

**INSTITUTE FOR PUBLIC POLICY
AND ECONOMIC ANALYSIS**

**Washington State Childcare
Study: Analyzing the Costs
Facing Businesses Due to
Workforce Turnover and
Missed Time Associated
with Inadequate Childcare
Options**

By:

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August, 2019



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Workforce Turnover and Missed Time Associated with Inadequate
Childcare Options**

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Table of Contents

Executive Summary	1
Section 1: Data	
1.1 American Community Survey	3
1.2 IMPLAN	3
1.3 Childcare Survey – Washington State Parents	4
Section 2: Turnover Costs Associated with Childcare Issues	
2.1 Methodology	4
2.2 Turnover Cost: Direct Effects	5
2.3 Turnover Cost: Assumptions	6
Section 3: Late for Work/Early Departures Costs Associated with Childcare Issues	
3.1 Methodology	6
3.2 Late for Work/Early Departure Cost: Direct Effects	7
3.3 Late for Work/Early Departure Cost: Assumptions	8
Section 4: Top 15 Industries Effectuated	8
Section 5: Comparisons to Other Studies	9
Section 6: Total Effect, “Opportunity Costs” Facing Businesses	
6.1 Opportunity Cost: Turnover	11
6.2 Opportunity Cost: Late to Work/Early Departure	12
6.3 Opportunity Cost: Combined Effects	13
6.4 Opportunity Cost: Top 15 Industries Effectuated	13
6.5 Opportunity Cost: Assumptions	14
Section 7: Additional Points of Study	15
Section 8: Bibliography	16

Executive Summary

The Washington Association for Businesses (AWB), along with the Washington State Department of Commerce, commissioned the EWU Institute for Public Policy and Economic Analysis (the Institute) to estimate the cost to businesses in Washington State from employees facing childcare issues. These issues could stem from a variety of causes, such as childcare being too expensive to justify a second parent working, insufficient supply of available caregivers, or lack of flexibility in employees' schedules to accommodate childcare arrangements. Similar studies have been conducted in the states of Louisiana and Georgia; these served as a theoretical framework for this analysis focusing on Washington State.

The first question AWB asked the Institute to determine consisted of the total costs facing businesses when an individual is either let go or voluntarily leaves due to childcare issues. Similar to the first, the second question looked at costs facing businesses from missed time from work by employees. This is made up of events where parents need to leave work early or arrive late as a result of inadequate childcare options.

This analysis relied heavily on three sources of data. First was the Washington Childcare Survey conducted by Elway Research, Inc. This provided the Institute with estimates of how many parents quit or were terminated, as well as the estimated share of workers missing time from work to due to childcare issues. This was a primarily online survey of 400 parents of children age five and under. Second was the American Community Survey (ACS) produced by the U.S. Census Bureau. This is an annual survey of roughly 3,500,000 households across the United States and provided the Institute with an accurate estimate of the total number of

workers with children age 5 and under in Washington State. The third source was the employment database found in the input-output modeling software program, IMPLAN. This source allowed our team to estimate the average annual employee compensation and employment shares across over 500 sectors in Washington. Using IMPLAN in conjunction with the ACS and Childcare Survey, the Institute was able to calculate average annual employee compensation by sector in Washington for only those workers with children age five or younger living in the household.

Following the framework laid out in the Louisiana and Georgia childcare studies, our team set employee compensation outlays to 20.7% of the annual total, as the direct costs to businesses experiencing worker turnover. Given this assumption, the Institute estimates that Washington businesses expended \$2.03 billion in employee compensation in direct turnover costs associated with childcare issues in 2017. Using Bureau of Labor Statistics estimates on hours of time missed (0.25%) annually due to family issues, the research team estimated that workers arriving late or leaving early due to childcare issues posed a direct cost to businesses across the state of \$53.4 million in 2017.

These direct costs were then used as inputs to estimate the total effects, or *opportunity costs* to the State economy due to a workforce facing issues stemming from childcare. The opportunity costs represent the value to the economy if the costs that firms incur from lost productivity due to childcare constraints were reinvested into their businesses rather than paid to rehire, retrain, or cover missed hours of work. If entirely reinvested, the labor market could support an additional 61,158 FTE positions and distribute an additional \$3.7 billion in labor income to Washington workers.

The basis of these estimates come with a set of assumptions. First, our team assumes that the parental labor force is representative of the entire state labor force. Second, workers with young children are paid at the industry averages. Third, missed hours of work aren't

covered using vacation or sick leave. Since these are rather strong assumptions, the results should be taken as estimates that represent an upper bound of values.

1.0 Data

This report addresses two scenarios facing businesses across Washington. The first consists of the turnover costs incurred by firms, within a given sector, due to exits in the workforce associated with childcare issues. This could come as a result of an individual leaving on his or her own accord or a firm deciding to lay off the individual for consistently missed work. The second scenario looks at lost wages due to workers missing partial days of work due to childcare issues. This could be from an individual arriving early or late due to issues surrounding lack of childcare.

In both cases this study relies heavily on the American Community Survey (ACS) produced by the U.S. Census Bureau, on IMPLAN, an input-output program used to run economic analyses, and on a Childcare Survey recently conducted by Elway Research Inc. contracted by Washington Association of Businesses.

1.1 American Community Survey (ACS)

The data compiled in the ACS are similar to that of the census formerly taken every ten years to provide a count of the population as well as basic demographic information. However, the ACS is different from the decennial census in that it's a survey taken on a continual basis throughout each year. It provides up to date estimates that can be used to track changes in demographic, social, and economic characteristics on the U.S. population. The ACS estimates are produced from an annual survey of roughly 3.5 million households across the United States.

Here we made use of the most current data available, the 2017 estimates, in order to obtain the total number of workers with children under the age of six in the state.

1.2 IMPLAN

In conjunction with the ACS data, the Institute utilized the IMPLAN program software and data set. The IMPLAN program is an input-output (IO) modeling program used to study interactions between producers and final users in the economy. The program is widely employed to analyze impacts related to industry development, professional sports, tourism, educational institutions and construction, among others. To develop models to study local economies, IMPLAN reconfigures relationships among industries, between industries and "final demand" components (consumption, net exports, and governments) from the U.S. Bureau of Economic Analysis (BEA) national input-output model for local application. Data for this analysis are taken from state and federal sources compiled by the BEA, Bureau of Labor Statistics (BLS), U.S. Department of Commerce, U.S Department of Agriculture and related state agencies.

It is through the use of detailed IMPLAN data that this study was able to address the average annual compensation and employment shares of Washington firms for each of the model's 536 unique sectors, ranging from data processing to support activities for agriculture. Here the employee compensation is comprised of benefits in addition to wages/salaries. By considering the effects of exits and lost compensation for each of the 536 sectors, one should arrive at a more accurate calculation than simply using a state-wide average.

1.3 Childcare Survey – Washington State Parents

The final portion of data comes from Elway Research Inc.’s recent Childcare Survey contracted by the Washington Association of Businesses (AWB). This was a survey of 400 parents in Washington with children age five and under. From the survey, the Institute utilized estimates associated with the share of parents being fired or quitting work and those arriving late or early due to issues surrounding childcare. These results, assumed to be broadly representative, were applied to ACS population estimates of the relevant parent categories.

2.0 Turnover Costs Associated with Childcare Issues

2.1 Methodology

In order to address the turnover costs related to childcare issues, the study first required an accurate estimate of the total number of workers with children under the age of six. For this, the Institute turned to ACS data. According to the 2017 ACS, there are an estimated 3,599,753 individuals working in Washington (data found in table 2.1a). Of that total, 527,825, or roughly 15%, of those individual have children under the age of six living in their household. Using

Table 2.1a. Family Composition of Workers

Worker Characteristics	Total Individuals	Share of Workforce
All Employed	3,599,753	100%
Workers with Children Under 17 Years	1,576,122	44%
<i>Workers with Children Under 6 Years</i>	<i>527,825</i>	<i>15%</i>

Source: American Community Survey

this data as a base for all workers in Washington with children under the age of six, we then applied survey results from Elway Research, looking at those parents who quit or were fired due to childcare issues. According to the survey, 18% of workers with children under the age of six quit and 9% reported being fired due to childcare issues. The calculations are presented in Table 2.1b depicts the application of these shares. There were an estimated 142,513 workers in Washington State in 2017 that left

the workforce, at least temporarily, due to childcare issues: 95,009 coming from those that quit and 47,504 coming as terminated employees. Using this number as the baseline employment of workers who experienced turnover, we then turned to IMPLAN to assign these workers to various sectors throughout the Washington economy. This step, while time-consuming, is important due to the large variation in compensation between the various sectors.

Table 2.1b. Workers Leaving the Workforce due to Childcare Issues

Worker Characteristics	Total Individuals	Share of Workforce
Workers with Children Under 6 Years	527,825	15%
Workers Quitting	95,009	18%
Workers Fired	47,504	9%
<i>Total Turnovers due to Childcare Issues</i>	<i>142,513</i>	<i>27%</i>

For each sector, we created an annual average compensation amount by dividing total compensation by employment across the 536 IMPLAN sectors. Then we reduced the annual average compensation by 20.7%, following the methodology used in both the Louisiana and Georgia childcare reports. This portion of the average annual compensation is the estimated cost to businesses associated with employee turnover taken from a meta-analysis conducted by Boushey & Glenn (2012). This study found that, on average, each turnover a business faces costs them on average 20.7% of the employee salary and indirectly due to lost productivity, training expenses, and costs associated with finding a new employee. The Institute believes this is a reliable estimate and possibly even a conservative one, as this would represent a firm taking about 2.5 months to get a new employee hired and up to productivity levels matching that of the prior worker. Applying this method, we were able to obtain the average annual wage associated with turnover, this is roughly \$14,000 for the average worker in Washington.

With further use of the IMPLAN data set, our team created a share of total employment for each of the IMPLAN sectors. We then applied, for each sector, that share to the total number

of workers with children under the age of six who experience employment turnover due to childcare calculated in the prior steps using the ACS and Washington childcare survey. This created a sector breakdown of those who lost their job, which we could then multiply by the sector specific average compensation associated with turnover costs.

2.2 Turnover Cost: Direct Effects

Across all sectors within the state’s labor market businesses paid out a nearly \$300 billion in employee compensation in 2017, data found in table 2.2. This equated to an average annual wage of \$68,646, remembering that employee compensation includes both wages/salaries along with benefits. Adjusting the average annual wage by 20.7%, representing the cost to businesses in terms of average turnover cost, or \$14,210. Taking these estimates and applying it to the total number of workers exiting the labor force, calculated in table 2.1b, we arrive at the total direct cost faced by Washington businesses when childcare issues result in turnover. This is \$2.03 billion in employee compensation and represents roughly 0.7% of all employee compensation paid by businesses in the state.

Table 2.2. Direct Effects of Turnover

Worker Characteristics	Direct Effects
Total Compensation (billions)	\$299.7
Average Annual Compensation	\$68,646
Average Turnover Costs	\$14,210
Total Number of Exits	147,791
<i>Direct Cost of Turnover (billions)*</i>	<i>\$2.03</i>

*Estimates don't add due to rounding

2.3 Turnover Cost: Assumptions

A number of assumptions were necessary, due to imperfect information gained from the Washington childcare survey, ACS, and IMPLAN data. First, our team had no knowledge of the industry breakdown in which workers with children are employed in. Thus we had to assume that the parental labor force is representative of the entire state labor force. In other words, the burden of childcare is distributed equally across all sectors. We have no direct knowledge of which sectors are over/under represented, but it is likely that the burden is lower than average in some sectors, such as constructions, and higher in some, such as finance.

Second, we had no knowledge of the age in relation to a parent’s salary. It is likely that workers with younger children are younger adults, thus paid lower than that of the average in each sector. Without this knowledge we had to assume that all parents, regardless of age, were paid at the average.

Third, these numbers shouldn’t be taken as exact estimates. Results from the ACS and the Washington childcare survey are samples of the population all come with margins of error. While the ACS has a large sample size in Washington, the margin of error for the number of workers with children under the age of six is roughly 6,000. With the childcare survey drawing from a sample size of 400, the margins are likely to be much larger when estimating the shares leaving the workforce due to childcare.

3.0 Late for Work/Early Departures Costs Associated with Childcare Issues

The second portion of this study focuses on working parents arriving late to work or leaving early due to childcare issues. It employs the use of all data sources associated with the turnover calculation plus an average share of hours missed from work due to childcare issues. These estimates come from the Bureau of Labor Statistics (BLS). The BLS calculates the national average of lost worktime for reasons other than personal illness or injury as approximately 0.5% of hours worked. Causes in this category prominently feature “childcare problems,” although others are listed. To be conservative, this study uses half of the value of the BLS estimate in the following section.

3.1 Methodology

Using the same estimates found in the ACS, illustrated in table 2.1a and replicated again in table 3.1, we already know that there are an estimated 527,825 workers with children under the age of six. The Washington Childcare Survey indicated that, on average, 59% of the parents had arrived late or left work early due to childcare issues. This resulted in an estimated 311,417 workers, which was used as the base employment for calculating the shares of employment by sectors within IMPLAN. Our team applied the share of employment through IMPLAN’s 536 sectors to the 311,417 workers to obtain the total number of workers with

Table 3.1. Late to Work/Early Departures due to Childcare Issues

Worker Characteristics	Estimates
Workers with Children Under 6 Years	527,825
Share Late/Left Early	59%
<i>Workers Arriving Late/Leaving Early</i>	<i>311,417</i>

children under the age of six who had either arrived late or left early to work due to issues with their childcare. This was then multiplied by the overall average annual wage within each sector to arrive at the total compensation for workers with children under the age of six and missed time from work.

These estimates were then further reduced to 0.25%, our take of the BLS’s estimate on the hours missed as a percent of the hours usually worked for childcare issues. The only data garnered from the Washington Childcare Survey indicated whether a worker had or hadn’t arrived late/left early, but gave no reference to how much time was missed. Here the BLS provided a national average that our team employed. Applying this share to the total compensation of workers with children under the age of six who missed some time at work gave our team estimates on the total compensation related to those missed hours.

3.2 Late for Work/Early Departure Cost: Direct Effects

Across all sectors within the labor force there were nearly \$300 billion allocated to employee

compensation by businesses throughout the state, as depicted in table 2.2 and again in 3.2 below. Likewise, the average annual compensation was the same at \$68,646. However, the departure from the prior section comes from the number of workers. Here 59% of the workers with children under the age of six reported that they missed time from work due to childcare issues, resulting in 263,913 individuals.

Using IMPLAN labor compensation along with ACS and Washington Childcare Survey data, our team was able to estimate that there were roughly \$36.2 billion paid out to workers with children under the age of six. Of that sum, 59% reported missing some work, thus resulting in \$21.4 billion paid in compensation to individuals who missed work. We then reduced this number to reflect the share of hours missed, calculating the direct cost to businesses due to workers arriving late or leaving early as a result of childcare issues. This results in an estimated \$53.4 million in direct total employee compensation associated specifically to those hours missed.

Table 3.2. Direct Effects of Late to Work/Early Departures

Worker Characteristics	Direct Effects
Total Compensation (billions)	\$299.7
Average Annual Compensation	\$68,646
Total Number of Workers with Child Under 6 Missing Time	311,417
Total Compensation of Workers with Children Under 6 (billions)	\$36.2
Total Compensation of Workers with Children Under 6 Arriving Late/Leaving Early (billions)	\$21.4
<i>Direct Cost of Arriving Late/Leaving Early* (millions)</i>	<i>\$53.4</i>

*Estimates don't add due to rounding

3.3 Late for Work/Early Departure: Assumptions

As with the section focusing on turnover costs, the analysis on workers arriving late to work or departing early come with a set of assumptions as well, due to imperfect information. The first assumption still holds here. Our team had no knowledge of the industry breakdown in which workers with young children are employed. Thus we had to assume that the parental labor force is representative of the entire state labor force.

Second, we still have to assume that age of the parent didn't play a role in the salary. It is likely that workers with younger children are younger adults, thus paid lower than that of the average within each sector. However, without information on this relationship we had to assume all parents, regardless of age, were paid at the average.

Third, these numbers shouldn't be taken as exact estimates. The data we relied upon come from surveys with varying degrees with respect to the margins of error. Number should be taken as estimates.

Fourth, unique to the late and early departures analysis, our team had to assume that workers were not using vacation or sick leave when missing time from work. Within the Washington Childcare Survey there were no questions as to whether the time that an individual missed resulted in lost wages. Thus, these estimates reflect no use of vacation or sick leave and that assumes that all workers missed wages due to arriving late or leaving early. Again, this burden is most likely not equally distributed across the sectors. One would expect few available sick or vacation days in hospitality related businesses compared to more technical or professional sectors.

Finally, the analysis assumed that half of the hours lost in the BLS survey were due to "other reasons" childcare issues. While the footnotes to its table place childcare issues first, they also list time off for military service, maternity or paternity leave and "other family obligations." We had no way of ascertaining how important these other reasons were, and consequently applied the half of the value (0.25%) to childcare. The Institute doesn't know whether this is an under- or over-estimate. The resulting numbers are quite small, however, so the total effect of this uncertainty appears to be minimal.

4.0 Top 15 Industries Effectuated

Within the industry dataset, our team was able to provide a breakdown of the IMPLAN sectors that show the largest businesses costs associated with workers facing childcare issues. Here we have combined turnover costs and those arriving late or departing early to display the top fifteen industries ranked by total costs, in terms of employee compensation. These data can be found below in table 4. The total direct effects across both sections of the study result in an estimated total of \$2.079 billion in employee compensation costs to Washington businesses. The largest share, 7.2%, of this comes from local government workers at the cost of \$169.3 million. (This sector includes public education.) This is followed by software publishers at \$117.3 million (5%), federal government workers at \$104.5 million (4.5%), wholesale trade at \$102.4 million (4.4%), and aircraft manufacturing at \$86.7 million (3.7%). The leading five industries account for roughly a quarter of all the direct costs facing Washington industries; the top fifteen account for nearly half.

Table 4. Top 15 Industries Effectuated by Direct Costs

IMPLAN Sector	Total Direct Cost*	Share of Direct Cost
Local Government	\$150.0	7.2%
Software Publishers	\$103.9	5.0%
Federal Government	\$92.6	4.5%
Wholesale Trade	\$90.7	4.4%
Aircraft Manufacturing	\$76.8	3.7%
State Government	\$75.9	3.7%
Non-store Retailers	\$70.3	3.4%
Hospitals	\$59.4	2.9%
Offices of Physicians	\$45.1	2.2%
Management of Companies & Enterprises	\$40.5	1.9%
Real estate	\$35.6	1.7%
Custom Computer Programming Services	\$34.4	1.7%
Scientific Research & Development Services	\$33.3	1.6%
Architectural & Engineering Services	\$27.0	1.3%
Internet Publishing & Broadcasting	\$26.4	1.3%
<i>All Sectors</i>	<i>\$2,078.5</i>	<i>--</i>

*Values represented in millions

5.0 Comparison to Other Studies

This study follows in the analytical framework produced in the states of Louisiana and Georgia. The research conducted by Davis, Bustamante, Bronfin, and Rahim (Louisiana study) addresses two questions: what is the cost associated to businesses of parents leaving the workforce due to childcare issues, and the cost associated with absences due to childcare issues. The first question very much aligns with our study; however, this study differs with regards to absenteeism. Ours focuses on the *partially* missed days, whereas the Louisiana study analyzes lost compensation due to *entire* days absent from the workforce. The latter question could be answered for Washington if additional data was available on the average number of days missed by parents in the workforce.

The other key difference with the Louisiana study is that their children's age differs from that of this research. The focus of Louisiana childcare issues lies with parents who have children age four and under, whereas this study conducted in Washington, expands the parental workforce to individuals with children age five and under. This is a result of how the question was worded on the Washington Childcare Survey and aligns more closely with the ACS data on the distribution of age of those in the workforces with children.

Our team believes that our study is comparable to that of done in Louisiana when making adjustments for relative differences between the size of Washington's and Louisiana's economy. According to the Bureau of Economic Analysis (BEA), the regional gross domestic product of Louisiana was roughly 46% the size

of Washington's. The Louisiana study reported a direct cost due to turnovers to be about \$875.3 million compared to ours of \$2.03 billion. The direct costs to Louisiana businesses are approximately 42% of the costs facing Washington businesses, reflecting a similarity in the size difference between the two economies as a whole. This leads our team to believe that our estimates are credible reflections of the costs facing Washington businesses.

6.0 Total Effect, "Opportunity Costs" Facing Businesses

The remainder of this analysis addresses the missed opportunity facing Washington businesses when they are forced to dedicate limited resources on issues surrounding childcare. These estimates represent *opportunity costs*, or generally the loss of potential gain from choosing one alternative to the other. In this case, businesses are paying costs of rehiring employees and missed production due to lost hours and the analysis asks the hypothetical question of *what if that was diverted to production instead?*

The analysis above depicts the direct effects, that is, what has already happened in the economy but provides no calculations of additional rounds of spending via businesses to business interactions or subsequent consumer spending. If those lost costs of childcare-related disruptions were converted into productive uses, there are potential additional gains to the state's total employment and value added, or the state gross domestic product (GDP). GDP, in the simplest of terms, is a measure of all the spending conducted by households, businesses, and government agencies, counted a various stage of the production process. Using IMPLAN software our team was able to estimate out those additional gains in the State economy in

terms of employment, labor compensation and GDP. However, it is to be noted that these calculations will represent the upper limits on the impacts to the economy in which 100% of employee compensation associated with turnover and missed time of work were used for increasing output.

IMPLAN is an economic input-output modeling program used to study the interactions between producers and final users in the economy. Input-output models are able to capture not only the initial spending and labor effects of an entire sector or an individual firm, but all subsequent rounds of spending throughout a regional, state, or national economy.

The first round of economic activity resulting from a firm's operations is referred to as the *direct effects*. These are tallied in the prior sections. The difference between the final and first-round effects rests on two types of intermediate reactions. The *indirect effects* develop from any purchases the firm undertakes from other businesses, business to business transactions. *Induced effects* represent all the spending by consumers from the additional earnings received in both the direct and indirect effects.

Using the IMPLAN model, changes to an economy by a firm or a sector's actions can be introduced by modifications to the labor count, sales, or in this case, labor income. This study modified all 536 sectors with firms operating in Washington, by increasing the labor income by that found in the calculations above: \$2.03 billion related to turnover costs and \$106.9 million in missed hours of work. The total effect, or *opportunity costs*, facing Washington businesses statewide can be found in the following tables.

6.1 Opportunity Cost: Turnover

Using the labor income of \$2.03 billion, estimated in section 2.2, divided across the 536 IMPLAN sectors, our team was able to calculate the following total effects of missed growth on

the State economy due to firms facing employee turnover associated with childcare, either the firm letting the individual go or the individual quitting. Depicted on table 6.1 are these effects in the form of employment. Across the State, if the labor costs lost due to turnover

Table 6.1a. Employee Turnover Opportunity Costs of Employment

Impact	Employment	FTE Conversion
Direct Effect	39,481	33,507
Indirect Effect	12,851	11,841
Induced Effect	13,725	12,239
<i>Total Effect</i>	<i>66,058</i>	<i>59,588</i>

were converted to productive means the labor market could support 66,058 jobs, 39,481 of those coming from the direct labor costs facing Washington businesses. Also included in table 6.1a is the conversion of these jobs to fulltime equivalents (FTE). As there is considerable variation from industry to industry in hours per employee, our team has converted these jobs, on a sector by sector basis, to FTEs. As a result, the 66,058 jobs represent a total 59,588 FTEs; 33,507 coming from the direct reinvestment of lost labor compensation, 11,841 coming from additional spending in businesses to business transactions (indirect effects), and 12,239 due to increased consumer spending based on the additional income (induced effects).

In addition to gains made in employment, compensation should be considered. It forms the largest part of the calculations of state GDP.

Table 6.1b shows the total effects in relation to employee compensation and value added, a measure equivalent to the state gross domestic product (GDP). The direct effects calculated in section 2.2 for labor compensation resulted in an estimated total effect of \$3.6 billion in employee compensation across the state. This is roughly an additional \$1.58 billion gained from the hypothetical reinvestment of the \$2.03 billion lost in labor compensation from turnover due to childcare issues; roughly \$836 million coming from gains resulting from business to business transaction and \$743 million from additional consumer spending.

This reinvestment would add an additional \$6.35 billion to the State's gross domestic product, with just over half coming directly from the reinvestment of those sunk funds in labor costs associated with employee turnover.

Table 6.1b. Employee Turnover Opportunity Costs of Employment Compensation

Impact	Employee Compensation	Value Added
Direct Effect	\$2,025.1	\$3,612.2
Indirect Effect	\$836.7	\$1,374.9
Induced Effect	\$743.2	\$1,364.5
<i>Total Effect</i>	<i>\$3,604.9</i>	<i>\$6,351.5</i>

*Values represented in millions

6.2 Opportunity Cost: Late to Work/Early Departures

Using the same methodology outlined above, with the direct costs in the form of labor compensation estimated in section 3.2, we depict the opportunity costs in table 6.2, with relation to employment, confronting businesses in Washington from employees arriving late or departing early from work because of issues surrounding lack of adequate childcare. Across

the State, if the labor costs lost due to missed time from work were converted to productive means, the labor market could support 1,741 jobs, 1,041 of those coming from the direct labor costs facing Washington businesses. This equates to 1,570 FTEs, once adjusting for differences between industries. An additional 311 FTEs are supported through business to business transactions and 322 from additional consumer spending.

Table 6.2a. Late to Work/Early Departures Opportunity Costs of Employment

Impact	Employment	FTE Conversion
Direct Effect	1,041	936
Indirect Effect	338	311
Induced Effect	361	322
<i>Total Effect</i>	<i>1,741</i>	<i>1,570</i>

Table 6.2b shows this same economic impact but through the lens of employee compensation and value added, or state GDP. The direct reinvestment of the labor compensation would result in an additional \$167.6 million in Washington GDP overall,

where \$36.3 million came from businesses to business transactions, and \$36.0 million came from additional consumer spending. Of the additional \$167.6 million, \$95.1 million comes from the additional labor compensation, accounting for 57% of the GDP gains.

Table 6.2b. Late to Work/Early Departures Opportunity Costs of Employee Compensation

Impact	Employee Compensation	Value Added
Direct Effect	\$53.4	\$95.3
Indirect Effect	\$22.1	\$36.3
Induced Effect	\$19.6	\$36.0
<i>Total Effect</i>	<i>\$95.1</i>	<i>\$167.6</i>

*Values represented in millions

6.3 Opportunity Cost: Combined Effects

Combining the data from section 6.1 and 6.2 provides the results for the total effects, or opportunity costs, facing Washington businesses with workers experiencing any kind of employment disruptions due to issues surrounding childcare constraints. Table 6.3a

shows that the reinvestment of these funds could support an upper bound of 67,799 jobs, or 61,158 FTEs. Table 6.3b shows this same data but in terms of employee compensation and value added (GDP). An additional \$3.7 billion of labor compensation would be paid out to workers throughout the state, contributing over \$6.5 billion to the state’s GDP.

Table 6.3a. Opportunity Costs, Measured by Employment

Impact	Employment	FTE Conversion
Direct Effect	40,522	34,443
Indirect Effect	13,189	12,152
Induced Effect	14,086	12,561
<i>Total Effect</i>	<i>67,799</i>	<i>61,158</i>

Table 6.3b. Opportunity Costs, Measured by Employee Compensation

Impact	Employee Compensation	Value Added
Direct Effect	\$2,078.5	\$3,707.5
Indirect Effect	\$858.7	\$1,411.2
Induced Effect	\$762.8	\$1,400.5
<i>Total Effect</i>	<i>\$3,700.1</i>	<i>\$6,519.1</i>

*Values represented in millions

6.4 Opportunity Cost: Top 15 Industries Effected

The final portion of this analysis looks at the top industries impacted by the reinvestment of labor compensation lost due to employment issues stemming lack of childcare. The top fifteen industry list, found below in table 6.4, differs from the one found in section 4 in a few ways. Section 4 is only looking at the direct costs facing businesses as a result of workings

dealing with childcare issues, or the estimated costs businesses incur due to lost productive when somebody quits or is terminated and the loss of productivity surrounding missed hours of work. Table 6.4 looks at of the top fifteen industries by the additional supported employment resulting from the summation of the indirect and induced effects. In other words, these are the industries that benefit down the line of spending when changes occur in direct effects.

Table 6.4. Top 15 Industries Effected by Employment and Labor Compensation

IMPLAN Sector	Employment Gains	Share of Total Employment Gained
Real Estate	1548.6	6.3%
Wholesale Trade	1082.4	4.4%
Employment Services	779.4	3.2%
Full Service Restaurants	752.5	3.0%
Limited Service Restaurants	606.3	2.5%
Hospitals	569.6	2.3%
Insurance Agencies & Brokerages	558.2	2.3%
Management of Companies & Enterprises	470.2	1.9%
Services to Buildings	469.1	1.9%
Management Consulting Services	458.4	1.9%
Support Activities for Agriculture & Forestry	450.5	1.8%
Other Financial Investment Activities	429.7	1.7%
Maintenance of Nonresidential Structures	418.2	1.7%
Individual and Family Services	406.4	1.6%
Accounting, Tax Preparation, & Payroll Services	396.8	1.6%
<i>All Sectors</i>	<i>24,715.3</i>	<i>--</i>

*Employment based on FTE

There is some overlap in the industries with the highest direct costs as well as those who would receive the largest benefit in employment growth reinvesting those costs. Real estate, wholesale trade, hospitals, management of companies and enterprises, all show up on both lists. These top fifteen sectors account for 9,396 FTEs, or nearly 40% of all the FTEs supported through the indirect and induced effects with the top five accounting for 4,769, or nearly 20%. These leading industries reflect many of the support services in the state's economy, driven largely by the indirect, or business to business transactions. Two sectors of importance that show up here are full and limited service restaurants. While these two industries don't have high direct costs associated with childcare they benefit greatly in the number of additional FTE employees they could support if Washington businesses didn't incur the direct

costs associated with a workforce constrained by childcare issues.

6.5 Opportunity Costs: Assumptions

This study assumes that the entirety of the lost labor compensation, estimated as direct costs and used as inputs, were fully reinvested into the firm. Our team has no knowledge of the rate at which individual businesses would save or reinvest cost savings from employees no longer constrained by issues of finding childcare. As we assume that these funds are fully reinvested, these estimates represent the upper bounds of estimates of additions to the State economy.

All the assumptions built into the direct effects are also at play here. Again, because the direct costs are used as inputs for the opportunity cost estimates, all of the assumptions found in sections 2.3 and 3.3 apply here as well.

Therefore, any margins of error or lack of industry knowledge influence the total effects here as well.

7.0 Additional Points of Study

While this study expands upon prior studies done in Georgia and Louisiana by taking into account industry differences, there are a couple areas in which it could be improved.

A few questions could be added to the Childcare Survey of Washington Parents pertaining to the amount time missed from work would be helpful. Knowing a rough estimate about the number of hours they miss

in a month due to arriving late or departing early from work would provide a more accurate and localized estimate than the national average taken from the BLS.

Another future step in this study could be look at those parental workers who have been absent an entire workday. Were data from the Washington Childcare Survey available, our team could estimate absenteeism based on the average number of days missed due to childcare issues. This would include those missing partial days from work, providing a richer analysis. Having this portion would hit all variation in which childcare issues can impact workers and thereby the performance of their employers.

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