ECONOMIC DEVELOPMENT THROUGH SOCIAL WELFARE: UNRAVELING THE ECONOMIC SIGNIFICANCE OF THE SOCIAL ASSISTANCE SECTOR IN 2017 NEW YORK STATE

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ABSTRACT

This thesis employs the input-output (IO) model to quantify the economic significance of the social assistance sector in 2017 New York state's economy. Results demonstrate that investments in this sector have moderate indirect impacts due to limited inter-sectoral purchases. However, when households are endogenized as an economic sector, the social assistance sector yields notably high induced impacts. These high induced impacts are attributable to the sector's high labor compensation and workers' predominantly local spending. By comparing the social assistance sector with other industries, this thesis contests the economic base theory and challenges the embedded biases in IO multiplier calculations. It ultimately posits that the social assistance sector holds significant value for regional economy, labor mobilization, and human development. Though the latter two concerns cannot be measured in the IO model, the sector continues to demonstrate substantial contributions to the regional economy, underscoring its importance in the broader economic framework.

BIOGRAPHICAL SKETCH

Junbo Huang is currently a candidate for a Master of Science in Regional Science (expected in August 2023) in the Department of City and Regional Planning at Cornell University. He has developed his research interests in affordable housing, urban infrastructure, land use planning, and zoning from practical experiences with local governments and Chinese large cities. He holds a Master's degree in Landscape Architecture from Peking University in Beijing and a Bachelor of Landscape Architecture from Huazhong Agricultural University in Wuhan.

This thesis is dedicated to my wife, whose love and support have been my anchor.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Chapter 1. Introduction

The service industry is the largest economic component in the US, but not all services are considered equally important. Development economists argue that skill-intensive and export-oriented service industries primarily drive growth in the US service economy (Buera & Kaboski, 2012). In contrast, local service industries are regarded as supportive but not exportable, adding less value to economic growth. This perspective aligns with the Economic Base theory, which classifies industries into basic and non-basic categories. Basic industries, being export-oriented, invigorate an economy by attracting outside capital; while non-basic industries largely depend on basic industries.

Policymakers often lean on this theory to emphasize the economic importance of high-skill and high-profit industries that reach external markets. These industries are considered essential for attracting outside resources, creating jobs, and generating incomes. By contrast, social assistance services are often underestimated, as they focus on providing aid to low-income and low-skill individuals and households and do not have external markets. Consequently, the social assistance sector is commonly perceived more as a cost of social welfare than as an industry with significant economic value.

Nevertheless, the social assistance sector is important for the economy. They can boost local economic activity, improve local workforce capability, alleviate poverty and income inequity, and enhance social cohesion. For example, child day care services can increase employment capability by relieving parenting burdens and promote gender equity as women generally bear more parenting burdens (Folbre, 2006; Warner, 2006). Vocational

rehabilitation services can help individuals develop necessary skills for gainful employment, enabling disadvantaged populations to participate in the local economy (Dutta et al., 2008). Community food and housing services stimulates the local economy by purchasing local goods and food and providing secure living environment for vulnerable people (Pothukuchi, 2004; Wardrip, Williams, & Hague, 2011).

This study intends to highlight the economic significance of the social assistance sector in New York State in 2017. As classified by the North American Industry Classification System (NAICS), the social assistance sector encompasses four sub-sectors and provides services include: individual and family services, community food and housing and emergency and other relief services, vocational rehabilitation services, and child day care services. All these subsectors are dedicated to serving local individuals and households undergoing poverty and hardships. We suggest reframing the economic significance of this sector, viewing it not only as a mechanism for achieving social justice but also as an important force for invigorating local businesses.

This study uses the input output (IO) model to quantify the economic importance of the social assistance sector to the local economy. The IO model is useful to illustrate the circulation of goods and services within an economy and measure economic impacts of interested sectors. Using 2017 IO data and BEA employment and income data for New York State, this thesis deconstructs the total economic impacts of a $1-million demand on the social assistance sector into direct, indirect, and induced impacts. By doing so, this thesis

explains how the social assistance sector benefits the economy and identifies who can benefit from this sector.

The subsequent chapter will review literature on the economic base theory, service economy, and IO studies. Chapter 3 presents the IO table and employment and income data sources and introduces the North American Industry Classification System (NAICS) code to detail the social assistance sector. Chapter 4 expounds on the mathematic formulas for calculating indirect and induced impacts and multiplier effects within the IO model. Chapter 5 analyzes calculation outcomes and clarifies why the social assistance sector yields limited indirect impacts but very high induced impacts. Chapter 6 identifies the limitations of the economic base theory and the IO model and discusses the risks and strategies of using SIBs as a financial mechanism for investing in the social assistance sector. The concluding chapter summarizes all findings of this thesis.

Chapter 2. Literature Review

2.1 Economic base theory

The economic base theory, originating from the North-Tiebout debate on regional economic growth (North, 1955; Tiebout, 1956a), analyzes and predicts the performance of economies with simple industrial structures. This theory classifies industries into basic and non-basic sectors, depending on whether they are export-orientated or not. This theory argues that basic sectors hold greater economic significance than non-basic ones, as basic sectors bring external income into an economy, while non-basic sectors depend on basic ones for development (Conway, 2022).

The economic base theory is straightforward and effective for informing economic impact analyses and regional development policies. Conway (2022) applied the economic base theory to elucidate the economic impacts of the aluminum industry in Klickitat County, Washington, in 2003. His calculations reveal that the exporting aluminum industry created one-seventh of the whole county's economy. This case study exemplifies how economic base theory can be used to forecast and explain economic contributions of exporting industries within an economy. However, the economic base theory oversimplifies economic structures, neglecting the complex interdependencies among industries and undervalues the importance of local demand. For instance, Kay, Pratt, and Warner (2007) expressed the vital economic significance of local services. Their research on the 2001 New York State economy revealed that local service sectors played a pivotal role by inducing and facilitating economic

activities within the economy, as household consumption predominantly comprises local services.

2.2 Service Economy

Service industries have long been the largest and most critical sectors worldwide, which has prompted policy makers to acknowledge the critical role of service industries in economic development (Nayyar, Hallward-Driemeier, & Davies, 2021). Specifically, skill-intensive service industries, such as FIRE (finance, insurance, and real estate) and professional services, are acknowledged as driving forces for economic growth due to their high added value and export potential (Buera & Kaboski, 2012). This perspective continues to view service industries through the lens of the Economic Base theory, emphasizing external demands and exporting attributes. On the contrary, local services are often perceived as lacking added value and external markets. Thus, policy makers tend to underestimate the economic importance of local services. But as Tiebout (1956b) argued, communities with high-quality local services and amenities can attract residents who contribute to local economic growth through their consumption and investments.

The social assistance sector provides important local services and amenities, such as child day care and vocational rehabilitation services, for local people and households who are experiencing poverty and hardships. Numerous studies have highlighted the importance of social assistance services and its contributions to overall community well-being (Peck, 2012). For example, child day care is considered as a critical social infrastructure that promotes local economic development. It enables parents to partake in economic activities

and fosters long-term human development of children (Warner, Ribeiro, & Smith, 2003; Folbre, 2006; Warner, 2006). Echoing these economic narratives of social assistance services, this study employs the input-output model to analyze the contributions of the social assistance sector to the economy.

2.3 Input output model

The input-output (IO) model has been extensively applied to calculate economic impacts and multiplier effects of various industries (Miller & Blair, 2009). The IO model encompasses Type 1 and Type 2 models. The Type 1 model measures indirect effects, whereas the Type 2 model captures induced effects by endogenizing households as an industry engaged in inter-industrial transactions. The Type 1 total impacts equal the sum of direct and indirect effects. The Type 2 total impacts equal the sum of direct, indirect, and induced effects (Horowitz & Planting, 2006). Multipliers are then calculated by dividing Type 1 or 2 total impacts by the direct effects (Richardson, 1985; Miller & Blair, 2009). IO studies have reported relatively low output and employment multipliers effects for the child day care sector in 2000 New York state (Pratt & Kay, 2006; Warner & Liu, 2006; Liu & Warner, 2009).

Multipliers are useful to compare the ripple effects caused by a unit change across different industries. However, multipliers may underestimate the industries with large direct effects. For example, given the same investment, industry A generates 1 job within itself and 2 jobs in other industries, and its employment multiplier is 3. In contrast, industry B generates 2 jobs within itself and 1 job in other industries, leading to an employment multiplier of 1.5.

Since both have 3 total employment impacts, does industry A hold more economic significance than industry B? An alternative approach involves separating direct, indirect, and induced effects. This allows for a different perspective on understanding an industry's contribution to the economy. IO analysis typically focuses on assessing backward linkage effects across industries, often overlooking forward linkages. Research on child day care industries has shown that social assistance services can have significant enabling values (Folbre, 2006; Kay, Pratt, & Warner, 2007), which extends beyond the scope of this study.

Chapter 3. Data Sources

3.1 NAICS code of the social assistance sector

This thesis focuses on the social assistance sector among the 67 industries in the IOsnap dataset. The social assistance sector provides aid to individuals and households experiencing poverty and hardships, as well as services to child day care, elderly individuals, people with disabilities, abused women, and other vulnerable groups (NAICS, 2017). According to the 2017 NAICS code, the code for the social assistance sector is 624. This sector comprises four four-digit sub-sectors, including 6241 individual and family services, 6242 community food and housing and emergency and other relief services, 6243 vocational rehabilitation services, and 6244 child day care services. Google Sheets 1 introduces detailed information for the social assistance sector. This sector primarily serves local households and communities and heavily relies on public subsidies. To create a meaningful contrast, this thesis highlights three other sectors to compare their economic impacts with those of the social assistance sector. The first is the sector of funds, trusts, and other financial vehicles (NAICS code 525), recognized as one of the most lucrative service industries. The second is the real estate sector (NAICS code 531), the sector with the largest total output in 2017 in New York State. The third one is the machinery sector (NAICS code 333), which is an export-oriented manufacturing industry.

3.2 Input output data

This paper uses 2017 input-output (IO) data to examine the economic significance of the social assistance sector in New York State. 2017 IO data is one of the benchmark years for

IO data collection, ensuring greater accuracy. The input-output data is sourced from the software IOsnap, which regionalizes the US national IO data from the Bureau of Economic Analysis for the corresponding year (Jackson & Járosi, 2022). The IO data used in this study can be found in Google Sheets 2, which presents the transactions of goods and services among 67 industries in New York State during 2017. This IO data shows that the social assistance sector has $22 billion total output and sells $17 billion to households. This indicates 77% total output in this sector is consumed by households, only 23% goes to other industries. Table 1 contrasts this ratio of household consumption to total output in the social assistance sector with three other sectors, with numbers in parentheses denoting the rank among all 67 sectors in New York state.

Table 1. The ratio of household consumption to total output for various sectors

Sector	Total output (Mil. $)	Household consumption (Mil. $)	Ratio of household consumption to total output
social assistance	22,678 (27)	17,445 (16)	76.9% (5)
funds, trusts, and financial vehicles	16,593 (34)	13,042 (19)	78.6% (4)
real estate	288,779 (1)	117,119 (1)	40.6% (18)
machinery	13,898 (36)	245 (53)	1.8% (59)

3.3 Employment and income input coefficient

The full-time employment data used in this research is sourced from the 2017 BEA dataset. The income data is also obtained from the 2017 BEA dataset and encompasses income sources such as wages and salaries, social security, government benefits, dividends, interest,

business ownership, and other miscellaneous sources (BEA, 2017). The employment and income data for some sectors in 2017 are inaccessible or not reported due to confidentiality reasons. To address this issue, the analysis uses data from previous years as a substitute for the unavailable 2017 figures. Google Sheets 3 displays the compiled total output, employment, and income data of 67 industries in 2017 New York state, as well as their employment and income input coefficients. For instance, the social assistance sector has $22,677 million total output and $10,144 million total labor income with 398,689 full-time jobs, indicating this sector hires 17.580 full-time workers for each million output and spends about $0.447 million as labor compensation. Table 2 showcases employment and income input coefficients of other three sectors to make a comparison with those of the social assistance sector.

Table 2. Employment and income input coefficient for various sectors

Sector	Total output (Mil. $)	Total employment (person)	Employment input coefficient (person / Mil. $)	Total labor income (Mil. $)	Income input coefficient
social assistance	22,678 (27)	398,689 (12)	17.580 (3)	10,144 (18)	0.447 (4)
funds, trusts, and financial vehicles	16,593 (34)	36,223 (43)	2.183 (49)	4,090 (31)	0.246 (34)
real estate	288,779 (1)	617,277 (4)	2.137 (54)	13,030 (16)	0.045 (66)
machinery	13,898 (36)	39,386 (39)	2.834 (43)	2,921 (38)	0.210 (41)

Chapter 4. Methodology

The IO modeling framework can be classified into Type 1 and Type 2 models, which differ in their treatment of personal consumption expenditures as either exogenous final demands or as an endogenous economic industry. Both Type 1 and Type 2 models can calculate multiplier effects. However, only the Type 2 model captures induced effects because it treats personal consumption expenditures as an endogenous economic sector. This chapter will introduce the mathematical formulas for calculating multiplier effects and indirect and induced effects, with detailed derivations available in the second and sixth chapters of the classical IO analysis textbook by Miller and Blair (2009). In the next chapter, we will analyze the outcomes of the multiplier effects and induced impacts of the social assistance sector.

4.1 Multiplier effects

The IO model typically employs three multipliers to evaluate the economic significance of interested industries: the output multiplier, the employment multiplier, and the income multiplier. In Formula 1, $m(o)_j$ denotes the output multiplier of industry *j*; l_{ij} denotes the entry at row *i* and column *j* in the total required matrix L; Δf_j represents the final demand change in industry *j*. The output multiplier $m(o)_j$ is calculated by dividing the total output change $\sum_{i=1}^{n} l_{ij} * \Delta f_j$ by the initial change Δf_j. Hence, we obtain the output multiplier of

industry *j* by just summing up the column *j* of the total required matrix *L*. As shown in Formula 1, the output multiplier is not related to the output change.

$$m(o)_j = (\sum_{i=1}^{n} l_{ij} * \Delta f_j)/\Delta f_j = \sum_{i=1}^{n} l_{ij} \qquad \textbf{(1)}$$

However, the employment multiplier needs to consider the output change, because the same magnitude of output change has varying effects on employment across different industries. For example, we first obtain the employment input coefficient e_j by dividing the total employment of industry *j* by its total output. This coefficient tends to be large in labor-intensive industries due to their high total employment, and Google Sheets 3 demonstrates the employment input coefficients for all 67 industries in 2017 New York State. Second, we can obtain a sector-specific employment multiplier matrix *E* by weighting each row entry of *L* with e_i, as shown in Formula 2. Last, the employment multiplier of industry *j* is obtained by dividing the total employment impact $\sum_{i=1}^{n} e_i * l_{ij}$ by the direct employment impact e_j. We can replace the Type 1 total requirement matrix *L* with the Type 2 total requirement matrix $\bar{L}$ to calculate Type 2 employment multipliers. Google Sheets 4 displays both the *L* and $\bar{L}$ matrixes in 2017 New York State. As shown in Formula 2, labor-intensive industries tend to have small employment multipliers because their employment input coefficients are large.

$$m(e)_j = E_j/e_j = (\sum_{i=1}^{n} e_i * l_{ij})/e_j \qquad \textbf{(2)}$$

4.2 Indirect and induced impacts

The IO model is also capable of calculating the indirect and induced impacts resulting from initial output changes in an industry's output. Formula 3 demonstrates how the IO model captures total impacts Δx. The first term Δf signifies the direct impact, meaning an industry needs to produce the same amount of output to meet the final demand change directly. $A\Delta f$, $A^2\Delta f$, and terms with higher powers represent the indirect impacts that arise from ripple effects of the final demand change (Miller, 2017).

$$\Delta x = (I - A)^{-1}\Delta f \cong \left(I + A + A^2 + \ldots + A^k\right)\Delta f = \Delta f + A\Delta f + A^2\Delta f + \ldots + A^k\Delta f \quad \textbf{(3)}$$

However, the Type 1 model does not account for induced impacts, as it treats personal consumption expenditure as exogenous final demands. The Type 2 model captures induced impacts that result from endogenizing personal consumption expenditure as an industry, which engages in selling and purchasing goods or services from other industries. Hence, the Type 2 model calculates the induced impact by subtracting the Type 1 total impact Δx_j from the Type 2 total impact $\Delta\overline{x_j}$. As shown in Formula 4, $\sum_{i=1}^{n+1} \overline{l}_{ij} * \Delta f_j$ denotes the Type 2 economic impact of industry *j*, including direct, indirect and induced impacts. In contrast, $\sum_{i=1}^{n} l_{ij} * \Delta f_j$ denotes the Type 1 economic impact, only including direct and indirect impacts. Thus, the induced impact of industry *j* is just the difference between $\Delta\overline{x_j}$ and Δx_j. The

induced impact assesses the output changes attributable to endogenizing households as an industry within the economy.

$$\Delta\overline{x}_j - \Delta x_j = \sum_{i=1}^{n+1} \bar{l}_{ij} * \Delta f_j - \sum_{i=1}^{n} l_{ij} * \Delta f_j = \left(\sum_{i=1}^{n+1} \bar{l}_{ij} - \sum_{i=1}^{n} l_{ij}\right) * \Delta f_j \quad \textbf{(4)}$$

Indirect and induced impacts measure backward linkages somewhat differently from multipliers. Multiplier analysis normalizes the total impact with the direct impact, assessing the ripple effects caused by a unit change. By comparison, indirect and induced impacts measure ripple effects without dividing by the direct impact. This leads to significant differences because various industries have very different direct employment impacts for the same amount of output change in final demands.

Chapter 5. IO calculation outcomes

This chapter explores the indirect and induced impacts that stem from $1 million new final demands in the social assistance sector in New York State in 2017. The findings illustrate that the social assistance sector has moderate indirect output and employment impacts due to its limited procurement from other industries. However, the social assistance sector exhibits very high induced output and employment impacts. The high induced impacts are attributed to two factors. Firstly, the sector employs a large workforce and designates a significant portion of its budget to labor compensation. Secondly, workers in this sector predominantly spend their income locally.

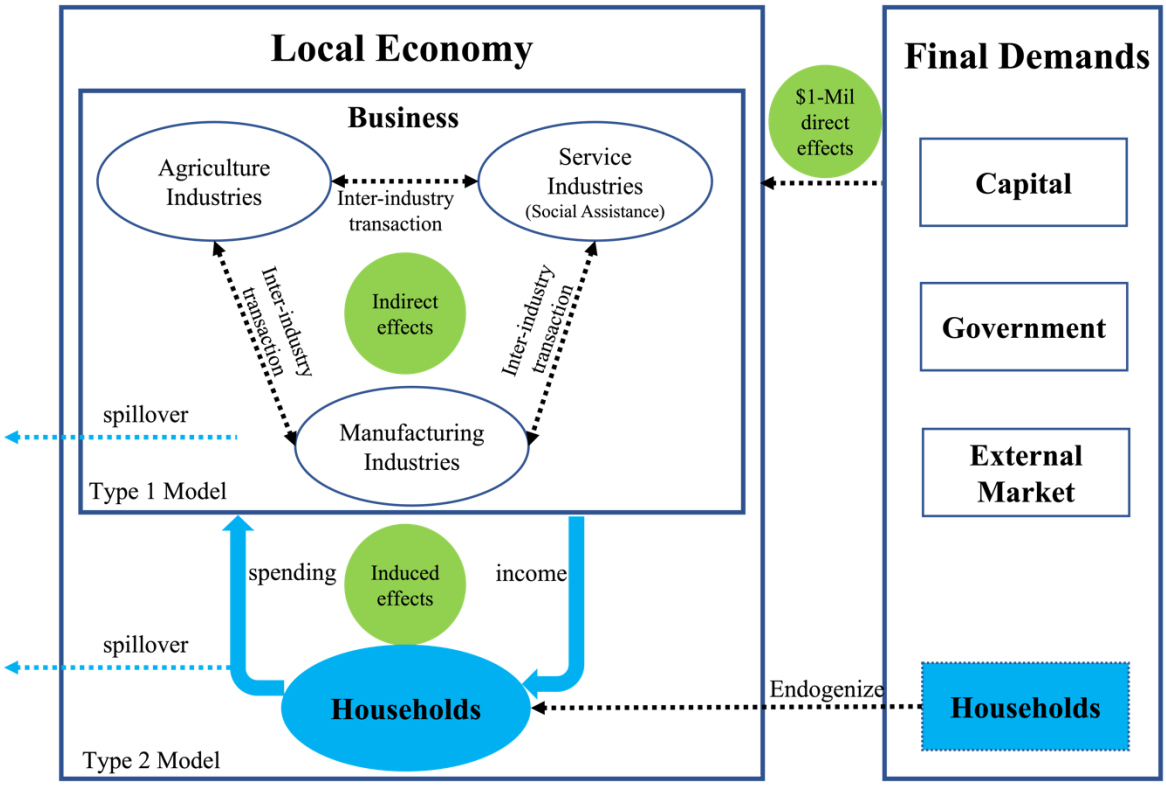
These findings are compared with those of the funds, trusts, and other financial vehicles sector, one of the most profitable service industries; the real estate sector, the industry with the largest total output in 2017 New York state; and the machinery sector, an export-oriented manufacturing industry. This comparative analysis illustrates different contributions these sectors bring to the New York state economy, points out the limitations of the economic base theory, and reveals the biases of the IO multiplier calculation methodology.

5.1 Moderate indirect impacts and high induced impacts

Figure 1 illustrates how the IO model captures the direct, indirect, and induced economic impacts arising from a $1-million increase in final demands for one interested sector. We utilize a $1-million economic shock as it yields results that are comparable with multipliers. The model starts with the fact that an additional $1 million worth of one sector's output are required to meet the extra final demand, thus creating a direct impact within this sector. This

demand, in turn, requires an increase in production from other sectors, generating indirect impacts. Then, induced impacts also arise as households sell more labor to meet augmented production and spend their additional income to buy more goods and services from other sectors.

Figure 1. Analytical framework of the IO model.



This thesis delves into the economic impacts of the social assistance sector. The direct impact refers to the immediate effect of new final demands on the social assistance sector. Subsequently, other sectors must boost their production to accommodate this new demand on the social assistance sector, leading to indirect impacts of the social assistance sector. But the economic impacts do not stop here. Households can be conceptualized as an economic sector that sells labor for income and uses that income to purchase goods from other

industries. This transactional cycle can generate additional effects, referred to as induced impacts of the social assistance sector. This framework is employed to calculate and rank the indirect and induced impacts of all 67 industries in New York State in 2017, as shown in Google Sheets 5.

Table 3 showcases four sectors and ranks their economic impacts among all 67 sectors in 2017 New York state. The total output and employment impacts of the social assistance sector rank 6th and 2nd respectively among all sectors. This thesis splits the total economic impacts into direct, indirect, and induced impacts as shown in Figure 1. The direct output impacts for all 67 sectors are all equally $1 million, but indirect and induced impacts of different sectors vary significantly. For instance, the direct output impacts in the social assistance sector are $1 million, and its indirect output impacts are $0.448 million. This implies that, to satisfy the $1 million increase in output from the social assistance sector, all other industries collectively produce an additional $0.448 million in output. The induced output impacts of the social assistance sector are $0.960 million, indicating that households cause an additional $0.960 million consumption in other industries due to the $1 million output demand on the social assistance sector.

While the direct output impacts are identical for all the 67 sectors, the direct employment impacts vary across these sectors due to their distinct employment input coefficients. For instance, the employment input coefficient of the social assistance sector is 17.580, which is notably high and ranks 3rd among all 67 industries (Table 3). This figure indicates that, for every $1 million increase in demand for its services, this sector generates 17.580 jobs within

itself as the direct employment impact. The indirect employment impact of the social assistance sector equates to 1.644 jobs, which suggests that, to accommodate the increased $1 million final demand, the remaining 66 industries need 1.644 full-time jobs in total to increase their production. The induced employment impacts amount to 4.942 jobs, demonstrating that household consumptions create additional 4.942 jobs due to the $1 million output demand on the social assistance sector.

The social assistance sector has moderate indirect economic impacts but very high induced economic impacts. This discrepancy is due to the sector's limited procurement from other sectors but substantial purchases from households for its labor force. As a result, the social assistance sector contributes significantly to the economy by its high ratio of household consumption expenditure to total output (Table 1) and high labor compensation (Table 2). This can be further elucidated from two perspectives. Firstly, the social assistance sector employs a large number of workers and dedicates a significant portion of its budget to labor income, in line with its high employment and income coefficients indicated in Table 2. Secondly, employees in this sector predominantly spend their earnings locally on goods such as food, clothing, rent, and other necessities, thereby stimulating local businesses.

This thesis selects other three sectors to make a comparison, as shown in Table 3. The sector of funds, trusts, and other financial vehicles stands out with highest indirect and induced impacts among all 67 industries. The machinery manufacturing sector demonstrates moderate indirect and induced impacts, while the real estate sector exhibits low indirect and induced impacts.

Table 3. $1 Million economic impacts of various sectors in the IO model.

	Output (Mil. $)				Employment (person)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
social assistance	1.000	0.448 (37)	0.960 (4)	2.408 (6)	17.580 (3)	1.644 (41)	4.942 (4)	24.166 (2)
funds, trusts, and financial vehicles	1.000	1.248 (1)	1.097 (2)	3.345 (1)	2.183 (49)	3.378 (1)	5.648 (2)	11.208 (27)
real estate	1.000	0.372 (52)	0.232 (65)	1.604 (64)	2.138 (54)	1.427 (56)	1.194 (65)	4.758 (60)
machinery	1.000	0.453 (33)	0.576 (41)	2.028 (38)	2.834 (43)	1.583 (46)	2.964 (41)	7.381 (46)

5.2 Output and employment multipliers

Table 4 illustrates that the social assistance sector's Type 1 output multiplier is 1.448, placing it 37th among all 67 sectors in New York State. The sector's Type 2 output multiplier is considerably higher at 2.408, ranking 6th among all sectors. This high Type 2 multiplier results from the sector's substantial employment needs and high total labor compensation. Meanwhile, workers in this sector primarily spend on local goods and services, including food, drink, rent, clothing, and other daily necessities, thus creating high induced impacts. Comparing Type 1 and Type 2 output multipliers in Table 4, the social assistance sector contributes more to the economy than the real estate sector, the largest industry in New York State, and the machinery sector, an export-oriented manufacturing sector. Thus, the output multiplier underscores the social assistance sector's significant economic contributions.

However, multipliers and economic impacts provide different information. Table 3 exhibits that $1 million output demands on the social assistance sector can generate 17.580 jobs as its direct employment impact. The direct employment impact of the social assistance sector

ranks 3rd among 67 industries in 2017 New York State. This number is in line with its high employment input coefficient, implying this sector requires a large number of jobs to produce each million dollars of output. As the employment multiplier is derived by dividing total employment impacts by direct employment impacts, the labor-intensive industries tend to have low employment multipliers in both Type 1 and Type 2 models. Table 4 shows that the social assistance sector has very low Type 1 and Type 2 employment multipliers, 1.093 and 1.375 respectively, ranking 65th and 64th.

Table 4. Output and employment multipliers

	Employment input coefficient	output multiplier		employment multiplier	
		Type 1	Type 2	Type 1	Type 2
social assistance	17.580 (3)	1.448 (37)	2.408 (6)	1.093 (65)	1.375 (64)
funds, trusts, and other financial vehicles	2.183 (49)	2.248 (1)	3.344 (1)	2.547 (4)	5.134 (4)
real estate	2.137 (54)	1.372 (52)	1.604 (64)	1.668 (21)	2.226 (31)
machinery	2.834 (43)	1.453 (33)	2.028 (38)	1.559 (25)	2.605 (25)

The funds, trusts, and other financial vehicles sector has moderate direct employment impact and high total employment impact. Thus, the employment multiplier of this sector is very high. For example, its Type 1 employment multiplier is 2.547, indicating 1 new job in this sector can generate 2.547 jobs in the whole economy. This number ranks 4th among all 67 industries. Similarly, the Type 1 employment multiplier of the real estate sector is 1.668, indicating 1 job increase in this sector can create 1.668 jobs in the entire economy. The Type 1 employment multiplier of the machinery sector is 1.559, indicating 1 job increase in this

sector can generate 1.559 jobs in the entire economy. The corresponding multipliers for all 67 industries in New York State in 2017 can be found in Google Sheets 6.

Employment multipliers and total employment impacts offer related but distinct information for economic contributions. Employment multipliers indicate the number of jobs generated in other sectors for each job increase in the sector of interest; however, they do not account for the amount of investment needed to create each job in the targeted sector. For instance, the Type 2 employment multiplier for the sector of funds, trusts, and other financial vehicles is 5.134, much higher than 1.375 of the social assistance sector. However, $1 million investment in the funds, trusts, and other financial vehicles sector create 11.208 jobs in the Type 2 model. In contrast, $1 million investment in the social assistance sector creates 24.166 jobs in the Type 2 model. The same amount of investment in the social assistance sector can create more jobs.

Chapter 6. Discussion

6.1 Biases of the economic base theory and multipliers

The economic base theory emphasizes external demands while overlooking local demands, positing that the demands from external markets determine an economy's growth. Therefore, export-oriented industries are regarded as the driving force of economic growth. Developing economies that heavily rely on external markets might fit well with the economic base theory. However, the economic base theory does not hold true for developed economies. New York state as a well-developed economy has large household consumptions. Thus, its local demands play a vital role in economic growth. Sectors providing local public services function as essential social infrastructure to promote economic development.

Multipliers are utilized as key indicators to measure the economic contributions of various sectors (Richardson, 1985; Mulligan, Jackson, & Krugh, 2013). However, this measurement can introduce biases. Multipliers assess the capacity of different industries to generate ripple economic effects, with high-profit and export-oriented industries being particularly effective at creating trickle-down effects. These high-profit and export-oriented industries bring external resources into an economy and create high-income jobs, thereby contributing to tax revenues. Consequently, governments tend to emphasize the economic contributions of these high-profit and export-oriented industries, often neglecting the economic contributions of low-skilled and local service industries. Multipliers, serving as straightforward indicators, conveniently align with this tax-based economic development strategy. However, a critical question arises: how much low-income people can benefit from this tax-based economic

development? This question underscores the need for a more comprehensive and equitable approach to measuring economic contributions of low-skill and local service sectors.

6.2 Limitations of the IO model

Local service industries function as essential social infrastructures, providing crucial public services, enabling other economic activities, and fostering human development (Folbre, 2006; Warner, 2006). However, the IO model only measures tradable goods and services flowing within the economy, which does not consider the enabling values and human development values. This thesis reveals that, even when not considering labor mobilization and human development values, the social assistance sector still holds significant economic worth purely based on its regional economic value. So, why does the government often undervalue these local service industries?

One reason is that these industries have low indirect impacts, indicating limited purchases from other sectors. Thus, economists tend to undervalue its potential of promoting economic growth. The other reason lies in the fact that these industries generally offer lower salaries and need more low-skilled workers, which limits the government's ability to generate substantial tax revenues and requires more local public services. Consequently, despite the advantages that investments in these local service industries could offer to low-income and low-skilled workers, policy-makers frequently underestimate the economic contributions of local service sectors.

The IO model cannot capture social values. Thus, a more holistic approach to measuring the economic importance of local service industries would encompass regional economy, labor

mobilization, and human development. Governments are urged to recognize the economic contributions of local service industries and to consider the potential benefits that could be accrued by disadvantaged individuals and underserved communities.

6.3 A new financial mechanism to invest the social assistance sector

This research underscores the economic contributions of the social assistance sector. Given this sector's lack of an external market, financial support for local service industries typically originates from public funding and government revenues. As a result, expenditures on social assistance services are often perceived as financial burdens or social welfare costs. Governments are introducing innovative financial mechanisms to mitigate fiscal strain and fund social programs. One such mechanism, known as Social Impact Bonds (SIBs), is designed to attract private sector investment into preventive social programs where public investment might be lacking.

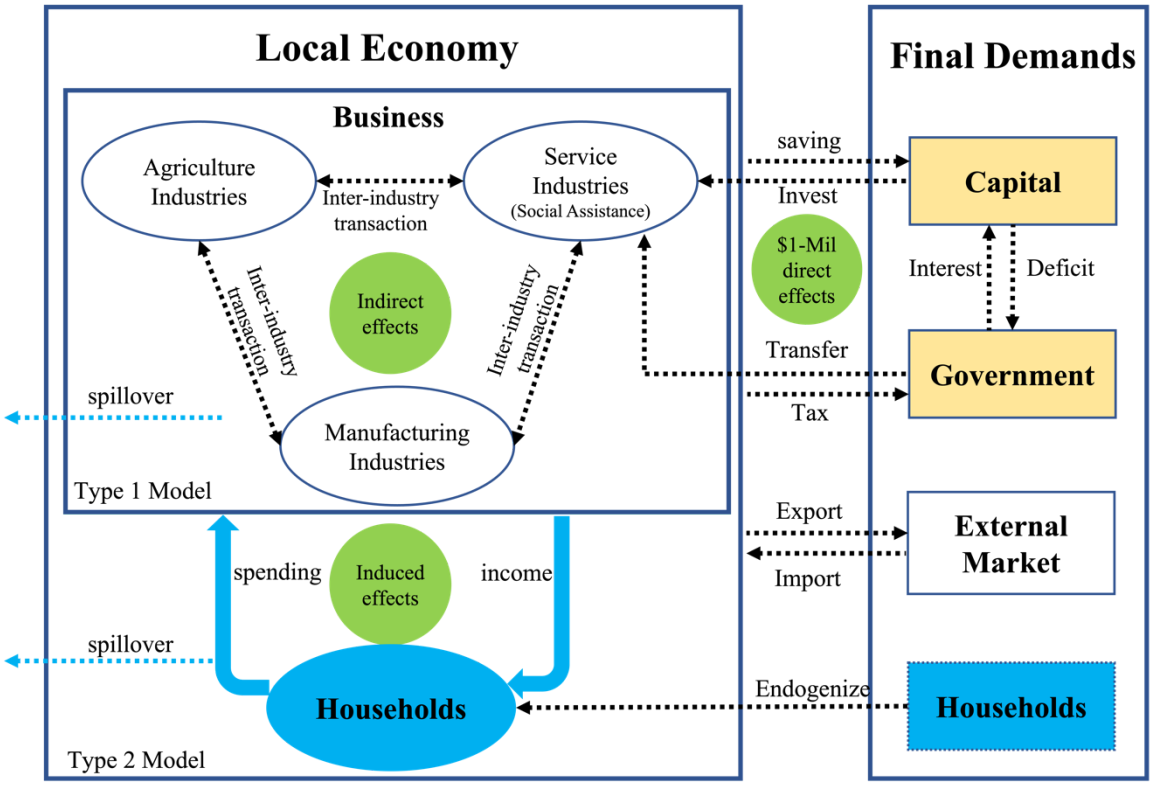
Figure 2 outlines the SIBs framework and delineates the financial relationship between the private capital and the government within the IO model. In the SIBs framework, governments contract with private investors to provide social assistance services, agreeing to reimburse private capital with certain interest if the specific outcomes stipulated in their agreements are met. Hence, SIBs are often described as 'pay for outcomes' (Williams, 2020). Advocates contend that this mechanism presents an innovative way to leverage private investment for public services, augmenting the resources available for local service sectors (Fraser, Tan, Lagarde, & Mays, 2018).

However, as private investors are inherently profit-driven, they may cream skim the population and favor projects with high returns and low risks. This inclination contradicts the objectives of social programs, which should fund most needed projects and support the most disadvantaged individuals. Moreover, given that the recipients of SIBs are often disadvantaged individuals with weak influence over public decision-making, strong regulations are required to safeguard social service provision (Warner, 2013). Furthermore, SIBs may risk narrowing their focus to quantifiable aspects of an intervention, potentially neglecting broader goals of social inclusion and human development. Therefore, coordination among different agencies is necessary (Tse & Warner, 2020). Last but not the least, the transaction costs of SIBs can be very high, and the government is responsible for paying high rate returns on these private investments. All the money ultimately comes from public revenues, as shown in Figure 2. Therefore, while SIBs might appear to alleviate fiscal pressure in the short term, they could simply be deferring the financial burden and deepening future public debt.

Tse and Warner (2020) examined three U.S. Social Impact Bond (SIB) programs and posited that SIBs can serve as piloting social programs for systemic change. If successful, the government can then expand and scale these social programs. In addition, comprehensive and stringent metrics are key factors for successful SIBs, thus can generate concrete data on the results of investing in social assistance services. This can offer compelling evidence to policymakers on the value of investments in social programs. While the (IO) model fails to measure labor mobilization and human development values of social programs, SIBs success metrics may contribute vital information about these non-tradable and non-monetized

values. This can help shift the perception of social program funding from being seen as mere financial obligations to being recognized as strategic development investments.

Figure 2. IO framework for SIBs investment in the social assistance sector



Chapter 7. Conclusion

Utilizing 2017 IO data and BEA employment and income data, this thesis quantifies the economic contributions of the social assistance sector in terms of the direct, indirect, and induced impacts triggered by $1 million economic shock. Findings suggest that the social assistance sector plays an important role in promoting economic development. According to IO calculations of $1 million economic shock on various sectors, conclusions are:

1) While the direct output impacts are all equally $1 million for all 67 sectors, the direct employment impacts of different sectors vary significantly. The social assistance sector, requiring a substantial workforce for every million dollars of output, exhibits high direct employment impacts. Its high direct employment impacts are especially beneficial for low-income and low-skill workers.

2) The social assistance sector has moderate indirect output and employment impacts due to its limited purchases from other industries. Consequently, these modest indirect impacts become one of the reasons that lead to the underestimation of its economic contributions.

3) The social assistance sector manifests very high induced impacts when we endogenize households as an economic sector that sells labor in exchange for income and uses that income to purchase goods and services. These high induced impacts are attributable to the sector's significant labor compensation and its workforce's predominant local spending.

The findings drawn from IO calculation contest the economic base theory, which prioritizes exporting industries while underestimating the economic importance of local service industries. While exporting industries undeniably attract external funds and stimulate the local economy, the extent to which low-income individuals benefit from this development model warrants further investigation. The social assistance sector offers considerable value in terms of labor mobilization and human development. These aspects empower low-income individuals by engaging them into economic activities and fostering their long-term success, rather than deepening their dependency on the social welfare system. Despite these values being overlooked by the IO model, the social assistance sector still displays considerable economic contributions to the economy of New York State.

Economists and policymakers undervalue the economic contributions of the social assistance sector due to its limited inter-sectoral transactions and low tax revenues. However, this sector significantly stimulates local spending and benefits local businesses. Furthermore, it provides labor mobilization and human development values, which are extremely beneficial to disadvantaged individuals. Traditional economic models, however, fail to measure these crucial aspects. As such, we advocate for a paradigm shift in the economic discourse, reframing the funding of social assistance services from being perceived as mere social welfare expenditure to being recognized as strategic investments for local economic development.

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