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The Economic Burden of Incarceration in the United States

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ABSTRACT

This study estimates the annual economic burden of incarceration in the United States. While prior research has estimated the cost of crime, no study has calculated the cost of incarceration. The $80 billion spent annually on corrections is frequently cited as the cost of incarceration, but this figure considerably underestimates the true cost of incarceration by ignoring important social costs. These include costs to incarcerated persons, families, children, and communities. This study draws on a burgeoning area of scholarship to assign monetary values to twenty-three different costs, which yield an aggregate burden of one trillion dollars. This approaches 6% of gross domestic product and dwarfs the amount spent on corrections.

For every dollar in corrections costs, incarceration generates an additional ten dollars in social costs. More than half of the costs are borne by families, children, and community members who have committed no crime. Even if one were to exclude the cost of jail, the aggregate burden of incarceration would still exceed $500 billion annually.

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BACKGROUND

The scale of incarceration over the past forty years in the United States is unprecedented. The prison population grew sevenfold as the U.S. became the world leader in incarceration *(Epperson & Pettus-Davis, 2015; Pew Center on the States, 2008)*. This phenomenon of hyperincarceration has been criticized for being unnecessary, counterproductive, and prohibitively expensive (Alexander, 2010). The 2008 financial crisis underscored these concerns by highlighting the fiscal unsustainability of hyperincarceration *(Henrichson & Delaney, 2012)*. For many state and local governments, corrections spending has become an unaffordable burden.

The $80 billion spent annually on corrections has been cited as the cost of incarceration *(DeVuono-Powell, Schweidler, Walters, & Zohrabi, 2015)*. However, a growing body of research suggests the true cost of incarceration far exceeds the amount spent on corrections *(Pager, 2007; The Pew Charitable Trusts, 2010; Wakefield & Wildeman, 2014; Western, 2006)*. This is because corrections spending ignores costs borne by incarcerated persons, families, children, and communities. Examples of these social costs are the foregone wages of incarcerated persons, increased infant mortality, and increased criminality of children with incarcerated parents. While these costs do not appear on government budgets, they reduce the aggregate welfare of society and should be considered when creating public policy.

The aims of this study are twofold. First, this study draws on prior literature to estimate the annual, aggregate burden of incarceration. This is important because it enables legislators and advocates to understand the scale of hyperincarceration's effects relative to other social problems. This is particularly relevant for incarceration because there is reason to believe the cost of incarceration has been substantially underestimated *(Clear, 2007)*.

Second, this study identifies the specific groups upon whom the costs of incarceration fall. If incarceration solely affected criminal offenders and government budgets, there would be no need for such an analysis. However, it has become clear that the costs of incarceration are also shouldered by families, children, and communities. Incarceration does not take place in a vacuum; incarcerated persons are members of families, organizations, and communities. When a person is removed from these social structures, it comes at a significant cost- not just to the person being removed but to the people and neighborhoods that are left behind. Until now these costs have

not been measured. This a tremendous injustice, for a social policy has been carried out without even identifying who bears the costs or the amount of costs to which they have been subjected. This study addresses this knowledge gap by identifying the extent to which various groups bear the cost of incarceration.

There is a substantial literature measuring the cost of crime *(Anderson, 1999; Cohen, 2005; Ludwig, 2006)*. To date, however, no study has estimated the cost of incarceration. Knowing the cost of incarceration is critical to legislators who weigh the costs and benefits of incarceration in forming criminal justice policy. The $80 billion in corrections spending is misleading because it underestimates the total cost of incarceration, which includes not just corrections spending but all costs that reduce social welfare. This study finds the aggregate burden of incarceration to be one trillion dollars, which approaches 6% of GDP and is eleven times larger than corrections spending.

Each cost estimated in this study represents either the opportunity cost of resources deployed or people's willingness-to-pay to avoid an undesirable outcome, which is consistent with the definition of social costs in the cost-benefit analysis literature *(Boardman, Greenberg, Vining, & Weimer, 2010)*. The willingness-to-pay concept acknowledges that social policies have winners and losers; the amount losers would pay to avoid an undesirable outcome is a social cost (*Stiglitz & Rosengard, 2015)*. Opportunity costs, which refers to the fact that dollars spent on incarceration cannot be spent elsewhere, represent a foregone benefit to society and are thus social costs as well.

This study relies on findings from prior research regarding the value of a person's life and time. These findings are used to calculate opportunity costs and people's willingness-to-pay to avoid incarceration-related harms. Assumptions are explicitly stated when made, and every effort has been taken to use conservative figures. In deriving the cost of incarceration this study relies on an incidence-based approach. This approach identifies the lifetime cost associated with all incidences of incarceration occurring within a single year. When these costs occur in the future (second-generation costs) they are discounted to the present value using a discount rate of 3% *(Fang, Brown, Florence, & Mercy, 2012)*. The Bureau of Labor Statistics inflation calculator was used to adjust figures to 2014 dollars. Consistent with the incidence-based approach, costs

are estimated using the number of new admissions to state and federal prisons in 2014 plus the average jail population for 2014 *(Carson, 2015)*.

Estimating social costs of incarceration is problematic because it is difficult to disentangle the effects of incarceration from the effects of poverty *(Wakefield & Wildeman, 2014; Western, 2006)*. If a formerly incarcerated person earns low wages after being released from prison, this could be due to the stigma of being incarcerated, the erosion of his or her skills during the period of incarceration, or the lack of a social network after having been cut off from the outside world. Alternatively, it could be that the person earns low wages because he or she grew up poor and obtained an inferior education, which led to him or her becoming incarcerated in the first place. To the extent possible this study attempts to identify the unique effect of incarceration, but double-counting of costs is an inevitable drawback to such analyses.

PRIOR LITERATURE

A substantial literature examines the costs of crime *(Anderson, 1999; Cohen, 2005; Ludwig, 2006)*. These costs include crime-induced production, the opportunity cost of people's time, and the value of people's lives. Crime-induced production refers to activities that would not be necessary in the absence of crime *(e.g., paying a police force)*. Time costs assign a value to the minutes people spend locking and unlocking doors or engaging in other aspects of crime prevention. The value of a human life is drawn from the cost-benefit analysis literature, and the value of non-fatal injuries is estimated using jury awards *(Boardman et al., 2010; Cohen, 2005)*.

Crime is by no means the only social problem for which researchers have attempted to measure the cost. Researchers have estimated the cost of childhood poverty, child maltreatment, and disease *(Fang et al., 2012; Holzer, Schanzenbach, Duncan, & Ludwig, 2008)*. While these studies focus on different phenomena, they share a common framework. In each case, the goal is to measure the aggregate reduction in social welfare. This informs policy makers regarding the magnitude of the problem and facilitates comparisons across social issues. While it may seem callous to say that one social issue is more costly than another, governments have finite resources and must make tradeoffs based on relative importance.

Incarceration-related costs have been discussed in a number of studies, but no study has of yet quantified and aggregated the costs *(DeVuono-Powell et al., 2015; Pager, 2007; The Pew Charitable Trusts, 2010; Wakefield & Wildeman, 2014; Western, 2006)*. This study

fills the knowledge gap by estimating the annual burden of incarceration to be one trillion dollars. For ease of exposition, the twenty-three costs estimated in this study are grouped into the following categories: (1) costs of corrections, (2) costs borne by incarcerated persons, and (3) costs borne by families, children, and communities.

COSTS OF CORRECTIONS

Corrections spending ($91.1 billion)

Federal and state governments spend $80 billion annually to operate prisons and jails *(DeVuono-Powell et al., 2015; U.S. Department of Justice, 2013)*. Corrections costs fund the confinement of convicted prisoners and people awaiting trial *(Kearney, Harris, Jácome, & Parker, 2014)*. The ideal way to measure the cost of corrections is to track the costs attributable to all persons incarcerated in a single year throughout their entire spell of incarceration. Unfortunately such data are not available. To approximate the lifetime cost, this study relies on the steady-state methodology used by researchers to estimate the lifetime cost of disease when longitudinal data are not available *(Barnett, Birnbaum, Cremieux, Fendrick, & Slavin, 2000; Birnbaum, Leong, & Kabra, 2003)*. The steady-state methodology allows for the cost of corrections incurred during a single year to serve as a proxy for the lifetime cost for persons who became incarcerated during that year *(Fang et al., 2012)*. An assumption of the steady-state methodology is that the cost of corrections does not fluctuate considerably from one year to the next. The size of the prison population has stabilized over the past few years, so this assumption is likely to hold *(Epperson & Pettus-Davis, 2015).* Using the cost of corrections for a single year thus yields a total corrections cost of $80 billion. However, 13.9% of corrections costs do not appear in government budgets *(Henrichson, Rinaldi, Delaney, 2015)*. These costs include certain pension obligations, health care benefits for correctional staff, and health care provided to inmates. The total cost of corrections is thus $91.1 billion.

Lost wages of incarcerated persons while incarcerated ($70.5 billion)

The wages incarcerated persons could have earned had they been working reduces GDP and constitutes lost productivity. After subtracting the value of prison production (financial savings from work performed by inmates), the average incarcerated person incurs $23,286 ($33,066 in 2014 dollars in lost productivity per year *(Anderson,1999)*. Multiplying this productivity loss by the average jail population (744,600) yields $24.6 billion in lost wages. For prisons, the number of new admissions (626,644)

is multiplied by lost productivity for 2.25 years (the average time served in prison). Using the average prison term accounts for differences in the length of incarceration spells among inmates. The total cost of foregone wages produced by these calculations, discounted to the present value, is $70.5 billion.

TABLE 1 **- COSTS BORNE BY INCARCERATED PERSONS**

COST	$ (BILLIONS)
Reduction in lifetime earnings of incarcerated persons	230.0
Lost wages while incarcerated	70.5
Higher mortality rate of formerly incarcerated persons	62.6
Nonfatal injuries to incarcerated persons	28.0
Fatal injuries to incarcerated persons	1.7
TOTAL	**392.6**

NOTE: The sum of the individual costs does not match the total because of rounding.

Reduced lifetime earnings of formerly incarcerated persons *($230.0 billion)*

Incarceration reduces a person's lifetime earnings between ten and forty percent *(The Pew Charitable Trusts, 2010; Western, 2006)*. Formerly incarcerated persons earn lower wages because they face occupational restrictions, encounter discrimination in the hiring process, and have weaker social networks and less human capital due to their incarceration. The reduced wages of formerly incarcerated persons constitutes lost productivity and is thus a social cost. Incarceration will have no effect on the earnings of the 5% of new admissions who will never be released *(Pager, 2007)*. To estimate the productivity loss for the remaining 95% of new admissions, lifetime earnings (based on full-time work from age 25 to 64) are estimated based on persons' level of education. The educational status of new admissions is as follows: 41.3% of are high school dropouts, 46.0% have a high school diploma/GED, and 12.7% have some form of postsecondary education (Harlow, 2003). The median earnings for high school dropouts, high school graduates, and individuals with an associate's degree are $973,000, $1,304,000, and $1,727,000, respectively *(Carnevale, Rose, & Cheah, 2011)*. Reducing earnings by 25%—the midpoint of the estimates—generates rounded, per-year costs of $3.3 billion, $4.9 billion, and $1.8 billion respectively ([1,302,682* 41.3%* 973,000* 25%] / 40 + [1,302,682* 46.0%* 1,304,000* 25%] / 40 + [1,302,682* 12.7%* 1,727,000* 25%] / 40). Treating each of the per-year costs as a forty-year annuity discounted at 3% produces a total cost of $230.0 billion.

Cost of nonfatal injuries sustained while incarcerated *($28.0 billion)*

The Bureau of Justice Statistics 3rd National

Inmate Survey revealed that 3.2% of jail inmates and 4% of state and federal prison inmates reported being sexually abused during the year *(Kaiser & Stannow, 2013).* This implies that 86,288 rapes and/or sexual assaults occurred in 2014. The cost of a rape has been estimated to be $324,690 in 2014 dollars *(Cohen, 2005)*. Thus, the total cost using the steady-state methodology is $28.0 billion. This is an underestimate because it does not include the cost of physical assaults.

Cost of fatal injuries sustained while incarcerated *($1.7 billion)*

Five hundred and thirty-six people committed suicide in state and local jails in 2013 *(U.S. Department of Justice, 2015)*. The suicide rate for incarcerated persons is 16.5 per 100,000 people, which is 1.587 times greater than the risk for persons not incarcerated *(Cohen, 2005)*. Dividing the number of deaths by the increased risk suggests the incremental number of suicides attributable to the effects of incarceration is 198. Prior research has measured the cost of a person's life to be $8.66 million (in 2014 dollars) so the steady-state methodology generates a total cost of $1.7 billion *(Anderson, 1999*).

Higher mortality rates of formerly incarcerated persons *($62.6 billion)*

The mortality rate of formerly incarcerated persons is 3.5 times higher than that of people who have not been incarcerated *(Binswanger, Stern, Deyo, Heagerty, Cheadle, Elmore, & Koepsell, 2007)*. For every 100,000 person-years there are 777 deaths among formerly incarcerated persons compared to 222 for the rest of the population *(Binswanger et al., 2007)*. Multiplying the incremental mortality by the number of new admissions (only the 95% of whom will be released at some point) yields a figure of 7,230 premature deaths *(Binswanger et al., 2007; Kaeble, Glaze, Tsoutis, & Minton, 2015; National Resource Council, 2014).* Multiplying this by the value of a person's life produces a total cost of $62.6 billion (7,230* 8,662,000).

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TABLE 2 **- Costs Borne by Families, Children, and Communities**

COST	$ (BILLIONS)
Criminogenic nature of prison	285.8
Increased criminality of children of incarcerated parents	130.6
Children's education level and subsequent wages as an adult	30.0
Marginal excess burden	17.8
Divorce	17.7
Decreased property values	11.0
Adverse health effects	10.2
Reduced marriage	9.0
Child welfare	5.3
Interest on criminal justice debt	5.0
Reentry programs, nonprofits, movement to end mass incarceration	2.9
Homelessness of formerly incarcerated persons	2.2
Infant mortality	1.2
Children rendered homeless by parental incarceration	0.9
Visitation costs	0.8
Moving costs	0.5
Eviction costs	0.2
TOTAL	**531.0**

NOTE: The sum of the individual costs does not match the total because of rounding.

Visitation costs ($0.8 billion)

To visit incarcerated persons, family members must spend time traveling, incur transportation costs, and suffer emotional harm from being strip-searched *(DeVuono-Powell et al., 2015)*. There are 700,000 families with an incarcerated family member and the opportunity cost of a person's time is $18.66 in 2014 dollars *(Anderson, 1999; Clear, 2007)*. Assuming one person from each family spends five hours traveling to and from visits each month, the cost of this wasted time is $0.8 billion (700,000* 5* 12* 18.66) using the steady-state methodology.

Moving costs *($0.5 billion)*

The incarceration of a family member increases the likelihood that other family members will change their residence *(Clear 2007)*. A family might move closer to the prison or jail, or a significant other might move to begin cohabiting with a new

person. The release of the incarcerated person from prison or jail could trigger yet another move. According to the American Moving & Storage Association, the average cost of an intrastate move is $1,170 and the average cost of an interstate move is $5,630 *(Williams, 2014)*. One out of nine families changed residences between 2013 and 2014 *(U.S. Census Bureau, 2015)*. If one out of nine new admissions to prison or jail have a family member who moves because of incarceration, the number of incarceration-related moves is 152,867 and the total cost (based on the weighted-average cost of a move) is $0.5 billion (152,867* (1,170+5,630) / 2).

Eviction costs *($0.2 billion)*

Incarceration eliminates an incarcerated individual as a source of income for his or her family, thereby increasing the chance of eviction. Release from incarceration also increases the chance of eviction because people with felony convictions face barriers with private landlords and in some cases are banned from public housing *(DeVuono-Powell et al., 2015)* Ten percent of formerly incarcerated persons report family members being evicted from their home post-incarceration *(DeVuono-Powell et al., 2015)*. The average cost of an eviction is $1,635 *(TransUnion, 2014)*. Thus, the total incarceration-related cost is $0.2 billion (1,371,244* 0.10* 1,635). This underestimates the true cost because it only includes costs to landlords and ignores the emotional harm suffered by families.

Interest on criminal justice debt *($5.0 billion)*

Incarceration may cause the family of an incarcerated person to go into debt. Transportation and telephone costs alone put 34% of families in debt *(DeVuono-Powell et al., 2015)*. The total amount of criminal justice debt owed is $50 billion; at an interest rate of 10% this yields an annual cost of $5 billion based on the steady-state methodology *(DeVuono-Powell et al., 2015)*.

Adverse health effects *($10.2 billion)*

Sixty-six percent of incarcerated persons and family members report experiencing detrimental mental health effects such as depression, anxiety, and post-traumatic stress disorder *(DeVuono-Powell et al., 2015)*. The cost of PTSD, major depression, and PTSD with major depression are $5,900 to $10,300, $15,460 to $25,760, and $12,430 to $16,890, respectively *(Tanelian, Jaycox, & Invisible Wounds Study Team, 2008)*. The high estimates include the loss of life due to suicide *(Tanelian et al., 2008)*. This study uses the low estimates to avoid double-counting suicides that were accounted for by nonfatal injuries to

incarcerated persons. The average of the low estimates is multiplied by the incidence rate and the number of new admissions annually yields a total cost of $10.2 billion (1,263* 0.66* 1,371,244).

Infant mortality *($1.2 billion)*

After controlling for other risk factors parental incarceration increases infant mortality by 40% *(Wakefield & Wildeman, 2014)*. The infant mortality rate in the U.S. is 5.96 deaths per 1,000 live births, so incarceration results in an additional 2.384 deaths per 1,000 live births for infants with an incarcerated parent *(Center for Disease Control and Prevention, 2015)*. The number of live births for incarcerated parents was 56,119 in 2014 ([210,567/(210,567 +1,350,958 +744,600)* 0.7% + (1,350,958 +744,600) / (210,567 +1,350,958 +744,600) * 2.4%)]* 2,500,000). This was calculated using a weighted average for federal and state prison populations, with the percentage of jail inmates with infant children assumed to be the same as that of the state *(Glaze & Maruschak, 2010)*. The incremental mortality implies an additional 134 children die (56,119* 2.384/1,000). Based on the value of a human life the total cost is $1.2 billion, using the steady-state methodology.

Children's education level and subsequent wages as an adult ($30.0 billion)

Ten percent of incarcerated persons' children are unable to finish high school or attend college because of their parents' incarceration *(DeVuono-Powell et al., 2015)*. Since half of incarcerated individuals contributed at least 50% of their families' income, their teenage children may forego education and prematurely enter the labor force to compensate for the lost family income *(DeVuono-Powell et al., 2015)* This is a social cost because it leads to underinvestment in the human capital and productivity of young people.

Assuming that new admissions (only the 42.2% of whom have zero criminal history, to avoid double-counting) are responsible for a proportionate share of the 2.5 million children with an incarcerated parent, there were 627,313 children ((1,371,244* 0.422) / 2,306,125* 2,500,000) affected by parental incarceration for the first time in 2014 *(U.S. Sentencing Commission, 2004)*. If 10% of these children did not complete their education due to parental incarceration, then 62,731 children did not complete their educational goals. The difference in lifetime earnings for a high school dropout versus a high school graduate is $331,000 and the difference for a high school dropout versus a college graduate is $1,295,000 *(Carnevale*

et al., 2011). The weighted-average of these reductions in lifetime earnings is $813,000. Multiplying the weighted-average reduction by the number of children who do not complete their education goals produces a discounted cost of $30.0 billion ((62,731*813,000) / 1.03[18]).

Increased criminality of the children of incarcerated parents *($130.6 billion)*

Children of incarcerated parents are five times more likely to go to prison *(Simmons, 2000).* If parental incarceration increases the criminality of children, then it creates second generation costs that are manifested in a higher rate of future crime *(Cohen, 2005; Glueck & Glueck, 1950; Hagan & Palloni, 1990; Murray & Farrington, 2005; Sampson & Laub, 1993; West & Farrington, 1977; Wildeman, 2009)*. Assuming that new admissions (only the 42.2% who have zero criminal history, to avoid double-counting) are responsible for a proportionate share of the 2.5 million children with an incarcerated parent, there were 627,313 children (1,371,244*0.422) / 2,306,125* 2,500,000) affected by parental incarceration for the first time in 2014. The likelihood that the average person will commit a crime is 5.1% so the incremental likelihood that children with incarcerated parents will commit a crime is 20.4% (25.5% – 5.1%). Parental incarceration thus creates 127,972 future offenders annually (627,313 * 0.204). The number of offenders created is 9.33% of new admissions (127,972 / 1,371,244). Assuming the amount of crime increases proportionate to the increase in new admissions, the 9.33% increase in crime generates discounted costs of $130.6 billion in 2014 dollars (9.33% * 2,382,120,000,000) / 1.03[18]).

Child welfare costs *($5.3 billion)*

Changes in the incarceration rate of females alone accounted for 30% of the increase in foster care caseloads between 1985 and 2000 *(Swann and Sylvester, 2006)*. The cost to the child welfare system per victim is $7,728 *(Fang et al., 2012)*. Assuming 30% of the 2.1 million screened-in referrals (those resulting in an investigation by Child Protective Services) were related to parental incarceration, the total cost is $5.3 billion in 2014 dollars (2,100,000* 7,728* 0.30* 1.09) using the steady-state methodology *(U.S. Department of Health and Human Services, 2015)*.

Children rendered homeless by parental incarceration *($0.9 billion)*

At least 60,000 children (between 2.4% and 2.7% of the 2.5 million children with an incarcerated parent) become homeless as a result of parental incarceration *(Wakefield & Wildeman, 2014)*.

The average cost of homelessness is $14,480 per homeless person, so the total cost of child homelessness is $0.9 billion (60,000* 14,480) using the steady-state methodology *(National Alliance to End Homelessness, 2015).* This figure is an underestimate because it does not include the psychological harm becoming homeless does to children.

Homelessness of formerly incarcerated persons *($2.2 billion)*

Between 25% and 50% of the homeless population is formerly incarcerated *(Knopf-Amelung, 2013)*. The most recent estimate of the homeless population is 610,042. Using the lower of the two estimates listed above produces an estimated total of 152,511 formerly incarcerated persons among the homeless *(Henry, Cortes, & Morris, 2013)*. The average cost of homelessness to taxpayers is $14,480 annually per homeless person, so incarceration leads to $2.2 billion in homelessness costs using the steady-state methodology *(National Alliance to End Homelessness, 2015)*. This underestimates the true cost because it does not include the emotional harm to the people who are homeless.

Reentry programs *($2.9 billion)*

The 2015 Second Chance Act (SCA) and Justice and Mental Health Collaboration Program (JMHCP) conference was attended by 1,400 federally-funded reentry programs *(National Reentry Resource Center, 2015*). The average budget for a public charity is $2,093,772 so the steady-state methodology places the cost of these reentry programs at $2.9 billion *(National Center for Charitable Statistics, 2015)*. This is an underestimate because it does not account for the time spent by volunteers, academics, and government officials on the movement to end mass incarceration.

Decreased property values *($11.0 billion)*

Incarcerated persons are released into concentrated areas after completing their sentences, which could reduce property values in those neighborhoods *(Clear, 2007)*. If people prefer not to live near formerly incarcerated persons, this could increase the number of homes for sale in a neighborhood and decrease housing prices. Incarceration might also reduce property values because it removes individuals from the community and thus makes it difficult for their families to maintain their lawn, contribute to community efforts, and avoid eviction.

Research suggests people willingly incur costs to avoid living near a formerly incarcerated person. Housing values decline between 2.3% and 4% when a sex offender

moves into an area, with actual declines of $5,500 and $3,500, respectively *(Linden & Rockoff, 2008; Pope, 2008)*. While the authors of these studies argued the property value decreases were a cost of crime, this study assumes the stigma of incarceration is responsible for the property value decline. Applying the weighted average of these price declines to the 95% of new admissions who will one day be released, and assuming that the arrival of each formerly incarcerated person affects the value of two homes *(Pope, 2008 suggests homes within a 0.1-mile radius are affected)*. Thus, the discounted cost is 11.0 billion ((1,371,244* 0.95* 4,500*2) / $1.03^{2.25}$).

Criminogenic nature of prison *($285.8 billion)*

High levels of incarceration may actually increase crime by reinforcing behavior and survival strategies that are maladaptive outside the prison environment *(Aizer & Doyle, 2015; Kellogg, 2015; Hoge, Buchanan, Kovasznay, & Roskes, 2009; Reiman & Leighton, 2013)*. Removing large numbers of people from communities may also weaken the social controls that bind neighborhoods together *(Reiman & Leighton, 2013)*. Estimates of the criminogenic effect of prison range from 4% to 23% *(Aizer & Doyle, 2015; Bhati & Piquero, 2008; Smith, Goggin, & Gendreau, 2002)*. Applying the midpoint of this range (13.5%) to the annual cost of crime and adjusting for the fact that 5% of incarcerated persons will never be released generates a discounted cost of $285.8 billion ((0.95* 0.135* 2,382,100,000,000) / $1.03^{2.25}$).

Divorce *($17.7 billion)*

Incarcerated persons have triple the divorce rate of people who are convicted but not incarcerated *(DeVuono-Powell et al., 2015)*. Divorce retards economic growth by eliminating economies of scale and eroding human capital *(Potrykus & Fagan, 2012)*. The ramifications are substantial; Nobel Prize-winning economist Robert Lucas described human capital as the primary driver of economic growth *(Lucas, 1993)*. The amount of growth attributable to human capital has been variously estimated to be 61%, 49%, and 22% *(Hall & Jones, 1999; Jorgenson & Fraumeni, 1992; Mankiw, Romer, & Weil, 1992; Umut, 2015)*. Divorce reduces human capital by one-fourth *(Potrykus & Fagan, 2012)*. Because real GDP has grown 3.22% annually since 1948, divorce has reduced economic growth by at least 0.1771% (0.22* 0.25* 0.0322). Thus, the 2014 GDP figure of $17.42 trillion would be $30,850,820,000 higher if not for divorce *(The World Bank, 2015)*. The amount attributable to incarceration can be ascertained by noting that 47%

of incarcerated persons' family members obtained a divorce or separated from a partner as a result of incarceration *(DeVuono-Powell et al., 2015)*. This study assumes a separation has the same economic effect as a divorce. Multiplying this proportion by the number of new admissions generates an estimate of 644,485 incarceration-related divorces and separations. The total number of divorces in the U.S. in 2013 was 1,121,294 *(Center for Disease Control and Prevention, 2015)*. Thus, the incarceration-related component of the cost of divorce is $17.7 billion (644,485 / 1,121,294* 30,850,000).

Cost of reduced marriage *($9.0 billion)*
Incarceration also reduces the likelihood of marriage for formerly incarcerated persons *(Clear, 2007)*. Foregone marriage generates costs for the same reasons as divorce *(Potrykus & Fagan, 2012)*. The reduced likelihood of marriage is highest for black males, who are 50% less likely to become married following a period of incarceration *(Clear, 2007)*. This study conservatively assumes formerly incarcerated persons are 25% less likely to become married. Applying this percentage to new admissions who will be released at some point yields an estimate of 325,670 for the number of people who will forego a marriage opportunity. Assuming the cost of a foregone marriage is equivalent to the average cost of a divorce (30,850,820,000 / 1,121,294), the total cost of foregone marriage opportunities is $9.0 billion.

Marginal excess burden *($17.8 billion)*
Corrections costs are funded by government taxes. Taxes are distortionary (other than a head tax, which is not used to fund corrections) in that taxpayers change their behavior in response to the tax. Taxpayers may choose to work less, for example, because the price of leisure has been lowered by the presence of a tax.

The deadweight loss that occurs due to this distortionary effect on behavior is referred to as marginal excess burden *(Feldstein, 1999)*. Saez, Slemrod, and Giertz measure the marginal excess burden to be $0.195 per dollar of taxes (2012). Multiplying this amount by the cost of corrections ($91,120,000,000) generates a total excess burden of $17.8 billion.

Discussion

The aggregate burden of incarceration in the U.S. for a single year is $1.014 trillion which is nearly 6% of GDP and eleven times the size of corrections spending *(DeVuono-Powell et al., 2015; Pager, 2007; Western, 2006)*. There are $923 billion in costs that do not appear on state or federal budgets. The failure to take these costs into consideration could cause legislators to overestimate the net benefit of incarceration when they are determining criminal justice policy. This is because social welfare is maximized when incarceration is supplied at the level where the marginal social benefit equals the marginal social cost. Underestimating the cost of incarceration by ignoring hundreds of billions of dollars in costs could cause incarceration to be oversupplied, resulting in a level of incarceration beyond that which is socially optimal.

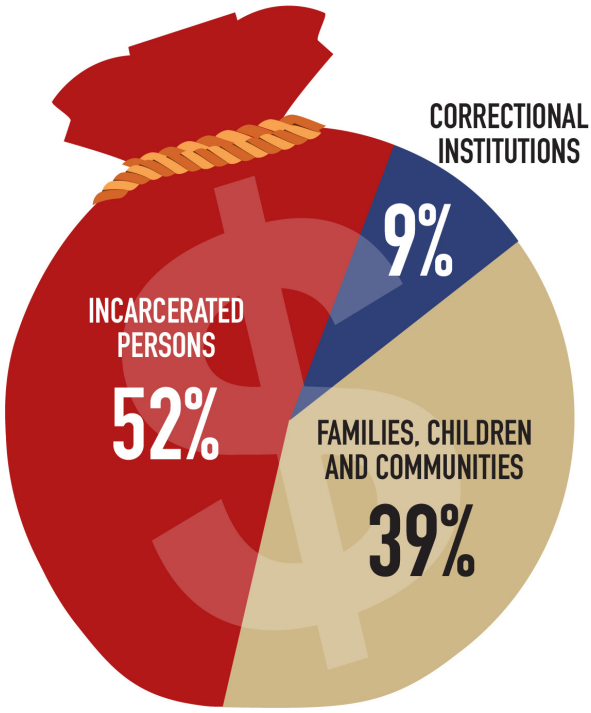
TABLE 3 **- AGGREGATE BURDEN OF INCARCERATION**

	(BILLIONS)	
COST	**$**	**EXCLUDING JAIL**
To correctional institutions	91.1	65.9
To incarcerated persons	392.6	200.4
To families, children, and communities	531.0	247.7
TOTAL	**1,014.7**	**514.0**

NOTE: The sum of the individual costs does not match the total because of rounding.

As a sensitivity check, the cost with jails excluded is presented alongside the cost of incarceration inclusive of jails *(See Table 3).* This is done to address the potential objection that being sent to jail doesn't have the same negative effects as being sent to prison (e.g., reduced lifetime earnings). Even after excluding the costs attributable to the jail population, the aggregate burden still exceeds $500 billion, nearly half of which is borne by families, children, and communities. The costs of jail are important, however, and should not be neglected. More than eleven million people cycle in and out of jails each year, and a case could be made that conditions in jails are worse than conditions in prison *(Clear, Reisig, & Cole, 2016).* Ignoring the costs of jail would lead to the cost of incarceration being significantly underestimated.

FIGURE 1
INCARCERATION COST BY GROUP



Even if it could be argued that society is currently producing an efficient level of incarceration, there are substantial equity considerations raised by this study's findings. *Figure 1* shows that the majority of costs are borne not by government agencies or the persons being incarcerated but by families, children, and communities. These individuals and groups have committed no crime, yet they incur the majority of the costs. These are real economic costs that should be considered when weighing the costs and benefits of whether to incarcerate an individual. Yet, until now these costs have not even been measured. Legislators, advocates, and members of the criminal justice community must ask whether the current system is equitable if children, families, and neighborhoods bear most of the costs. If the goals of incarceration are deterrence and incapacitation, why do so many innocents bear the brunt of the cost? Whatever marginal benefit is obtained by incarcerating a nonviolent drug offender, it seems unlikely that this benefit would outweigh the costs generated if his or her family becomes evicted, goes into debt, and has a child drop out of high school as a result. Such tradeoffs have not been discussed because more than 90% of the costs of incarceration do not appear on government budgets and are absent from policy discussions.

Worse yet, the aggregate burden of incarceration estimated in this study may actually be an underestimate. First, it does not account for the damage incarceration causes to social networks or the emotional harm inflicted on children and families *(National Resource Council, 2014)*. Second, it does not include the cost of juvenile incarceration, which may be substantial *(Aizer & Doyle, 2015)*. Third, it does not account for a number of costs that are difficult to measure, such as the psychological pain children suffer when they become homeless or the deterioration in

physical health experienced by incarcerated persons and their families. Finally, it does not account for the human potential and innovation lost by incarcerating millions of people. In the long run, this could jeopardize the United States' status as the world's economic leader. Future research could estimate the cost of incarceration more accurately by incorporating these additional costs.

Another limitation is that this study does not consider the benefits of incarceration. To set the optimal rate of incarceration, a policy maker would need to know not only the costs of incarceration but also the benefits. Prisons serve a valuable purpose by providing deterrence and incapacitation effects *(Levitt, 2004; Yezer, 2014)*. Yet, there is a point where the marginal cost of incarcerating an additional individual exceeds the marginal benefit. Cost-benefit analysis is the standard framework for evaluating policy in this manner *(Boardman et al., 2010)*. The first step is understanding the cost of incarceration, which this study aims to establish. Future research could provide a richer understanding by identifying the benefits of incarceration and weighing them against the costs at the margin.

Like all studies that estimate the economic burden of a social problem, this study is grounded on the research, techniques, and estimates derived by other researchers. To the extent that previous estimates (e.g., the value of a human life) were measured with error, the costs computed in this study will be less precise. Future researchers can improve upon these methods so that more precise calculations can be made. But even having done so, there is the omnipresent danger of double-counting. Many of the costs of incarceration may actually be costs of poverty or other social problems. To the extent that double-counting occurs, the cost of incarceration will be imprecisely estimated. Future researchers can provide a more accurate measure of the cost by identifying better counterfactuals and isolating the costs specifically traceable to the effects of incarceration.

Conclusion

Researchers have devoted considerable effort to estimating the cost of crime, but no study has yet estimated the aggregate burden of incarceration. Recent reports highlighting the costs to incarcerated persons, families, and communities have made it possible to estimate the true cost of incarceration, which is found to be one trillion dollars. This approaches 6% of GDP and is eleven times larger than corrections spending. This is important because it suggests that the true cost of incarceration has been grossly underestimated, perhaps resulting in a level of incarceration beyond that which is socially optimal.

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