



LINKING ECONOMIC DEVELOPMENT AND CHILD CARE RESEARCH PROJECT
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Child Care Multipliers: Analysis from Fifty States

By Zhilin Liu, Rosaria Ribeiro and Mildred Warner, 2004

ECONOMIC IMPORTANCE OF CHILD CARE IN THE REGIONAL ECONOMY

Economists and planners are recognizing the important contributions the early care and education sector makes to the economy in both the short and long terms. Across the country, states and localities are using regional economic analysis to estimate the size of the early care and education sector and the extent of its linkages in the broader regional economy. A complete data base of these studies is found on the Cornell Linking Economic Development and Child Care project website. This research brief presents a summary of the regional linkages of child care in all 50 states and the District of Columbia.*

Calculating the extent of linkage of the child care sector in the regional economy, as captured in the sector's multipliers, is the primary focus of this report. However, the economic importance of early care and education is not limited to this effect. The economic importance of child care has three components as illustrated in the trillium flower above: its effect on places (the regional economy), its effect on parents (social infrastructure supporting workers and their employers), and its effect on children (investing in human development and education for a productive future workforce).

Economic development policy often is influenced by estimates of multiplier effects in the broader regional economy. Such estimates are derived from input-output models which develop a matrix of all sectors in the economy and the inter-industry linkages between them. In this brief we map how these multiplier effects differ across states and across sectors in state economies. The full report, on which this research brief is based, also explains how the IMPLAN input-output model is structured and what impact this has

on the child care results. It includes detailed tables of multiplier comparisons for every state. Only averages are reported here.

One reason policy makers are interested in short-term regional economic effects is because traditional economic development policy is based largely on short-term goals. Linkage or multiplier effects help economic developers determine which economic sectors will have the greatest total impact on the regional economy given an increase in final demand for a given sector's output.

We find the child care sector has linkages to the rest of the economy that are equally strong or greater than retail and tourism and other social infra-structure sectors such as hospitals, job training, elementary and secondary schools and colleges and universities. This comparability reflects the labor intensive nature of all of these sectors and similar production relationships in the regional economy. While some of these sectors are targets for economic development policy, child care typically is not. Cornell's Economic Development Strategy Guide gives examples of how child care could be a part of economic development policy.

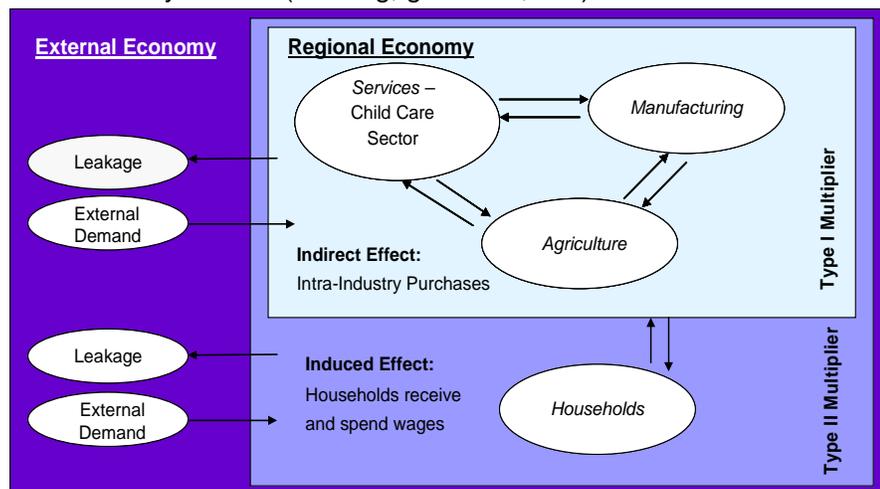
INPUT-OUTPUT ANALYSIS

Similar to other economic sectors, child care contributes to the regional economy not only through its direct employment and output, but also through its purchases of goods and services that stimulate economic activity in other industries. Multipliers generated from input-output models measure the relative strength of these purchases, or backward

The child care sector's relatively high economic linkage suggests the sector could be a competitive target for economic development attention.

*Based on Liu, Z., R. Ribeiro, and M. Warner, 2004. *Comparing Child Care Multipliers in the Regional Economy: Analysis from 50 States*. Ithaca NY: Cornell University Department of City and Regional Planning. Full copies of the report complete with detailed tables showing modeling results for each of the 50 states are available at <http://economicdevelopment.cce.cornell.edu>.

linkages, to the regional economy. There are two types of linkage effects that multipliers capture. *Indirect effects* count the multiple rounds of inter-industry purchases spurred by industry spending. For example, child care businesses purchase food and supplies from other industries, in turn stimulating further input purchases by those industries. *Induced effects* capture the impact of household spending. Employees spend their wages in the larger economy and these expenditures, in turn, generate demand in other industry sectors (housing, groceries, etc.).



Type I multipliers treat households as exogenous to other economic activity in the studied economy, and account only for the direct effects of the child care sector and the indirect, inter-industry effects of industry purchases. Type II multipliers include the direct, indirect, and induced effects (i.e. employee spending that changes in concert with changes in economic activity in the studied economy), and are used to calculate the impact of a change in external demand for child care (such as increased federal spending in a state economy).

Multipliers are most commonly measured and most easily understood in terms of output and employment. An *output multiplier* for the child care industry estimates the total sales that would be generated in the entire economy by each dollar of increased direct spending for child care services. The *employment multiplier* is an estimate of the gross number of jobs that would be created throughout the regional economy from an increase in demand for child care services large enough to stimulate the addition of one new job in the child care industry.

Methodological Challenges: Input-output models allow us, first, to describe the patterns of linkage between different sectors in the regional economy. Secondly, they allow us to assess the impact of changes in exogenous demand. Methodological challenges in applying input-output analysis to service sectors such as child care stem from the second, impact-oriented approach.

Input-output models were originally built to study the impacts of export-based extractive and manufacturing sectors. There is a limit to their ability to measure the impact of service sectors, such as child care, where demand is primarily local – from households. However they are useful as a descriptive tool to describe the relative strength of backward linkage in the regional economy.

With the growth in service sector employment, more attention has been focused on the economic impact of services. Services like child care may be more important for their forward linkages (output sales that enable other sectors to produce), than the backward (purchase) linkages measured by multipliers. The Cornell team is measuring sectoral importance in terms of both backward and forward linkages using the hypothetical extraction approach (Pratt and Kay 2004), but that work is still experimental and not yet part of practical economic policy debates.

Multipliers, or backward linkages, are the focus of this report. For a more detailed discussion of input-output modeling, methodological issues and multipliers, see (Ribeiro & Warner 2004).

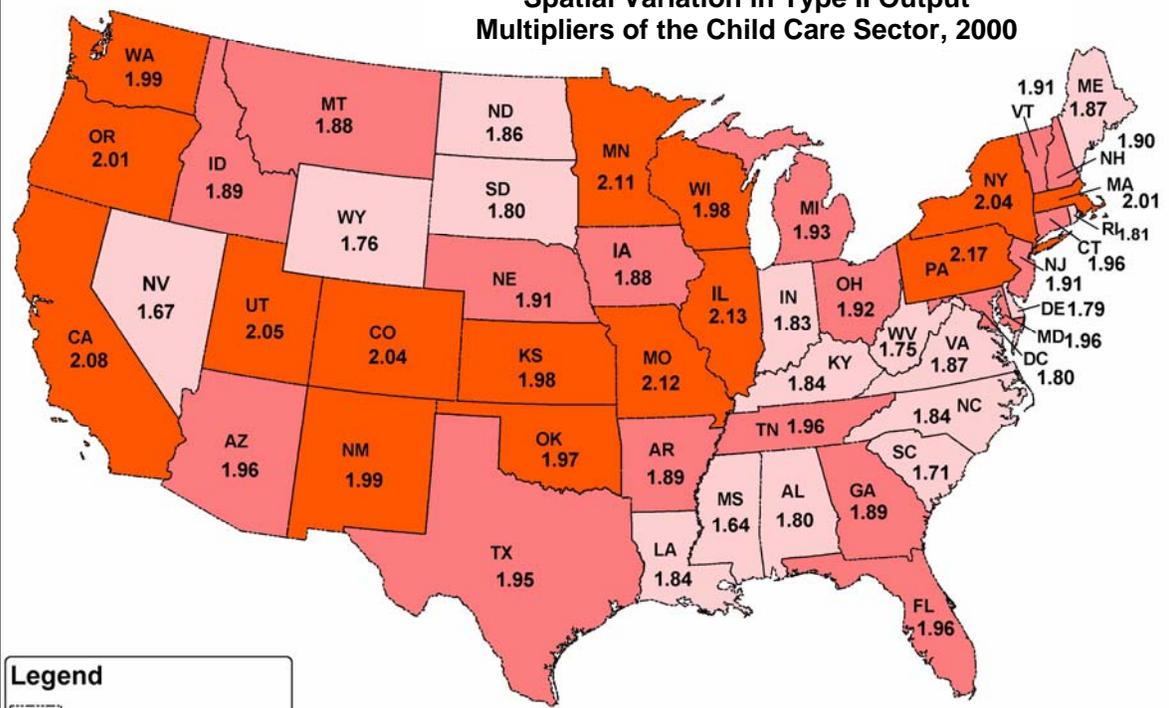
Our Approach: We construct input-output models for each of the 50 states and the District of Columbia based on data from 2000. We then provide a comparison across states and across sectors. We look inside the IMPLAN model to see how it treats the child care sector in particular. Brief highlights of those analyses are presented here.

ANALYSIS ACROSS STATES

The map of Type II output multipliers shows those states with larger economies such as California, New York and Pennsylvania, tend to have higher multipliers. But a look at the map shows important exceptions - Utah, Oregon and New Mexico. (See map). These states have smaller economies but relatively high Type II output multipliers indicating greater self sufficiency. Isolation due to geographic features (mountains, ocean) may reduce leakage and lead to larger multiplier effects. In general, we find regional economic linkage from child care business purchases is greater than from household purchases. States with smaller economies are more likely to see household spending leak out of the state economy.

Similar spatial variation also exists in the child care employment multipliers, though the distribution is not as wide. States with lower output multipliers also tend to have lower employment multipliers. Many of the southeastern states are low on both maps.

Spatial Variation in Type II Output Multipliers of the Child Care Sector, 2000

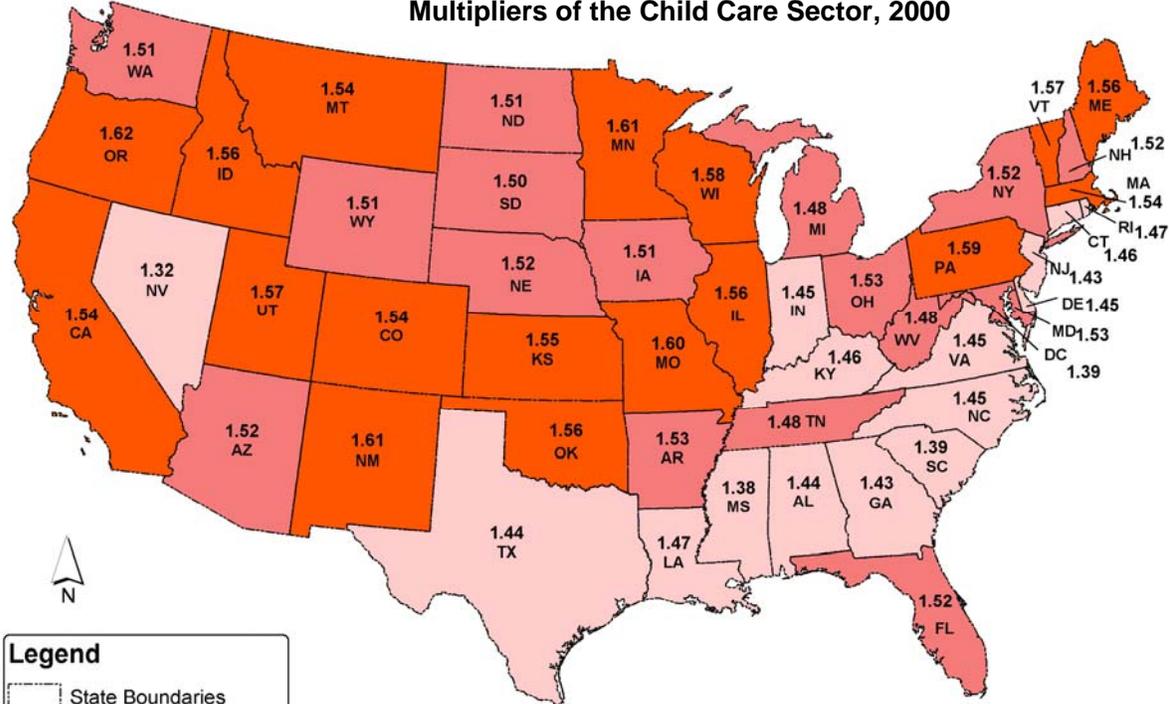


Legend

- State Boundaries
- Multipliers (Mean=1.91)**
- Lower third: 1.64 - 1.87
- Middle third: 1.88 - 1.96
- Upper third: 1.97 - 2.17

Source: IMPLAN, 2000 - 50 States plus DC analysis

Spatial Variation in Type II Employment Multipliers of the Child Care Sector, 2000



Legend

- State Boundaries
- Multipliers (Mean=1.50)**
- Lower third: 1.32 - 1.47
- Middle third: 1.48 - 1.53
- Upper third: 1.54 - 1.62

Source: IMPLAN 2000 - 50 states plus DC analysis

In states with policies that promote quality child care, we find higher child care multipliers, suggesting that quality is associated with higher levels of regional spending by child care providers and workers. Lower child:staff ratios, higher child care worker wages, higher subsidy reimbursement rates and higher government investment overall are positively correlated with higher output multipliers. This suggests a mutually reinforcing relationship between regional economic linkage and child care quality.

Investments in child care can have a positive long term effect on the industry (by increasing effective demand and giving stimulus for quality), and a positive short term effect on the broader state economy as well.

ANALYSIS ACROSS SECTORS

Child care tends to have higher backward linkage than most other sectors in the state economy as measured by its Type II output multiplier which ranks in the 93rd percentile across all economic sectors. This means that compared to other economic sectors, child care purchases more of its inputs locally, and expenditures on child care circulate longer in the state economy. Child care Type II output multipliers tend to be higher than median multipliers of Agriculture, Manufacturing, and Services. The percentile rank for the employment multiplier is much lower (19th percentile), reflecting the

Sectors	Output Multipliers		Employment Multipliers	
	Type I	Type II	Type I	Type II
Child Care	1.49	1.91	1.27	1.50
Private Elem. & Secondary Schools	1.30	1.91	1.10	1.31
Job Training	1.32	1.84	1.23	1.50
Colleges and Universities	1.22	1.84	1.09	1.37
Hospitals	1.25	1.79	1.19	1.67
Local Interurban Passenger Transit	1.26	1.72	1.10	1.35
Wholesale	1.22	1.62	1.28	1.86
Retail: Apparel & Accessory Stores	1.22	1.60	1.10	1.30
Business Services: Mgmt. Consulting	1.34	1.81	1.38	1.91
Tourism: Hotels and Lodging	1.31	1.71	1.21	1.50
Manufacturing: Tool and Die	1.19	1.63	1.17	1.71
Averages from models of 50 states and the District of Columbia (N=51), based on IMPLAN 2000 data.				

labor intensive nature of child care relative to the sectors from which it purchases inputs.

We compare child care output and employment multipliers to those of other social infrastructure sectors (job training, education, hospitals, transit) and find child care is very similar. Whereas these sectors are considered important targets of economic development policy, the child care sector is not. Child care multipliers also are similar to our benchmark retail and tourism sectors. All of these sectors are important sources of local employment; however, child care tends to purchase more of its inputs locally, and thus typically has multipliers that are somewhat higher. Relative to sectors more typically considered export-oriented (such as wholesale, manufacturing and producer services), child care compares favorably on output multipliers though its potential for sales outside the region is limited. Child care's employment multipliers are lower because child care tends to purchase more of its inputs from relatively less labor intensive sectors. Warner and Liu (2004) provide a more complete discussion of multiplier comparisons.

CONCLUSION

Regional economic analysis shows child care is a good economic development investment, both for its direct effects on employment and its relatively high linkage effects in the regional economy. The relative rank and size of this economic linkage calls for greater economic development attention be given to the child care sector. This, in addition to the sector's importance as social infrastructure supporting parent workers and human development of the future workforce, makes it a worthy target for economic development policy.

SELECTED REFERENCES

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The reports above and a full version of the report on which this research brief is based, complete with tables comparing multipliers for every state, are available on the Cornell web site. <http://economicdevelopment.cce.cornell.edu>

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