer one exercise of line-drawing over another.

I agree that we have no reason to prefer one exercise of line-drawing over another. But I want to argue that this does not cause the problem that it seems to. This is because the competing delineations do not generate different distributive conclusions. Instead we converge on the egalitarianism of the simple observation.

That conclusion, I recognize, is hard to believe. I myself reached it by accident, and with requisite incredulity. I will argue for it in two parts. I first consider distributive conclusions based on different ways of dividing the economy in two. I will then consider conclusions based on dividing the economy into more than two. By "the economy," I continue to have in mind the actual global economy. But what I say applies, like the simple observation itself, to an idealized version of the global economy, or indeed any economy that is comparably complex.

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[49]E.g., Nefsky 2017 and Lee 2022.

4.1 Different Ways of Dividing the Economy in Two

Imagine a worker who believes that workers like them contribute more and so deserve more than other workers. What should they say in response to the simple observation?

4.1.1 A Tempting Answer

Here is a tempting answer. They should say that *workers like them* could by themselves bring the economy grinding to a halt, even though they are relatively few. Suppose, for example, that the worker in question is a dockworker, and that "workers like them" means everyone whose job involves the moving of goods. Call them the shipping collective. I assume that these workers can, in fact, bring the economy grinding to a halt.[50] The same is presumably true of everyone who is not a dockworker: moving goods is only valuable if there are goods to move. But the shipping collective is a much smaller group. If the shipping collective and the "everyone else collective" contribute equally, such that output should be distributed equally between them, then the individual shipping workers are going to come out with more: their half of the economic pie needs to be distributed among fewer people.

This tempting answer rests on a mistake. What an individual deserves on the basis of being part of a collective that generates some outcome is not directly sensitive to how many other people are members of that collective. To think otherwise is to commit what Alex Kaiserman calls the *pie fallacy*, "the fallacy of thinking that there is a fixed amount of responsibility for every outcome, to be distributed among all those, if any, who are responsible for it."[51] Consider Derek Parfit's

> *The Harmless Torturers.* In the Bad Old Days, each torturer inflicted severe pain on one victim. Things have now changed. Each

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[50]Recall that in making this implicitly counterfactual claim we are imagining that these workers down tools *and are not replaced*. This is not the same possible world that partly determines their bargaining power; that is something like the *closest* world in which they down tools, which may well be one in which they are replaced, at least eventually. This is the specification of the "no agreement point." But the two worlds can be similar, and indeed *part of the point of labor unions is to make them similar*: withholding labor all together makes replacement—"crossing the picket line"—more difficult, bringing the answer to the question "What would happen if they stopped working?" closer to the answer to the question "What would happen if they stopped working and were not replaced?"

[51]Kaiserman 2021: 3598. See also Parfit 1988: 31; Northcott 2013: 3101.

of the thousand torturers presses a button, thereby turning the switch once on each of the thousand instruments. The victims suffer the same severe pain. But none of the torturers makes any victim's pain perceptibly worse. (Parfit 1984: 80)

They together do something terrible, but, apparently, no one of them makes a difference.[52] Despite making no difference, each is, intuitively, blameworthy.

Now imagine that we change this case in the following way: we double the number of torturers. This doubling does not change how intuitively blameworthy each torturer is. There is not a fixed amount of blameworthiness that needs to be distributed among them, such that doubling their number means spreading that blameworthiness thinner. The blameworthiness of each is tied up with what they together do in a way that is not directly mediated by their number.

Or consider Kaiserman's version of a familiar example: two assassins each shoot a victim, who dies; neither shot makes a difference—it is a case of symmetric overdetermination—but each was sufficient to kill the victim.[53] Because each shot was sufficient, there is one sense in which each assassin is wholly responsible for the outcome, and so deserves blame commensurate with its badness. This is to say that they may each deserve what they would have deserved had they been the only one to act. The presence of the other does not *eo ipso* diminish their responsibility.

The pie fallacy is easiest to see in the case of desert of reactive attitudes because those attitudes are neither rivalrous nor scarce. But its scope is not limited to such cases. In tort law, *joint tortfeasors*—roughly, individuals who together harm another—are each wholly liable for the harm they cause: if there are two, and one cannot pay, the whole burden falls to the other. This example is also an indication of why it can be hard to recognize the pie fallacy. In the normal case, where both tortfeasors can pay, each pays half. But we cannot infer from this that each is only liable for half the injury, as the treatment of cases in which one cannot pay makes clear.[54]

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[52]I take it this is the standard pre-theoretical reaction. It assumes that, *contra* Parfit (1984: 78–82), one can only make pain worse by making it perceptibly worse. Thanks to Cian Dorr for pressing me to be explicit about this.

[53]Kaiserman 2021: 3603.

[54]Of course I am assuming that tort law here tracks morality, which may not be the case. Thanks to Liam Murphy for correcting my understanding of joint tortfeasors. He is not liable, wholly or in part, for any remaining errors.

Now return to the shipping collective. The members of that collective each deserve economic reward commensurate with, and on the basis of, their degree of responsibility for what they together do; and likewise for each member of the everyone else collective. We cannot conclude from the mere fact that there are fewer shipping workers that each is more responsible for what they together do. That would be true if there were a fixed amount of responsibility to go around, but there is not. Of course there is a fixed amount of *output* to be distributed on the basis of this responsibility, but that does not show that the members of the shipping collective are each more responsible for output than the others.

Things would perhaps work differently if these two collectives were group agents. Each of these two group agents would plausibly deserve the same share—half—of output. That would indeed mean more for each member of the shipping collective, since there are fewer of them. But recall that these collectives are not group agents. Our question is about what individuals deserve on the basis of what they together do, not what they together deserve.

Let me review the dialectic. The objection under consideration says that different ways of dividing the economy into two generate different distributive verdicts. The paper started with an egalitarian verdict, the verdict of the simple observation. So we are considering the prospects of an inegalitarian verdict. In particular, we want to see if some members of a collective that makes all the difference to output might be more responsible for that difference than members of the complementary collective—everyone else—for their collective contribution. The lesson of the pie fallacy is that the that the size of a collective does not determine in a direct way its members' degree of responsibility for the collective's contribution. Thus we should not be tempted by the "tempting answer."

4.1.2   Better Answers That Still Do Not Work

What we need to consider instead are ways to assess degrees of responsibility directly, that is, rather than using group size as a proxy. Philosophers have in recent years proposed several of these: they have offered different measures of degrees of causal responsibility, or, as I will also put it, measures of the importance of partial causes for what they partly cause. In his survey of this literature, Kaiserman (2018) divides these measures into those that descend from the tradition of thinking of causation in terms of necessity and difference-making and those that descend from the tradition of thinking of

causation in terms of sufficiency. Following Hall's (2004) influential discussion, he terms these "dependence" and "production" measures, respectively.

There is one difficulty that needs to be addressed at the outset. These measures are measures of *causal* responsibility. But in looking at whether some members of different collectives are more important than others, we are looking at the contribution that a worker makes *to their own collective's contribution*. And it is not plausible that a worker's labor is a partial *cause* of their own collective's partly causing output—not if we assume, as is standard, that causes need to be distinct from their effects. It thus makes more sense to think of the worker's labor as a partial *ground* of their collective's contribution, where grounding is an asymmetric metaphysical dependence relation, often glossed as the "in virtue of" relation.[55] I do not want to make anything of this difficulty. I am happy to grant for the sake of argument that some partial grounds are more important than others, and that we can measure the importance of partial grounds is the same way that we measure the importance of partial causes. So in what follows I will, where appropriate, translate talk of causation into talk of grounding, without comment. And sometimes I will talk simply of "importance" or "contribution," letting context disambiguate these into causal or ground-theoretic terms.

Kaiserman suggests that, "[c]onsidered apart from their potential applications, none of these measures is any 'better' than the others—they are simply measuring different things." Even when considering the particular application of attributing moral responsibility, it may well be that "there are *two* incommensurable causal dimensions to moral responsibility, the production dimension and the dependence dimension."[56] Though I am not concerned with moral repsonsibility in particular, I will assume a version of Kaiserman's suggestion. That is, I do not argue that one of these measures is uniquely relevant for the determination of the kind of responsibility at play in the case of economic deservingness. I rather want to argue that *none* of the dependence or production measures can vindicate

> UNEQUAL RESPONSIBILITY In some cases where two collectives make the same contribution, some members of those collectives are more important partial grounds of their collective's contribution than others.

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[55]Fine 2012; Rosen 2010.
[56]Kaiserman 2018: 6.

And thus none of the dependence or production measures can vindicate

> UNEQUAL DISTRIBUTION On the basis of being more important partial grounds of their collective's contribution, some workers deserve greater economic reward.

I will look at three kinds of dependence and production measures.

The first and simplest is a dependence measure. It says that the importance of a partial cause is given by the difference that it makes to what it partly causes.[57] Since I have just spent time emphasizing the difference between causation and mere counterfactual dependence—mere difference-making—let me clarify that "the difference that it makes to what it partly causes" here means the difference that it makes when, roughly, *holding preempted backups fixed*. From now on I will mostly leave this italicized phrase unstated.

This first dependence measure looks strikingly like economists' marginal revenue product: the difference between the value of (a firm's) output with a worker and without a worker, where they are not replaced by a new hire—where preempted backups are held fixed.

Some individual workers certainly make a bigger difference—have a bigger marginal revenue product—than others, and in that sense are more important partial causes of it. This is one version of the original reason for assuming that the principle of reward according to contribution would vindicate serious inequality. But, as I noted in the Introduction, I am assuming that we have already taken off the table the idea that workers can claim credit for—deserve reward commensurate with—the size of the differences they *individually* make. This is, to repeat, because its size depends on the collective labor of other workers that the very scheme in question—distribution according to individual contribution—leaves unrewarded.

For this very reason, and this is the second point, UNEQUAL RESPONSIBILITY is not about an individual's importance for total output; it is about their importance for their collective's contribution to total output. These are, to repeat, not the same. For any individual shipping worker, it is plausible enough that they make some difference to total output, even if very small. By contrast, for any one of these workers, their membership in the shipping col-

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[57]This measure has been articulated in a series of papers by Robert Northcott: Northcott 2005a, 2005b, 2006, 2008a, 2008b, 2013.

lective will make no difference to the contribution that the collective makes to total output. To see this, imagine that the shipping collective goes on strike, and is not replaced. The economy will grind to a halt whether or not any given shipping worker joins the strike. It is in that sense that their membership in the shipping collective makes no difference to the difference that the collective makes.[58] This makes the generation of this collective's contribution a case of overdetermination, even when the generation of total output is not.[59] This is why I said, above, that the inefficacy problem is particularly relevant in the present context. Where no worker makes a difference, we cannot use this simplest dependence measure to vindicate Unequal Responsibility.

Does this mean that we can now reject Unequal Responsibility altogether? No. To show that no worker makes a difference is not thereby to show that there is not some other sense in which some workers' labor is more important than others'. In some cases of overdetermination, some overdeterminers *do* seem to be more important than others; and there are both dependence and production measures designed to capture this impression. Since the present case is a case of overdetermination, these are the measures best positioned to vindicate Unequal Responsibility. I now argue that

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[58]Distinguish these two senses in which a member of a collective might make a difference to the collective's contribution. The first is the one that appears in the text: their membership *in the collective* might make a difference. This requires evaluating three possible worlds. First we have the actual world. Next we have a world in which the shipping collective is on strike, and is not replaced. And third we have a world in which the shipping collective is again on strike but this time differently constituted: the single worker in question is not a member of the collective and so does not join the strike. Our question was whether output differs between the second and third worlds. I answered: no. Now for the second sense of making a difference: a worker's membership *in the economy* might make a difference. This requires evaluating four possible worlds—two pairs. In the first pair we have the first and second worlds from above. In the second pair we again compare a no-strike world to a strike world, but this time while imagining the worker in question out of the economy altogether. And now our question: is the difference between the worlds in the first pair bigger? That is, would the abdication of the shipping workers make a smaller difference if the worker in question had never been part of the economy? The answer to *this* question, given what I said in the text, is yes: because the worker makes a difference to total output, they thereby make a difference to the contribution of the shipping collective—that is, by increasing the size of the economy that the collective can bring to a halt. I invoke the first rather than second sense in the text because the first seems to capture a less derivative way of making a difference to the collective's contribution.

[59]I assume that grounding is, like causation, *nonmonotonic*, but also that partial grounds, like partial causes, are not made irrelevant—are not ruled out by nonmonotonicity—merely by their not making a difference.

they, nonetheless, cannot. I will introduce one dependence and one production measure and identify a problem for their application to the economic case. As will become clear, that problem generalizes against any similar measure.

Chockler and Halpern's (2004) dependence measure asks how many other things would have to have gone differently for a given overdeterminer to have made a difference. If a politican wins an election by just a few votes, then only a few things would have to have gone differently for each vote to have been decisive. If the politican instead wins by many votes, then more things would have to have gone differently for each vote to have been decisive. The latter situation is more overdetermined than the former. The voters in the former are, the thought goes, more important partial causes of the outcome.

Braham and van Hees's (2009) production measure is somewhat similar. Here is the rough idea. Take some overdetermined event. Now collect its causes into *minimally sufficient pluralities* of events. A plurality is sufficient if it suffices for the event's obtaining; it is minimally sufficient if none of its sub-pluralities is sufficient. For each cause, count how many such minimally sufficient pluralities it appears in. The greater the number, the more important the cause.

The collective impact literature distinguishes between *threshold* and *non-threshold* cases. As Samuel Lee puts it, "In threshold cases there is some n such that if at least n contribution to a collective action were made then the outcome of that action would be better/worse than if less than n contributions were made."[60] An overdetermined vote is a threshold case: there is a threshold number of votes such that, if a candidate receives that number, each vote (in a two-person race) is decisive. The two measures above both require that we *find a threshold*—that is, that we find a situation in which at the least the cause in question makes a difference.[61] This is straightforwardly true of the first, but it is also true of the second: if a plurality is *minimally* sufficient, then each of its constituents makes a difference.[62]

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[60]Lee 2022: 79.

[61]I intend "situation" to encompass both something like a possible state of affairs, for Chockler and Halpern's measure, and a subplurality of events, for Braham and van Hees's.

[62]I do not claim that to be a constituent in a minimally sufficient plurality *just is* to be a difference-maker; nor do I claim that the former entails the latter on *any* understanding of difference-making. But I do claim that the former entails the latter when we are understanding difference-making in the way that is relevant for causation, i.e., in a way that holds fixed the inactivity of would-be replacements.

Here is what I want to claim: because these measures require that we find a threshold, they cannot be applied to the economic case, and so cannot vindicate UNEQUAL RESPONSIBILITY.

Consider again the dockworker with whom we began. Now search for a threshold—a situation in which their membership in the shipping collective makes a difference to the collective's contribution. How do we search? By subtracting other workers. For Chockler and Halpern this means evaluating counterfactuals in which they are absent; for Braham and van Hees this means kicking them out of our subplurality. Our preliminary assumption is that, just as in the voting case, once we subtract enough of these others a threshold will emerge.

But there is a problem. As we subtract these other workers, before we reach a situation in which the worker in question makes a difference we may reach a situation in which they *cannot do their job at all.* That is because these other workers are among the causal preconditions of the given worker's labor.

Complex economies are doubly interdependent. First, the size of the *contribution* made by a given worker's labor depends on what other workers do. This is what lies behind our assumption that, when we subtract other workers, we will find a point at which the dockworker makes a difference. But, second, that labor *itself* depends on what other workers do. You cannot load containers onto trucks if no one lifts them off the ship in the first place. And so on.

In this respect the economic case is helpfully distinguished from an overdetermined vote. There are some interdependencies in a standard voting case: the votes may not be statistically independent; they may, relatedly, share common causes; and whether or not a vote makes a difference may depend on the other votes. But, for all of that, none of the votes will be a cause of any of the other votes: we vote at the same time, in ignorance of one another. The economic case is not like this. In the economic case, there are causal dependence relations *among* the joint causes of output.

This raises the possibility that there is, for a given worker's labor, *no* situation of the relevant sort in which it makes a difference to their collective's contribution—not because their work is useless but because we cannot reach the situation in which they make a difference without depriving their labor of its causal preconditions. This possibility will be realized whenever the following condition is met: the causal preconditions of a given worker's labor are themselves sufficient for the collective's contribution taking its actual

value.

Here is a procedure for checking whether that condition is met. First, select a given worker's labor, like stacking shipping containers. Second, identify what other bits of shipping-related labor need to be performed for that labor activity to be performed. Third, collect these other bits of labor together—the causal preconditions—and ask: what would happen to total output in their absence? If the answer is that it would fall to zero—that these other shipping workers can themselves bring the economy grinding to a halt—then they are sufficient for their collective making a contribution equal to total output. And so the given worker cannot make a difference to that contribution: any situation in which their labor is performed is also a situation in which the shipping workers could bring the economy grinding to a halt with or without them—that is, it is always already a case of overdetermination.
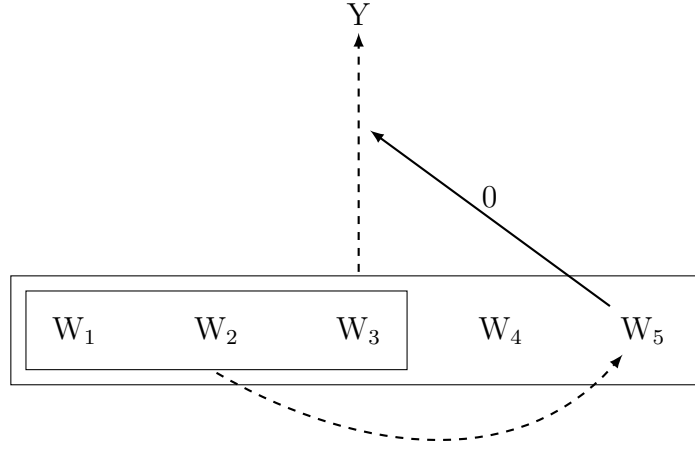
An illustration:

Figure 1: Checking for overdetermination, step 0

The dashed lines represent causal relations. The solid line represents a grounding relation. The dotted lines are drawn from boxes to represent joint causation (by what is inside the box): so for example all five workers—W_1 through W_5—are together a cause of output, Y.

Focus on W_5. This worker's labor partly grounds the fact that their collective is a cause of output—the solid arrow. But they make no difference to the difference that their collective makes to output—the "0" attached to that arrow.

Now we want to look for a threshold, to see if we can get W_5's labor to make a difference, turning the "0" into a positive number. First we subract W_1. Suppose that there is no change:
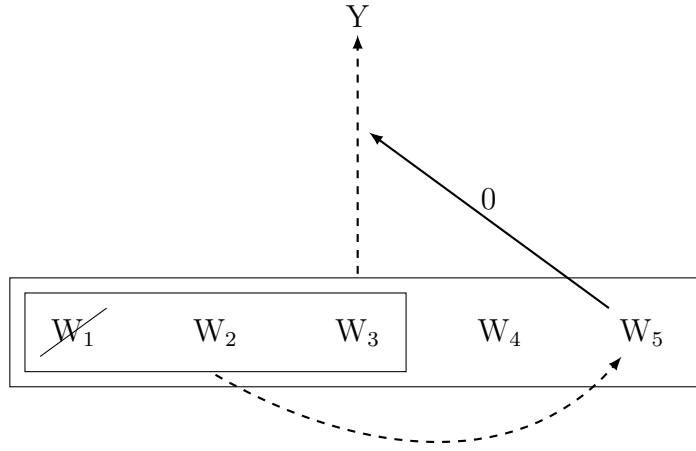
Figure 2: Checking for overdetermination, step 1

Then we additionally subtract W_2. Now suppose that there is a change, but not the one we were looking for. It is not that W_5's labor now makes a difference to their collective's contribution. It is that W_5's labor is no longer performed: W_1, W_2, and W_3 are together a cause of W_5's labor—the curved arrow at the bottom—and without W_1 and W_2, we imagine, W_5 cannot go on:
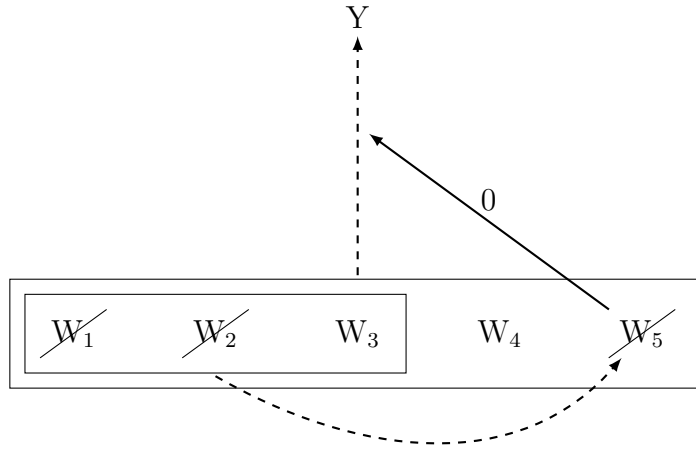

Figure 3: Checking for overdetermination, step 2

Let me re-describe this in less abstract terms. We have a dockworker, and

they make no difference to their collective's contribution—the collective can bring the economy grinding to a halt with or without the one dockworker—so we start subtracting other workers until we find that the one dockworker does make a difference. But before we find that we find something else: the dockworker can no longer perform their job, because we have subtracted other workers whose labor is necessary for it. That is a situation in which the causal preconditions of a given worker's labor are themselves sufficient for the collective's contribution taking its actual value.

The crucial question is this: How often will the causal preconditions of a given worker's labor themselves be sufficient for the collective's contribution taking its actual value? I am not sure, in part because I do not know how fine-grained our individuations of labor activity should be. But it seems that, given almost any plausible principle of individuation, the answer will be: very, very often. Modern economies are astonishingly complex—characterized, as I noted above, by an unusual kind of double interdependence. If one attends to the variety and quantity of goods and services one uses to perform a typical job, and then one imagines out of existence all of the labor (within one's stipulatively defined collective) that supplies those goods and services while holding most everything else fixed, it is difficult to see how one would not thereby imagine an economy brought to a halt. This sort of fragility is what happens when you combine complexity and causality. Real economies may well be *modally* robust, in that their outputs do not counterfactually depend on the system's components being exactly as they actually are. Indeed this is part of what is meant to make markets powerful. But they will still be *causally* fragile: removing a big part of an interconnected system *while holding most everything else fixed* is a recipe for its collapse.

The claim here is not that collective contributions in complex economies are non-threshold cases. Such a claim would face an uphill battle: many philosophers deny that there are any non-threshold cases.[63] My claim is rather that collective contributions in complex economies are a new kind of case—what I will call a *disappearing threshold* case. Here, in looking for a situation in which a given partial cause makes a difference—a threshold—we end up with a situation in which that partial cause does not even occur.

If we cannot find a threshold, we cannot vindicate Unequal Responsibility using anything like the dependence or production measures under

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[63]Beyond Parfit, see Norcross 1997; Regan 2000; Kagan 2011.

consideration.[64]

The foregoing problem is a problem for any dependence or production measure that requires us to find a threshold: we cannot find what disappears in the course of our searching. But there is good reason to think that any such measure will require this. Dependence measures concern difference-making. To find difference-making is to find a threshold. Production measures concern minimal sufficiency. To find minimal sufficiency is in this context to find difference-making, and so to find a threshold.

Let me consider an objection. Even if it is true that the causal preconditions of a given worker's labor are sufficient for the collective's contribution taking its actual value, the objection claims that this problem can be solved using one of several maneuvers from discussions of the semantics of counterfactuals and counterfactual theories of causation. Consider, from the latter, *explicitly nonforetracking* counterfactuals. These are counterfactuals of the form: "If [the cause] had not occurred, but [the effect] had occurred anyway, then..."[65] It might seem that we could use explicitly nonforetracking counterfactuals to push these measures through the barrier raised by the causal interdependence just highlighted. We would do so by evaluating counterfactuals with antecedents like: If the causal preconditions of the dockworker's labor had not occurred, but the dockworker had performed their labor anyway, then... Here is an illustration of this strategy at work:

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[64]I do not mean to imply that, in any disappearing or apparent non-threshold case, we cannot show that some partial causes (grounds) are more important than others. Simply imagine that one of Parfit's torturers presses the button twice: they are still harmless, but now there is pressure to say that they contribute twice as much as the others. (I am taking at face value that this really is a non-threshold case.) The point is rather that, in a case where we cannot find a threshold, we cannot show that some causes (grounds) are more important than others *using an output-based conception of contribution.*
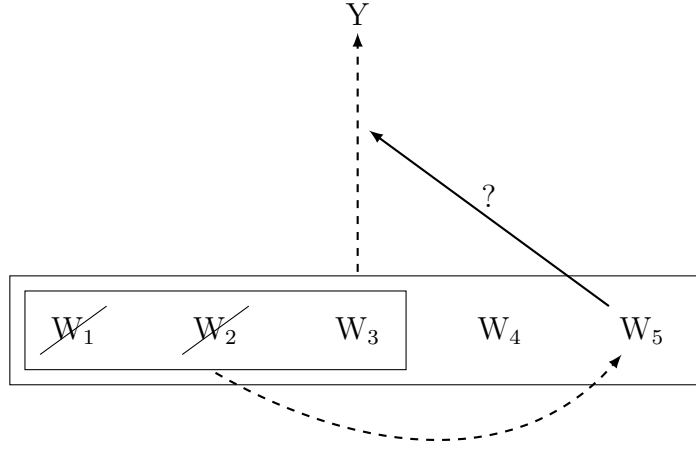
[65]Hitchcock 2001: 275.

Figure 4: Breaking the causal link

The difference between this and the previous illustration is that W_5 is no longer crossed out: we simply stipulate that W_5 carries on, even though the preconditions of their labor, W_1 and W_2, are absent. And now, perhaps, we will find that W_5's labor makes a difference—hence the "?".

The problem is as follows. We are stipulating that other workers—the causal preconditions—have no effect on a given worker's labor *while hunting for one of their effects*, namely the effect of rendering the given worker a difference-maker. Complex economies, I have said, are doubly interdependent. Explicitly nonforetracking counterfactuals would only solve our problem by breaking one kind of economic dependence—the causal dependence of a worker's labor on other workers' labor—while maintaining a second—the dependence of the difference that this labor makes on these other workers' labor. I am not sure if this is coherent; if it is, I cannot see what would justify it. (Similar remarks apply to the use in this context of other maneuvers that likewise cleave effects from their would-be causes, like the invocation of *small miracles* that some philosophers, following Lewis [1973b: 75], think is required to make sense of our ordinary use of counterfactuals.)

4.2 Dividing the Economy into More than Two Collectives

In the previous subsection we divided the economy into the shipping collective and everyone else. Consider now a division of the economy into more than two groups. We might, for example, simply cleave off from the everyone else collective a group of workers who together make a difference much smaller than the value of total output. It is common, in contexts like this, to reference workers who produce things for which there is almost no market demand, like niche artists. But we need not do so. The workers who make wool sweaters and the workers who make Ford Broncos make a difference to output, and indeed a difference that is probably larger than traditional "value-added" calculations would suggest (see note 34), but they could not bring the economy grinding to a halt: they do not make a difference equal to total output. And likewise for any proper subset of these two groups,[66] and for members of any number of other professions. Being useful without being a *sine qua non* is the normal order of things.

But then the normal order of things can also mislead. Any group that falls short of being itself a *sine qua non* will be *part* of a group that is. In the previous paragraph we began by cleaving off a group from the everyone else collective—a collective that makes a contribution equal to total output. And there is, as far as I can see, no objection to the members of the cleaved off group simply ignoring that cleaving: they are unambiguously members of the everyone else collective, and they can legitimately claim a share of economic output on the basis of *that* membership, rather than another.[67] If what I said in the previous subsection is right, then this share will be an equal one, at least insofar as we are guided by reward according to contribution.

To say that these workers have such a claim is not to say that they will make such a claim. This is an important point of connection between the normative claims I am making in this paper and political facts about how workers see themselves. Marxism gives central place to a phenomenon that it helped bring about—the phenomenon of class consciousness. This consciousness is partly consciousness of differences—centrally, in relationships to the means of production. But it is also, the other side of the coin, consciousness of the possibility of seeing themselves as part of one—very important—collective.

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[66]In saying this I am assuming that each member of these groups makes a difference to output—that none of the jobs are "bullshit" in Graeber's (2018) sense.

[67]Thank you to Samuel Scheffler for first pointing this out to me.

The recognition of its importance is recognition of a kind of power, but it is also, on the way of thinking I advance here, recognition of a normative fact. The power is the power to wring out a greater share of output via collective action; the normative fact is that they have a legitimate claim to a greater share, and on the same basis as what grants the power to get it.

4.2.1 The Upshot

Consider a famous claim of Elizabeth Anderson's: "From the point of view of justice, the attempt, independent of moral principles, to credit specific bits of output to specific bits of input by specific individuals represents an arbitrary cut in the causal web that in fact makes everyone's productive contribution dependent on what everyone else is doing."[68]

This claim, while compelling, is not obviously true. Why does crediting each bit of input with the difference that it makes to output represent an arbitrary cut in the causal web? Michael Jordan, to use her example, was helped by the people who keep the court clean, but how many of us really take this to show that there is no important sense in which Jordan contributed more to his team's bottom line (or whatever) than any given ball boy?

Anderson has more recently offered an evocative metaphor for an economy characterized by the kind of interdependence she has in mind: a mechanical clock. She finds the metaphor in a 1627 sermon of Robert Sanderson's:

> God has instituted different callings in society because all are needed to work together in their distinct offices to promote his purposes, like the different parts of a clock. Sanderson preaches that "[T]here is no member in the body so mean or small, but hath its proper faculty, function, and use, whereby it becomes useful to the whole body, and helpful to its fellow-members."[69]

Focus on the claim that each gear in a mechanical clock is essential to its functioning. Now consider two questions. First, is such a clock really analogous to an economy? Second, would this show that each gear "contributed" equally?

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[68] Anderson 1999: 321.
[69] Anderson 2023: 11.

On the first question: I am not a gear. There is almost nothing that I can bring grinding to a halt, let alone the entire economy. The same seems true of every other individual worker. The metaphor is only apt if we consider collectives of workers, e.g., all the occupants of each role in the division of labor.

On the second question: Even if each gear is essential to a clock's functioning, some gears will be harder to replace, and in that sense make a bigger difference. Thus the metaphor only delivers its intended egalitarianism if we understand contribution in causal terms, as opposed to merely counterfactual ones.

Of course these two conditions—that we consider collectives of workers, and that we understand their contribution in causal terms—will look familiar. The first condition is that one I assumed at the outset of this paper, based on my other work. The second condition is the one that I have used the paper to argue for.

If these two conditions obtain, then complex economies really do start to look like mechanical clocks, and the Contribution Principle really does start to look like an egalitarian one.

A Appendix

I offer a structural equations model of slavery's effect on the nineteenth-century American economy that captures the cliometricians' main counterfactual claims. I then show that, on any of the most popular counterfactual theories of causation, this model vindicates the claim that enslaved people were a cause of America's prosperity.

For a comparison of the causal modeling approach used below and the (not too dissimilar) potential outcomes approach that is more common in economics, see Imbens 2020.

The model that I offer is designed to represent three counterfactual dependence claims:

1. American cotton production did not depend on slavery.

2. New England's cotton textile manufacturing did not depend on domestic cotton production.[70]

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[70]We could instead model the claim that the North's industrialization more generally

3. The South's level of investment in physical capital, by contrast, did depend on slavery.[71]

I start with a narrative description of the historical sequence that is here modeled, in which I identify the states of affairs represented by the model's variables, and the model's assignment of values to those variables. As is typical, these values are discrete, and a variable representing a non-occurrence will be assigned a value of 0. Not all of the variables are binary, though. Where a variable can be assigned more than two values, a higher number means more of what the variable represents.

After the Revolutionary War, the United States retains the institution of **chattel slavery** ($CS = 1$). So **enslaved labor** ($SL = 1$), not **free labor** ($FL = 0$), **produces domestic cotton** ($DC = 1$) in the nineteenth century.[72] Cotton is also **produced internationally** ($IC = 1$), but it is not **imported** into New England ($IM = 0$); instead New England uses domestic cotton for the textile production that facilitates **industrialization** ($I = 1$). At the same time, slavery reduces the South's investment in **physical capital** ($PC = 0$). This lowers the country's **growth rate**, even as Northern industrialization and the production of cotton increase it ($G = 3$).

$CS := 1, IC := 1$
$FL := 2 - 2(CS), SL := CS$
$DC := SL + FL, PC := 2 - 2(CS)$
$IM := IC \land (DC = 0)$
$I := (DC + IM) \geq 1$[73]

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did not depend on textile manufacturing; it would not make a difference. Indeed the IM variable below can be given a schematic interpretation as any would-be mechanism for industrializing that was preempted by the actual domestic cotton production and textile production causal chain.

[71] We could instead model one of the other two claims about how slavery dragged the South's economy down; it would not make a difference. Indeed the PC variable can be given a schematic interpretation as any mechanism for slowing growth that is causally independent of the production of cotton and cotton textiles.

[72] Free labor in fact produced around five to ten percent of American cotton even as late as the 1850s (Olmstead and Rhode 2011: 195). I ignore this.

[73] Since this is non-standard, this means: $I = 1$ iff DM and IM sum to one or more; otherwise $I = 0$. One could also use the simpler structural equation $I := DC + IM$, but this simpler equation embeds the assumption that more cotton means more industrialization— and so, given the structural equation for G, faster growth—which is not obviously true.

$$G := DC + I + PC$$
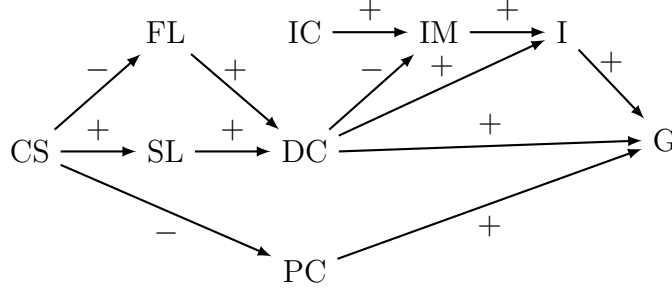
Considered as a representation of an actual sequence of historical events, this model is extremely crude. But, to emphasize, the point is to build a model that represents the three counterfactual dependence claims identified above. Let me first explain why this model does represent those counterfactual dependence claims. I will then explain how it vindicates the claim about enslaved labor and American prosperity.

The first counterfactual dependence claim was that American cotton production did not depend on slavery. The model repesents this via the relationship between CS, FL, and DC. If America had abolished slavery at its founding ($CS = 0$), then free labor would have produced cotton. In particular, there would have been more free laborers producing cotton than there were enslaved laborers: $FL := 2 - 2(CS) = 2 - 2(0) = 2$. And, in the model, domestic cotton production simply requires that there be either free laborers or enslaved people producing cotton. (Its value—which we can think of as the amount of domestic cotton produced—is the sum of the values for the two groups of workers.) Thus the model captures the claim that, without slavery, domestic cotton still would have been produced.

The second counterfactual dependence claim was that New England's textile manufacturing did not depend on domestic cotton production. The model represents this via the relationship between DC, IC, IM, and I. International cotton, the model assumes, is being produced: the value of that exogenous variable is 1. And it would be imported if there were no domestic cotton: $IM := IC \land (DC = 0)$. That would, per the model, be sufficient for cotton textile production, because that production requires only some cotton or other: $I := (DC + IM) \geq 1$. Thus the model captures the claim that, without domestic cotton, New England still would have produced cotton textiles.

The third counterfactual dependence claim was that the South's level of

investment in physical capital depended on slavery. The model represents this straightforwardly: to get the value of the physical capital variable, PC, we subtract twice the value of the slavery variable, CS. If slavery is abolished—if $CS = 0$—the value of the physical capital variable is larger.

These together imply the further cliometric claim that slavery was bad for the American economy. Without slavery, (more) cotton would have been produced ($DC = 2$), and the North would have industrialized anyway ($I = 1$), but the South would have invested more in physical capital. So growth would have been higher ($G = 5$).[74] The basic mechanism here is this: the positive contributions that slavery made to the economy were redundant, while the negative contribution was not.

I now explain why the model vindicates the claim that enslaved people were a cause of America's prosperity. Very roughly, structural equations theories of actual causation say that one thing causes a second thing if and only if the value of the variable representing the second thing depends on the value of the variable representing the first thing while variables that are not on the path from the candidate cause to effect—"off-path variables"—are held fixed at certain values. Which values? Different structural equations theories give different answers to this question.

We begin with the simple theory that Weslake calls (PRE), for "preliminary."[75] According to (PRE)—again speaking roughly—one thing causes a second iff the latter depends on the former holding the off-path variables fixed at their *actual* values. Let us apply (PRE) to the model above. $S = 1$ is our candidate cause; $G = 3$ is our effect. First we hold fixed the off-path variables at their actual values. Then we see whether the value of G depends on the value of S. And indeed it does: if enslaved people did not produce cotton, then, holding the off-path variables fixed, America's growth rate would have been lower. So, per (PRE), $S = 1$ is a cause of $G = 3$.

Now, (PRE) is not a plausible theory of causation: it faces immediate counterexamples. (This is why it is "preliminary.") But its problem is, exclusively, the generation of false negatives. It says that some things which

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[74]I assume that growth is a positive function of cotton production itself, that is, even holding the production of cotton textiles fixed. In other words, I do not assume that cotton production merely increases the permanent level of output without increasing its growth rate. In making this assumption I am relying on the evidence that cotton productivity increased in the nineteenth century (see note 35). None of the present conclusions is affected by this assumption.

[75]Weslake 2015: 7–8.

are clearly causes are not. It does not generate false positives. Thus other, more plausible structural equations theories of causation add but do not subtract: everything that (PRE) deems a cause is also deemed a cause by these other theories. But (PRE), we have just seen, deems the labor of enslaved people a cause of America's prosperity. Thus we can conclude, without any further work, that the other, more plausible structural equations theories do the same.

A final point. If enslaved labor was a cause of American prosperity, what about slavery itself? This question is ambiguous. If "slavery" means the original decision to retain the institution at the country's founding, the answer given by the model is that slavery destroyed more value than it produced: the effect of the reduction in physical capital investment outweighs the effect of the cotton that slavery produced. If "slavery" instead means the subsequent, continued use of enslaved labor, then the answer changes. This is because the reduction in physical capital investment is, per the model, "locked in" by the original decision to retain the institution: PC is a function of CS, not SL. On the one hand this is artificial. Of course the level of investment in physical capital was not a one-time function of the text of the Constitution. But this artificiality captures something plausible: since slavery's effect on physical capital investment had a longer time horizon than its effect on the— after all *annual*—cotton crop, the short-term causal contribution of slavery at any given time should be more positive than its long-term contribution.[76] And, to reiterate, none of this bears on the claim that *enslaved labor* was a cause of American prosperity. That claim, I have argued, cannot be denied.

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[76]Some inside baseball: Is CS, as opposed to SL, even a cause of DC? That is, is this a case of a preemption or a *switch* (Pearl 2000: 324; Weslake 2015: 15–6)? By construction these are *structural isomorphs*, and so the structural equations alone cannot answer the question (Hall 2007: 44ff; Hitchcock 2007; Menzies 2017). Even if we help ourselves to a *default/deviant* distinction (see, e.g., Gallow 2021), it is hard to say. Which state of CS is deviant? It is not clear that the answer matters, though. One cannot deserve economic reward on the basis of forcing other people to do something productive; this is just an extreme instance of wrongfulness undermining economic desert, per 3.2.

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