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**The Wage and Productivity Impacts of New Jobs on the
Hillsborough County Economy**
Job-creation Initiatives in 1997

An Analysis Performed by

CENTER FOR ECONOMIC DEVELOPMENT RESEARCH
College of Business Administration



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Preface

This study, *The Wage Impact of New Jobs on the Hillsborough County Economy, Job-creation Initiatives in 1997*, was prepared by the Center for Economic Development Research (CEDR), College of Business Administration, University of South Florida. CEDR provides information and conducts research on issues related to economic growth and development in the Nation, in the state of Florida, and particularly in the central Florida region. The Center serves the faculty, staff, and students of the College of Business Administration, the University, and individuals and organizations in the University's service area. CEDR's activities are designed to further the objectives of the University and specifically the objectives of the College of Business Administration.

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EXECUTIVE SUMMARY

This is a report of the findings of analysis of economic development related job-creation initiatives in Hillsborough County, Florida during 1997. That year there were five job-creation initiatives implemented in Hillsborough County. The Employers Impact Fee Mitigation Program (EIFMP), approved by the Board of County Commissioners in 1996, governed two initiatives and the provisions of Florida's Qualified Target Industry (QTI) Tax Refund Program guided three initiatives.

Based on Covered Employment and Wages (ES-202) data, the weighted-average wage for workers in Hillsborough County in 1997 was \$27,536. Additionally, using a regional economic model, we estimate countywide output per worker at \$79,989 for 1997.

The findings are:

EIFMP Initiatives.

- Both initiatives reported an average direct wage of \$24,454 per annum, which was the minimum requirement for the program in 1997.
- The initiatives created 75 direct jobs and generated 90 more indirect and induced jobs.
- The average wage for the total of 165 jobs was \$25,822.
- The average effect of the 165 jobs is typically 164% of countywide output per worker.
- The initiatives tend to decrease average wages, while typically raising output per worker overall.

QTI Program Initiatives.

- The three initiatives reported an average direct wage ranging from \$27,717 to \$68,700.
- The initiatives created 1,835 direct jobs and generated 1,385 more indirect and induced jobs.
- The average wage for the total of 3,220 jobs was \$31,641.
- The average effect of the 3,220 jobs is typically 141% of countywide output per worker. However, only one of the three initiatives would be expected to increase overall output per worker.
- Combined, the three initiatives tend to increase average wages and output per worker. Individually, two tend to boost average wages, but decrease overall worker productivity and the other tends to lower average wages, but increase overall worker productivity.

Based on the trend line, QTI initiatives in 1997 would need to create direct jobs paying at least 108% of the countywide weighted-average wage in order that the average wage for all jobs would at least be as much as the countywide average before the initiative was

undertaken. Two of the three initiatives implemented in 1997 had average direct wages above the 108% threshold.

The findings illustrate the difficulty of objectively evaluating a job-creation program. The evaluation clearly depends on the intended purpose of the program. A goal such as to “improve the economic situation” is too vague. Therefore, it is recommended that the implementing authority for any job-creation initiative include a specific and measurable criterion or criteria upon which the efficacy of the program may be evaluated.

The Wage and Productivity Impacts of New Jobs on the Hillsborough County Economy

Job-creation Initiatives in 1997

Introduction.

The purpose of this paper is to report findings of analysis of economic development related job-creation initiatives in Hillsborough County, Florida.

Hillsborough County is located in west central Florida and is one of seven counties often referred to as Tampa Bay. The Hillsborough County Economic Development Department administers programs that sustain and encourage the economic growth of the local economy, including programs that stimulate the creation of quality jobs for the skilled and semi-skilled work force. The Department's Corporate Business Development (CBD) section is committed to increasing quality job opportunities for the community's residents by helping to establish, maintain and project Hillsborough County's business friendly climate to corporations that create and sustain those desirable quality jobs.¹

This study is commissioned by the CBD section of the Hillsborough County Economic Development Department. It encompasses five job-creation economic development initiatives in Hillsborough County during the year 1997. The input data for analysis were provided by the CBD and are shown in **Table 1** (next page). It is anticipated that we will expand the analysis in the future to include job-creation activity in subsequent years.

The Qualified Target Industry (QTI) Tax Refund Program is available to Florida communities to encourage the expansion of existing businesses or the location of new-to-Florida businesses. The program provides tax refunds to pre-approved applicants of \$3,000 per new job created (\$6,000 in an Enterprise Zone or rural county). A company that pays an average of at least 150 percent of area wages receives an additional \$1,000 per job. And a company that pays an average of at least 200 percent of area wages receives an additional \$2,000 per job. The QTI program is authorized by s. 288.106 *F.S.*

The Employers Impact Fee Mitigation Program (EIFMP) was approved by the Board of County Commissioners on February 14, 1996 "to encourage employers to add higher paying, quality jobs to the employment base of Hillsborough County."² The program pays \$1,000 per job created toward development impact fees assessed in unincorporated Hillsborough County. An employer must maintain the new jobs for at least four years. To qualify a job must be full-time, non-seasonal and pay 100% of the local annual average wage or better, excluding benefits. The annual average wage is

¹ Source is www.hillsboroughcounty.org/home.html on 9/24/01.

² Reference "A Revised and Simplified Proposal to Mitigate Impact Fees for Employers Who Create New Quality Jobs in Hillsborough County Including a Distressed Area Option," Hillsborough County Commerce department, Office of Financial Services, revised 2/1/96.

defined by Covered Employment and Wages (ES-202) data reported for Hillsborough County by the Florida Department of Labor.

Table 1

Input Data

<u>Company Name</u>	<u>Type of Business</u>	<u>SIC Code</u>	<u>Conditions</u>	<u># of Jobs</u>	<u>Avg. Wage of Jobs</u>
Esco Manufacturing, Inc.	Electronic Repair	7629	EIFMP*	25	\$24,454
Telephone Services, Inc.	Assembly of Phone Cables & Accessories	36	EIFMP*	50	\$24,454
Chase Manhattan Bank	Finance/Mortgage	6141/6162	QTI*	1330	\$32,350
Smithfield (Lykes)	Meat packaging, processing, & distribution	2013	QTI*	275	\$27,717
PriceWaterhouse	Accounting Services	8721	QTI*	230	\$68,700

CONDITION

***EIFMP**

- Jobs must be new to Hillsborough County.
- Jobs must be created within unincorporated Hillsborough County.
- Wages of the new jobs must be \$24,454 per year or higher.
- Requires the creation of at least 25 new jobs in order to qualify.
- New jobs must be maintained for at least 4 years.
- Company agrees to provide evidence of the jobs and their wages.
- Company agrees to provide the County with a secure financial instrument.

***QTI**

- Application for program eligibility must be made before the company decides to locate or expand in Florida.
- Jobs must have wage of at least 115% of the State, County, or Metropolitan average wage.
- Must create a minimum of 100 new jobs or a 10% increase in employment if expanding in Florida.
- Must be maintained for a minimum of 4 years.

The foundation of this analysis is the understanding that job creation in one industry begets additional jobs in related industries. In addition, further jobs are created to support an increased level of aggregate household income and spending resulting from the inter-industry job creation. In this analysis, the job creation process, as it ripples through an economy, is estimated using the *IMPLAN Professional*TM regional economic impact model.

Economic Foundation of the Analysis.

When jobs are created in an industry, these jobs motivate the creation of additional jobs in related industries. The Frenchman Francois Quesnay, founder of the physiocratic or “natural order” philosophy of economic thought, first described inter-industry relationships in 1758. The physiocrats depicted the flow of goods and money in a nation, and thus made the first attempt to describe the circular flow of wealth on a macroeconomic basis. Wassily Leontief was born in Russia in 1906 and first studied economic geography at the University of St. Petersburg before moving to Berlin and China. He came to the United States in 1931 and, after a brief 3-month stint at the National Bureau of Economic Research in New York, Harvard University hired him. At Harvard, Professor Leontief undertook a research project that encompassed a 42-industry input-output table showing how changes in one sector of the economy lead to changes in other sectors. From this research, he developed the concept of multipliers from input-output tables, and was subsequently awarded the Nobel prize in economics in 1973 for his development of input-output (I-O) economics.

For example, an increase in purchases (first round) of output from a manufacturing industry in a region may require that the manufacturing industry, in order to expand output, purchase (second round) factor inputs from other industries of the regional economy. In turn, these other industries may have to purchase (third round) inputs to deliver the supporting production of factors to the manufacturing industry. The rounds of spending will continue with each round becoming increasingly weaker in its impact because of leakage from the region attributable to imports, savings, and taxes.

The first round is called the *direct effect* of the change in demand in an industry of the economy. The second and subsequent rounds are collectively referred to as the *indirect effects* of inter-industry purchases in response to direct effect. Changes in spending by households as income increases due to changes in the level of production, i.e. the direct and indirect effects, are called *induced effects*. The *total effect* is the sum of the direct, indirect and induced effects.

Motivation of the Analysis.

The purpose of job-creation programs, like the QTI and EIFMP, is often stated as the improvement of the economic situation of the residents of the region. More specifically, the conditions of a program may require that the new jobs pay an average annual wage that is greater than the current average wage in the region. In 1997, the EIFMP required a wage of \$24,454 or higher and the QTI program required a wage of at least 115% of the statewide, county, or metropolitan area average wage. These wage-rate conditions only applied to the direct jobs. Thus, program conditions do not consider the indirect and induced effects of jobs created by the program.

Failure to consider indirect and induced jobs could make an initiative seem to improve a region’s economic situation, while the true consequence is a lowering of average wages. A project can lower average wages if the indirect and induced jobs pay

below the average wage, and offset the gains made by direct jobs at above average wages. This analysis examines whether the *total effect* of Hillsborough County's 1997 job-creation initiatives increases or decreases average wages for people working in the county.

While an increasing average annual wage in a region may be interpreted as an improvement in the economic situation of the region's residents, increasing productivity is the key to raising living standards and regional competitiveness. That is so, because if workers produce more in a specified time period, firms can sell more, boost profits, and raise incomes at the same time without necessarily raising prices. Thus, this analysis also examines the impact of Hillsborough County's job-creation initiatives on annual countywide worker productivity. In order to discern the *total impact* of an initiative on countywide worker productivity, the indirect and induced jobs are considered as well as the direct jobs.

Output can be thought of as sales.³ Output can also be expressed as the sum of the cost of the intermediate goods, which go into the production process, and the value added to those goods during production. When the product is sold, part of its price covers the cost of the intermediate goods. The residual after paying for the intermediate goods is divided between a return to the owners of capital and the wages of labor. A job-creation initiative that raises average wages, but is expected to lower average output per worker, may reduce the standard of living and regional competitiveness. Hence, a preferred job-creation initiative is one that raises both average wages and average productivity.

The QTI Program and the EIFMP mandate conditions for award of a tax refund. These conditions are outlined in Table 1. The link between the conditions for award of a tax refund and the expected improvement in a region's economy must be established by implication. This is because neither program specifies the expected economic improvement in measurable terms. We select average wages and productivity as measurements for this economic analysis. However, our selection does not imply that these are the only possible measures of expected economic improvement, and consequently the sole measures of the efficacy of either program.

Method of Analysis.

We calculated a weighted-average annual wage for Hillsborough County during 1997. To make this calculation, we determined the distribution of employment across the divisions of Hillsborough County's economy.⁴ This distribution is determined from Covered Employment and Wages (ES-202) data for 1997. The ES-202 data are based on information provided to the State of Florida with unemployment insurance premiums

³ Sales equal output + or - an inventory adjustment. Goods that are produced, but not sold, during the period are placed into inventory. Conversely, goods produced in a prior period may be sold out of inventory during the current period.

⁴ Divisions of the economy are defined at the one-digit Standard Industrial Classification (SIC) level. The SIC is a system developed by the US government to classify industries.

paid by employers. Next, again using ES-202 data, we calculated the 1997 average wage in each division of the economy. Then, using the percentages of employment distribution and the average annual divisional wages, we find a weighted-average annual wage in Hillsborough County during 1997. The weighted-average annual wage is the sum of each divisional average wage multiplied by the percent of total jobs in the division. **See Table 2.** The county’s weighted- average annual wage in 1997 was \$27,536.

Table 2

1997 Hillsborough County Weighted Average Wage

Division Name	Jobs	% of Total Jobs	Avg Annual Wage	Avg Annual Wage as a % of Weighted Avg Annual Wage
0 Agriculture	10,794	2.04%	\$14,017	50.90%
1 Mining	22	0.00%	\$35,699	129.64%
1 Construction	25,792	4.87%	\$30,247	109.84%
2 & 3 Manufacturing	36,364	6.87%	\$30,002	108.96%
4 Trans&PubUtil	33,648	6.36%	\$38,327	139.19%
5 Trade	125,096	23.63%	\$22,836	82.93%
6 FIRE	42,276	7.99%	\$37,190	135.06%
7 & 8 Services	230,538	43.55%	\$26,324	95.60%
9 PubAdmin	24,856	4.70%	\$30,850	112.03%
Total	529,386	100.00%		
		Weighted Avg Annual Wage =	\$27,536	

Source: State of Florida Covered Employment and Wages (ES202) annual data for 1997

The direct effect of a job creation initiative is an increase in jobs in a specified industry. We use the IMPLAN model to estimate the indirect and induced effects of the newly created jobs on Hillsborough County. For each initiative, we examine how the new jobs are distributed across the divisions of the county’s economy. Then, based on this distribution, we calculate an average wage for the indirect jobs and an average wage for the induced jobs. The total wage effect of an initiative is summarized as the weighted-average of wages for the direct, indirect and induced jobs.

We organize the findings into tables that facilitate comparison of the indirect, induced and total effects with the county’s weighted-average wage in the year an initiative is approved. We realize that this may be construed as being a “Monday morning quarterback.” Officials responsible for approval / disapproval of these job-creation initiatives would not yet know the average wage for the year in which they are making a decision. However, our intent is to produce reliable estimates of the actual effect on the average wage for approved initiatives. It is not intended to criticize decision-makers, who must call the plays during the game, not on Monday morning.

We form predictive models for the QTI program. The predictive models are trend lines for the percentages of indirect, induced, and total average wages as a percentage of the 1997 countywide weighted-average wage. The trend lines report percentages of average indirect, induced, and total wages with respect to an initiative’s average direct wages.

We also estimate workers' productivity in Hillsborough County. Productivity is calculated as annual output per worker. Output includes all intermediate goods purchased (inputs for the production process) plus the value added to the inputs. Employing a regional economic model, we estimate countywide output per worker at \$79,989 for 1997.⁵

Using the IMPLAN model, we estimate the productivity per worker for the direct, indirect and induced jobs of each initiative. IMPLAN model productivity measurements are based on an industry's productivity before the creation of the new jobs, which are being studied. Therefore, the productivity measurements do not necessarily reflect the productivity of workers in the new jobs, but are typical of the productivity of that industry in Hillsborough County.

The (typical) productivity estimates of the newly created jobs are compared to Hillsborough County's overall annual output of \$79,989 per worker.

Findings.

During 1997 there were two initiatives under the EIFMP: 1) Esco Manufacturing, Inc., an electronic repair service business, and 2) Telephone Services, Inc, a firm that manufactures electronic equipment.

Table 3 (next page) reports the effects of the 25 jobs created at Esco Manufacturing with an average wage of \$24,454.⁶ (All dollar amounts in these findings are 1997 dollars.) We estimate that these 25 direct jobs spur 5.9 full-time equivalent jobs at related industries within Hillsborough County. The 5.9 indirect jobs pay an average wage of \$27,646, which is slightly above the countywide average. Additionally, an increase in household consumption spending induces more jobs estimated to be 10.3 full-time equivalent jobs with an average wage of \$26,535. The induced jobs have an average wage that is slightly below the countywide average.

⁵ To estimate output per worker, we used the REMI Policy Insight™ model. REMI includes a county baseline that reports the actual levels of economic variables before a simulation is introduced into the model.

⁶ The CBD section of the Hillsborough County Economic Development Department reported to CEDR that the Esco Manufacturing initiative and the Telephone Services initiative were both approved in January 1997. The \$24,454 average annual wage required for these initiatives was based on 1995 data, which was the most current available at the time of approval.

Table 3

1997
 ESCO MANUFACTURING, INC.
 ELECTRONIC REPAIR SIC 7629 = IMPLAN SECTOR 480
 INCENTIVE TYPE: EIFMP
 25 DIRECT JOBS
 AVG. DIRECT WAGE **\$24,454**

Indirect Employment Effects

Division Name	Jobs	% of Emp. Impact	Divisional Wage as % of County		Div. Avg. Wage times
			Weighted Avg. Wage	Divisional Avg. Wage	
0 Agriculture	0.0	0.00%	50.90%	\$14,017	\$0
1 Mining	0.0	0.00%	129.64%	\$35,699	\$0
1 Construction	0.2	3.39%	109.85%	\$30,247	\$1,025
2 & 3 Manufacturing	0.6	10.17%	108.96%	\$30,002	\$3,051
4 Trans&Pub Util	0.3	5.08%	139.19%	\$38,327	\$1,949
5 Trade	1.4	23.73%	82.93%	\$22,836	\$5,419
6 FIRE	0.5	8.47%	135.06%	\$37,190	\$3,152
7 & 8 Services	2.7	45.76%	95.27%	\$26,234	\$12,005
9 Public Admin	0.2	3.39%	112.04%	\$30,850	\$1,046
Total	5.9	100.00%			\$27,647
County Wt. Avg. =				\$27,536	

Induced Employment Effects

Division Name	Jobs	% of Emp. Impact	Divisional Wage as % of County		Div. Avg. Wage times
			Weighted Avg. Wage	Divisional Avg. Wage	
0 Agriculture	0.1	0.97%	50.90%	\$14,017	\$136
1 Mining	0.0	0.00%	129.64%	\$35,699	\$0
1 Construction	0.2	1.94%	109.85%	\$30,247	\$587
2 & 3 Manufacturing	0.2	1.94%	108.96%	\$30,002	\$583
4 Trans&Pub Util	0.3	2.91%	139.19%	\$38,327	\$1,116
5 Trade	3.7	35.92%	82.93%	\$22,836	\$8,203
6 FIRE	0.9	8.74%	135.06%	\$37,190	\$3,250
7 & 8 Services	4.5	43.69%	95.27%	\$26,234	\$11,461
9 Public Admin	0.4	3.88%	112.04%	\$30,850	\$1,198
Total	10.3	100.00%			\$26,535
County Wt. Avg. =				\$27,536	

Total Effect for this Initiative

Effect	Jobs	Average Wage	Contribution to Total Effect
Direct	25.0	\$24,454	\$14,839
Indirect	5.9	\$27,647	\$3,959
Induced	10.3	\$26,535	\$6,634
Total	41.2	Initiative Wt. Avg. =	\$25,431

A majority of the indirect and induced jobs are created in relatively low-wage divisions of the Hillsborough County economy. (The distribution of jobs is shown in the column labeled “% of Emp. Impact” and the wage level relative to the county’s weighted-average wage is shown in the column labeled “Divisional Wage as % of County Weighted average Wage.”) However, because the number of indirect and induced jobs was small, the fractional job equivalents in relatively high-wage divisions offset the low-wage jobs. Thus, the indirect and induced jobs paid, on average, wages approximately equal to the countywide average wage for 1997.

However, the average wage for the direct jobs was below the 1997 countywide average wage of \$27,536. Thus, the total effect of the Esco Manufacturing initiative is 41.2 full-time equivalent jobs in Hillsborough County at an average wage of \$25,431. Hence, this estimate of the wage impact of the new jobs indicates that the Esco Manufacturing initiative would tend to decrease average wages for people who work in Hillsborough County.

Table 3.1 (next page) reports the estimated increases in output caused by the 25 jobs created at Esco Manufacturing. Twenty-five jobs in the “electronic repair” industry typically add \$1.93 million per year to Hillsborough County’s private-sector output. That equates to \$77,228 per worker – nearly 98% of the countywide output per worker. A small number of indirect jobs produce additional output at more than 120% of the average output per worker, while the induced jobs produce at about 89% of average output. The total impact on productivity of this initiative is over \$3.2 million of increased output. This increased output comes at a rate that is 98.81% of the countywide output per worker; hence, the project minimally influences a change output per worker in the county.

Table 3.1 also shows the value-added per worker portion of output per worker. Typically, a worker in the “electronic repair” industry adds \$33,872 to the value of the firm’s products during a year. The typical value-added in the industry is consistent with the average direct wage of \$24,454 (excludes benefits, if any) paid by Esco Manufacturing for the 25 newly created jobs.

Because the typical output and value-added data may not fully reflect the impact on the Hillsborough County economy in 1997, we also examine output and value-added data for the “electronic repair” industry during 1998.⁷ The data indicate that productivity in this industry slightly declined in 1998 from the 1997 level. Output per worker fell to \$69,479 in 1998 from \$77,228 (-10.0%) in 1997; value-added per worker fell to \$32,069 in 1998 from \$33,872 (-5.4%) in 1997.

We find that the Esco Manufacturing initiative would tend to decrease the average wage and have a minimal impact on overall productivity in Hillsborough County.

⁷ Although this initiative was approved in 1997, we do not precisely know when the new jobs came on line. However, it seems unlikely that the new positions were filled throughout all of 1997. Therefore, the 1997 economic data may not fully reflect the impact of these jobs on productivity during that year.

Table 3.1

1997
 ESCO MANUFACTURING, INC.
 ELECTRONIC REPAIR SIC 7629
 = IMPLAN SECTOR 480
 INCENTIVE TYPE: EIFMP
 Overall County Output per Worker = \$79,989

Productivity Comparisons

Effect	Jobs	Output	Output per Worker	% of County Output per Worker	Value-added per Worker
Direct	25.0	\$1,930,690	\$77,228	97.77%	\$33,872
Indirect	5.9	\$561,868	\$95,232	120.56%	\$58,274
Induced	10.3	\$723,134	\$70,207	88.88%	\$45,380
Total	41.2	\$3,215,692	\$78,051	98.81%	\$40,243

Table 4 (next page) reports the effects of the 50 jobs created at Telephone Services with an average wage of \$24,454. We estimate that these 50 direct jobs generate 35.5 full-time equivalent jobs at related industries within Hillsborough County. The 35.5 indirect jobs pay an average wage of \$27,482, which is almost equal to the countywide average. Additionally, an increase in household consumption spending induces more jobs estimated to be 38.4 full-time equivalent jobs with an average wage of \$26,489. The induced jobs have an average wage that is slightly below the countywide average.

Like the Esco Manufacturing initiative, a majority of the indirect and induced jobs are created in relatively low-wage divisions of the Hillsborough County economy. However, just over 22% of the indirect jobs are in the high-wage manufacturing division. These manufacturing jobs, along with a few jobs in other high-wage divisions, bring the average wage for indirect jobs about equal with the countywide average.

However, the average wage for the direct and the average wage for the induced jobs were both below the 1997 countywide average of \$27,536. Thus, the total effect of the Telephone Services initiative is 123.9 full-time equivalent jobs in Hillsborough County at an average wage of \$25,952. Hence, this estimate of the wage impact of the new jobs indicates that the Telephone Services initiative would tend to decrease average wages for people working in Hillsborough County.

Table 4

1997
 TELEPHONE SERVICES, INC.
 ASSEMBLY OF PHONE CABLES AND ACCESSORIES SIC 36xx = IMPLAN SECTOR 372
 INCENTIVE TYPE: EIFMP
 50 DIRECT JOBS
 AVG. DIRECT WAGE **\$24,454**

Indirect Employment Effects

Division Name	Jobs	% of Emp. Impact	Divisional Wage		Div. Avg. Wage	
			as % of County	Divisional	times	% of Emp. Impact
			Weighted Avg. Wage	Avg. Wage		
0 Agriculture	0.1	0.28%	50.90%	\$14,017		\$39
1 Mining	0.0	0.00%	129.64%	\$35,699		\$0
1 Construction	1.6	4.51%	109.85%	\$30,247		\$1,363
2 & 3 Manufacturing	7.9	22.25%	108.96%	\$30,002		\$6,677
4 Trans&Pub Util	1.5	4.23%	139.19%	\$38,327		\$1,619
5 Trade	8.8	24.79%	82.93%	\$22,836		\$5,661
6 FIRE	1.8	5.07%	135.06%	\$37,190		\$1,886
7 & 8 Services	13.5	38.03%	95.27%	\$26,234		\$9,976
9 Public Admin	0.3	0.85%	112.04%	\$30,850		\$261
Total	35.5	100.00%				\$27,482
County Wt. Avg. =				\$27,536		

Induced Employment Effects

Division Name	Jobs	% of Emp. Impact	Divisional Wage		Div. Avg. Wage	
			as % of County	Divisional	times	% of Emp. Impact
			Weighted Avg. Wage	Avg. Wage		
0 Agriculture	0.4	1.04%	50.90%	\$14,017		\$146
1 Mining	0.0	0.00%	129.64%	\$35,699		\$0
1 Construction	0.8	2.08%	109.84%	\$30,247		\$630
2 & 3 Manufacturing	0.6	1.56%	108.96%	\$30,002		\$469
4 Trans&Pub Util	1.3	3.39%	139.19%	\$38,327		\$1,298
5 Trade	14.0	36.46%	82.93%	\$22,836		\$8,326
6 FIRE	3.2	8.33%	135.06%	\$37,190		\$3,099
7 & 8 Services	16.8	43.75%	95.60%	\$26,234		\$11,477
9 Public Admin	1.3	3.39%	112.03%	\$30,850		\$1,044
Total	38.4	100.00%				\$26,489
County Wt. Avg. =				\$27,536		

Total Effect for this Initiative

Effect	Jobs	Average Wage	Contribution to Total Effect
Direct	50.0	\$24,454	\$9,868
Indirect	35.5	\$27,482	\$7,874
Induced	38.4	\$26,489	\$8,210
Total	123.9	Initiative Wt. Avg. =	\$25,952

Table 4.1 reports the estimated increases in output caused by the 50 jobs created by Telephone Services, Inc. Fifty jobs in the “assembly of phone cables and accessories” industry typically add \$10.98 million per year to Hillsborough County’s private-sector output. That equates to \$219,606 per worker – nearly 275% of the countywide output per worker. The indirect jobs produce additional output at more than 126% of the average output per worker, while the induced jobs produce at about 89% of average output. The total impact on productivity of this initiative is over \$17.3 million of increased output. This increased output comes at a rate that is 174.87% of the countywide output per worker. Hence, this job-creation initiative can be expected to promote rising productivity in Hillsborough County.

Table 4.1 also shows the value-added per worker portion of output per worker. Typically, a worker in the “assembly of phone cables and accessories” industry adds \$89,661 to the value of the firm’s products during a year. An average direct wage of \$24,454 (excludes benefits, if any) paid by Telephone Services, Inc. for the 50 newly created jobs seems low in relation to the typical value-added per worker in the industry.

Because the typical output and value-added data may not fully reflect the impact on the Hillsborough County economy in 1997, we also examine output and value-added data for the “assembly of phone cables and accessories” during 1998.⁸ The data indicate that productivity in this industry slightly declined in 1998 from the 1997 level. Output per worker fell to \$208,309 in 1998 from \$219,606 (-5.1%) in 1997; value-added per worker fell to \$72,757 in 1998 from \$89,661 (-18.9%) in 1997.

We find that the Telephone Services, Inc. initiative would tend to decrease the average wage but raise overall productivity in Hillsborough County. However, overall productivity in Hillsborough County in the “assembly of phone cables and accessories” industry declined in 1998 from its 1997 level.

Table 4.1

1997
TELEPHONE SERVICES, INC.
ASSEMBLY OF PHONE CABLES AND ACCESSORIES SIC 36xx
= IMPLAN SECTOR 372
INCENTIVE TYPE: EIFMP
Overall County Output per Worker = \$79,989

Productivity Comparisons

<u>Effect</u>	<u>Jobs</u>	<u>Output</u>	<u>Output per Worker</u>	<u>% of County Output per Worker</u>	<u>Value-added per Worker</u>
Direct	50.0	\$10,980,294	\$219,606	274.55%	\$89,661
Indirect	35.5	\$3,598,276	\$101,360	126.72%	\$56,238
Induced	38.4	\$2,752,207	\$71,672	89.60%	\$46,327
Total	123.9	\$17,330,777	\$139,877	174.87%	\$66,654

⁸ See footnote 7.

During 1997 there were three initiatives under the QTI program: 1) Chase Manhattan Bank, whose Tampa operation was classified as a non-depository, personal credit financial institution, 2) Smithfield (Lykes), a meat processing, packaging and distribution business, and 3) PriceWaterhouse, who provides accounting services.

Table 5 (next page) reports the effects of the 1,330 jobs created at the Chase Manhattan Bank operation with an average wage of \$32,350. We estimate that these 1,330 direct jobs lead to 104.4 full-time equivalent jobs at related industries within Hillsborough County. The 104.4 indirect jobs pay an average wage of \$31,654, which is more than \$4,000 above the countywide average. Additionally, an increase in household consumption spending induces 581.7 more full-time equivalent jobs at an average wage of \$26,461. The induced jobs have an average wage that is slightly more than \$1,000 below the countywide average.

A large portion (42.72%) of the indirect jobs is in the Finance, Insurance, and Real Estate (FIRE) division of the Hillsborough County economy. FIRE is also the division of the economy in which the direct jobs are classified. In Hillsborough County, wages in the FIRE division were 135.06% of the countywide average in 1997. Thus, the indirect jobs on average pay only slightly less than the direct jobs. However, most of the induced jobs are in the Services division (43.82%) and the Trade division (36.46%) of the county's economy. Both Services and Trade pay wages that are on average below the countywide average wage.

The total effect of the Chase Manhattan Bank initiative is 2,016.1 full-time equivalent jobs in Hillsborough County at an average wage of \$30,615. This estimate of the wage impact of the new jobs indicates that the Chase Manhattan Bank initiative would tend to raise average wages for people who work in Hillsborough County.

Table 5

1997
 CHASE MANHATTAN BANK
 FINANCE/MORTGAGE SIC 6141/6142 = IMPLAN SECTOR 457
 INCENTIVE TYPE: QTI
 1330 JOBS
 AVG. DIRECT WAGE **\$32,350**

Indirect Employment Effects

Division Name	Jobs	% of Emp. Impact	Divisional Wage as % of County Weighted Avg. Wage	Divisional Avg. Wage	Div. Avg. Wage times % of Emp. Impact
0 Agriculture	0.1	0.10%	50.90%	\$14,017	\$13
1 Mining	0.0	0.00%	129.64%	\$35,699	\$0
1 Construction	1.1	1.05%	109.85%	\$30,247	\$319
2 & 3 Manufacturing	2.6	2.49%	108.96%	\$30,002	\$747
4 Trans&Pub Util	3.1	2.97%	139.19%	\$38,327	\$1,138
5 Trade	1.9	1.82%	82.93%	\$22,836	\$416
6 FIRE	44.6	42.72%	135.06%	\$37,190	\$15,888
7 & 8 Services	43.8	41.95%	95.27%	\$26,234	\$11,006
9 Public Admin	7.2	6.90%	112.04%	\$30,850	\$2,128
Total	104.4	100.00%			\$31,654
County Wt. Avg. =				\$27,536	

Induced Employment Effects

Division Name	Jobs	% of Emp. Impact	Divisional Wage as % of County Weighted Avg. Wage	Divisional Avg. Wage	Div. Avg. Wage times % of Emp. Impact
0 Agriculture	6.4	1.10%	50.90%	\$14,017	\$154
1 Mining	0.0	0.00%	129.64%	\$35,699	\$0
1 Construction	11.5	1.98%	109.84%	\$30,247	\$598
2 & 3 Manufacturing	11.7	2.01%	108.96%	\$30,002	\$603
4 Trans&Pub Util	19.9	3.42%	139.19%	\$38,327	\$1,311
5 Trade	212.1	36.46%	82.93%	\$22,836	\$8,326
6 FIRE	47.2	8.11%	135.06%	\$37,190	\$3,018
7 & 8 Services	254.9	43.82%	95.60%	\$26,234	\$11,496
9 Public Admin	18.0	3.09%	112.03%	\$30,850	\$955
Total	581.7	100.00%			\$26,461
County Wt. Avg. =				\$27,536	

Total Effect for this Initiative

Effect	Jobs	Average Wage	Contribution to Total Effect
Direct	1330.0	\$32,350	\$21,341
Indirect	104.4	\$31,654	\$1,639
Induced	581.7	\$26,461	\$7,635
Total	2016.1	Initiative Wt. Avg. =	\$30,615

Table 5.1 reports the estimated increases in output caused by the 1,330 jobs created by Chase Manhattan Bank. One thousand three hundred thirty jobs in the “finance / mortgage” industry typically add \$61.15 million per year to Hillsborough County’s private-sector output. That equates to \$45,983 per worker – about 57% of the countywide output per worker. The indirect jobs produce additional output at more than 106% of the average output per worker, while the induced jobs produce at about 89% of average output. The total impact on productivity of this initiative is over \$111.75 million of increased output. The increased output comes at a rate that is 69.3% of countywide output per worker and would be expected to lower productivity in Hillsborough County.

Table 5.1

1997
 CHASE MANHATTAN BANK
 FINANCE/MORTGAGE SIC 6141/6142
 = IMPLAN SECTOR 457
 INCENTIVE TYPE: QTI
 Overall County Output per Worker = \$79,989

Productivity Comparisons

<u>Effect</u>	<u>Jobs</u>	<u>Output</u>	<u>Output per Worker</u>	<u>% of County Output per Worker</u>	<u>Value-added per Worker</u>
Direct	1330.0	\$61,156,912	\$45,983	57.49%	\$38,426
Indirect	104.4	\$8,885,002	\$85,105	106.40%	\$56,618
Induced	581.7	\$41,713,606	\$71,710	89.65%	\$46,351
Total	2016.1	\$111,755,520	\$55,432	69.30%	\$41,655

Table 5.1 also shows the value-added per worker portion of output per worker. Typically, a worker in the “finance / mortgage” industry adds \$38,426 to the value of the firm’s products during a year. The typical value-added in the industry is consistent with the average direct wage of \$32,350 (excludes benefits, if any) paid by Chase Manhattan Bank for the 1,330 newly created jobs.

Because the typical output and value-added data may not fully reflect the impact on the Hillsborough County economy in 1997, we also examine output and value-added data for the “finance / mortgage” industry during 1998.⁹ The data indicate that productivity in this industry substantially increased in 1998 from the 1997 level. Output per worker rose to \$58,577 in 1998 from \$45,983 (27.4%) in 1997; value-added per worker rose to \$55,498 in 1998 from \$38,426 (33.1%) in 1997. This increase in productivity is consistent with the notion that the Chase Manhattan Bank operation,

⁹ See footnote 7.

which began in Hillsborough County in 1997, was more economically efficient than existing “finance / mortgage” activity in the county at that time.

We find that the Chase Manhattan Bank initiative would tend to increase the average wage and lower overall productivity in Hillsborough County. However, there is also a finding that the initiative contributed to an increase in productivity in the “finance / mortgage” industry within the county.

Table 6 (next page) shows the effects of the 275 jobs created at the Smithfield (Lykes) meat processing, packaging and distribution business. The direct jobs have an average wage of \$27,717, which is slightly above the countywide 1997 average of \$27,536. We estimate that these 275 direct jobs generate 332.1 full-time equivalent jobs at related industries within Hillsborough County. The 332.1 indirect jobs pay an average wage of \$21,112, which is over \$6,000 below the countywide average. Additionally, an increase in household consumption spending induces 231.4 more full-time equivalent jobs at an average wage of \$26,465. The induced jobs have an average wage that is a little more than \$1,000 below the countywide average.

The reason for the relatively low average wage for the indirect jobs is that more than half (50.17%) of these jobs is created in the Agricultural division of the economy. In 1997, wages in the Agricultural division paid only 50.9% of the countywide average wage. Another 27.46% of the jobs are in the Services division, which also paid below average wages in 1997. Most of the induced jobs are in the Trade division (36.43%) and the Services division (43.78%) of the county’s economy. These divisions also pay below average wages.

The total effect of the Smithfield (Lykes) initiative is 838.5 full-time equivalent jobs in Hillsborough County at an average wage of \$24,755. This estimate of the wage impact of the new jobs indicates that the Smithfield (Lykes) initiative would tend to decrease average wages for people who work in Hillsborough County.

Table 6

1997
 SMITHFIELD (LYKES)
 MEAT PACKING, PROCESSING, AND DISTRIB. SIC 2013 = IMPLAN SECTOR 58
 INCENTIVE TYPE: QTI
 275 DIRECT JOBS
 AVG. DIRECT WAGE **\$27,717**

Indirect Employment Effects

Division Name	Jobs	% of Emp. Impact	Divisional Wage		Div. Avg. Wage	
			as % of County	Divisional	times	% of Emp. Impact
			Weighted Avg. Wage	Avg. Wage		
0 Agriculture	166.6	50.17%	50.90%	\$14,017		\$7,032
1 Mining	0	0.00%	129.64%	\$35,699		\$0
1 Construction	4.9	1.48%	109.85%	\$30,247		\$446
2 & 3 Manufacturing	12.2	3.67%	108.96%	\$30,002		\$1,102
4 Trans&Pub Util	18.1	5.45%	139.19%	\$38,327		\$2,089
5 Trade	25.8	7.77%	82.93%	\$22,836		\$1,774
6 FIRE	12.0	3.61%	135.06%	\$37,190		\$1,344
7 & 8 Services	91.2	27.46%	95.27%	\$26,234		\$7,204
9 Public Admin	1.3	0.39%	112.04%	\$30,850		\$121
Total	332.1	100.00%				\$21,112
				County Wt. Avg. =	\$27,536	

Induced Employment Effects

Division Name	Jobs	% of Emp. Impact	Divisional Wage		Div. Avg. Wage	
			as % of County	Divisional	times	% of Emp. Impact
			Weighted Avg. Wage	Avg. Wage		
0 Agriculture	2.6	1.12%	50.90%	\$14,017		\$157
1 Mining	0	0.00%	129.64%	\$35,699		\$0
1 Construction	4.6	1.99%	109.84%	\$30,247		\$601
2 & 3 Manufacturing	4.7	2.03%	108.96%	\$30,002		\$609
4 Trans&Pub Util	8.0	3.46%	139.19%	\$38,327		\$1,325
5 Trade	84.3	36.43%	82.93%	\$22,836		\$8,319
6 FIRE	18.8	8.12%	135.06%	\$37,190		\$3,021
7 & 8 Services	101.3	43.78%	95.60%	\$26,234		\$11,484
9 Public Admin	7.1	3.07%	112.03%	\$30,850		\$947
Total	231.4	100.00%				\$26,465
				County Wt. Avg. =	\$27,536	

Total Effect for this Initiative

Effect	Jobs	Average Wage	Contribution to Total Effect
Direct	275.0	\$27,717	\$9,090
Indirect	332.1	\$21,112	\$8,362
Induced	231.4	\$26,465	\$7,304
Total	838.5	Initiative Wt. Avg. =	\$24,755

Table 6.1 reports the productivity increases caused by the 275 jobs created by Smithfield (Lykes). Two hundred seventy-five jobs in the “meat packing, processing, and distribution” industry typically add \$99.92 million per year to Hillsborough County’s private-sector output. That equates to \$363,358 per worker – more than four and one-half times the countywide output per worker. The indirect jobs produce additional output at 68% of the average output per worker, while the induced jobs produce at about 89% of average output. The total impact on productivity of this initiative is over \$134.5 million of increased output. The increased output comes at a rate that is twice the countywide output per worker and would be expected to increase productivity in Hillsborough County.

In contrast with the relatively high-wage, but low-productivity jobs of the Chase Manhattan Bank initiative, these Smithfield (Lykes) jobs are relatively low-wage, but highly productive.

Table 6.1

1997
 SMITHFIELD (LYKES)
 MEAT PACKING, PROCESSING, AND DISTRIB. SIC 2013
 = IMPLAN SECTOR 58
 INCENTIVE TYPE: QTI
 Overall County Output per Worker = \$79,989

Productivity Comparisons

<u>Effect</u>	<u>Jobs</u>	<u>Output</u>	<u>Output per Worker</u>	<u>% of County Output per Worker</u>	<u>Value-added per Worker</u>
Direct	275.0	\$99,923,384	\$363,358	454.26%	\$61,113
Indirect	332.1	\$18,084,955	\$54,456	68.08%	\$30,135
Induced	231.4	\$16,590,747	\$71,697	89.63%	\$46,343
Total	838.5	\$134,599,086	\$160,524	200.68%	\$44,768

Table 6.1 also shows the value-added per worker portion of output per worker. Typically, a worker in the “meat packing, processing, and distribution” industry adds \$61,113 to the value of the firm’s products during a year. An average direct wage of \$27,717 (excludes benefits, if any) paid by Smithfield (Lykes) appears to be somewhat low in relation to the typical value-added per worker in the industry.

Because the typical output and value-added data may not fully reflect the impact on the Hillsborough County economy in 1997, we also examine output and value-added data for the “meat packing, processing, and distribution” industry during 1998.¹⁰ The

¹⁰ See footnote 7.

data indicate that productivity in this industry decreased in 1998 from the 1997 level. Output per worker fell to \$334,736 in 1998 from \$363,358 (-7.9%) in 1997; value-added per worker fell to \$45,982 in 1998 from \$61,113 (-24.8%) in 1997. The high dollar-value output in this industry is attributable to the high cost of intermediate inputs for the meat packing industry. The value-added per worker is in line with most industries in Hillsborough County.

We find that the Smithfield (Lykes) initiative would tend to decrease the average wage but raise overall productivity in Hillsborough County. However, there is also a finding that the initiative contributed to a small decrease in productivity in the “meat packing, processing, and distribution” industry within the county.

Table 7 (next page) displays the effects of the 230 jobs created by PriceWaterhouse accounting services. The direct jobs have an average wage of \$68,700, which is far above the countywide 1997 average of \$27,536. We estimate that these 230 direct jobs generate 19.8 full-time equivalent jobs at related industries within Hillsborough County. The 19.8 indirect jobs pay an average wage of \$27,384, which is just under the countywide average. Additionally, an increase in household consumption spending induces 115.6 more full-time equivalent jobs at an average wage of \$26,464. The induced jobs have an average wage that is a little more than \$1,000 below the countywide average.

The accounting services industry requires little input from other industries in the region. Over 80% of the indirect jobs are in the Services division of the county’s economy, hence the average wage of the indirect jobs falls below the countywide average wage for all jobs. As is usually the case, most induced jobs are in the Trade and Services divisions of the economy resulting in a below countywide average wage for these jobs.

The total effect of the PriceWaterhouse initiative is 365.4 full-time equivalent jobs in Hillsborough County at an average wage of \$53,099. This estimate of the wage impact of the new jobs indicates that the PriceWaterhouse initiative would tend to increase average wages for people who work in Hillsborough County.

Table 7

1997
 PRICEWATERHOUSE
 ACCOUNTING SERVICES SIC 8721 = IMPLAN SECTOR 507
 INCENTIVE TYPE: QTI
 230 DIRECT JOBS
 AVG. DIRECT WAGE **\$68,700**

Indirect Employment Effects

Division Name	Jobs	% of Emp. Impact	Divisional Wage		Div. Avg. Wage times
			as % of County	Divisional	
			Weighted Avg. Wage	Avg. Wage	% of Emp. Impact
0 Agriculture	0.1	0.51%	50.90%	\$14,017	\$71
1 Mining	0.0	0.00%	129.64%	\$35,699	\$0
1 Construction	0.3	1.52%	109.85%	\$30,247	\$458
2 & 3 Manufacturing	0.3	1.52%	108.96%	\$30,002	\$455
4 Trans&Pub Util	0.5	2.53%	139.19%	\$38,327	\$968
5 Trade	0.6	3.03%	82.93%	\$22,836	\$692
6 FIRE	1.4	7.07%	135.06%	\$37,190	\$2,630
7 & 8 Services	16.1	81.31%	95.27%	\$26,234	\$21,332
9 Public Admin	0.5	2.53%	112.04%	\$30,850	\$779
Total	19.8	100.00%			\$27,384
County Wt. Avg. =				\$27,536	

Induced Employment Effects

Division Name	Jobs	% of Emp. Impact	Divisional Wage		Div. Avg. Wage times
			as % of County	Divisional	
			Weighted Avg. Wage	Avg. Wage	% of Emp. Impact
0 Agriculture	1.3	1.12%	50.90%	\$14,017	\$158
1 Mining	0.0	0.00%	129.64%	\$35,699	\$0
1 Construction	2.3	1.99%	109.85%	\$30,247	\$602
2 & 3 Manufacturing	2.3	1.99%	108.96%	\$30,002	\$597
4 Trans&Pub Util	4.0	3.46%	139.19%	\$38,327	\$1,326
5 Trade	42.2	36.51%	82.93%	\$22,836	\$8,336
6 FIRE	9.4	8.13%	135.06%	\$37,190	\$3,024
7 & 8 Services	50.5	43.69%	95.27%	\$26,234	\$11,460
9 Public Admin	3.6	3.11%	112.04%	\$30,850	\$961
Total	115.6	100.00%			\$26,464
County Wt. Avg. =				\$27,536	

Total Effect for this Initiative

Effect	Jobs	Average Wage	Contribution to Total Effect
Direct	230.0	\$68,700	\$43,243
Indirect	19.8	\$27,384	\$1,484
Induced	115.6	\$26,464	\$8,372
Total	365.4	Initiative Wt. Avg. =	\$53,099

Table 7.1 reports the estimated productivity increases caused by the 230 jobs created by PriceWaterhouse. Two hundred thirty jobs in the “accounting services” industry typically add \$11.90 million per year to Hillsborough County’s private-sector output. That equates to \$51,751 per worker – about 65% of the countywide output per worker. The indirect jobs produce additional output at 94% of the average output per worker, while the induced jobs produce at about 89% of average output. The total impact on productivity of this initiative is over \$21.6 million of increased output. The increased output comes at a rate that is 74.2% of the countywide output per worker and would be expected to lower productivity in Hillsborough County.

Table 7.1

1997
 PRICEWATERHOUSE
 ACCOUNTING SERVICES SIC 8721
 = IMPLAN SECTOR 507
 INCENTIVE TYPE: QTI
 Overall County Output per Worker = \$79,989

Productivity Comparisons

Effect	Jobs	Output	Output per Worker	% of County Output per Worker	Value-added per Worker
Direct	230.0	\$11,902,708	\$51,751	64.70%	\$44,766
Indirect	19.8	\$1,482,485	\$74,873	93.60%	\$51,735
Induced	115.6	\$8,301,314	\$71,811	89.78%	\$46,417
Total	365.4	\$21,686,507	\$59,350	74.20%	\$45,666

Table 7.1 also shows the value-added per worker portion of output per worker. Typically, a worker in the “accounting services” industry adds \$44,766 to the value of the firm’s products during a year. The typical value-added in the industry seems disproportionately low in relation to the average direct wage of \$68,700 (excludes benefits, if any) paid by PriceWaterhouse for the 230 newly created jobs.

Because the typical output and value-added data may not fully reflect the impact on the Hillsborough County economy in 1997, we also examine output and value-added data for the “accounting services” industry during 1998.¹¹ The data indicate that productivity in this industry substantially increased in 1998 from the 1997 level. Output per worker rose to \$61,569 in 1998 from \$51,751 (19.0%) in 1997; value-added per worker rose to \$55,498 in 1998 from \$44,766 (24.0%) in 1997. This increase in productivity is consistent with the notion that the PriceWaterhouse operation, which began in Hillsborough County in 1997, was more economically efficient than the existing

¹¹ See footnote 7.

“accounting services” activity in the county at that time. Furthermore, the disproportionately low valued-added for the industry vis-a-vis the average wage of this initiative, as mentioned above, may reflect that the PriceWaterhouse operation adds a greater value to the firm’s output than was typical for the industry in Hillsborough County.

We find that the PriceWaterhouse initiative would tend to increase the average wage but lower overall productivity in Hillsborough County. However, there is also a finding that the initiative substantially contributed to an increase in productivity in the “accounting services” industry within the county.

Predictive Models.

The predictive models are based on a wage of \$27,536, which is the weighted-average wage in Hillsborough County for 1997. All observations are stated as a percentage of this weighted-average wage. We form predictive models for the QTI program.¹² The models in each group describe the trend line for 1) indirect wages as a function of direct wages, 2) induced wages as a function of direct wages, and 3) total wages as a function of direct wages. That is, given the average direct wages as a percentage of the county’s weighted-average wage, the trend lines predict indirect, induced, and total wage percentages.

The QTI predictive models are derived from three observations. Therefore, we acknowledge that the models may not have general applicability across a wide range of wage levels. The predictive models are shown in **Table 8** (next page).

The slope of the trend line shows the percentage increase in the dependent variable with respect to a 100% increase in a project’s average direct wage relative to the countywide weighted-average wage. For example, note from Table 8, that the slope of the function that relates indirect wages to direct wages is 0.02631. The y-intercept is 0.91810. Hence, the trend line is: indirect wages = 0.91810 + 0.02631* (direct wages). Suppose a project’s average direct wage was equal to (100% of) the countywide weighted-average wage. Then, the model predicts that indirect wages will be 94.441% of the countywide weighted-average wage. The prediction equation is $.94441 = .91810 + .02631 * (1.0)$.

The predictive models also reveal that there is very little variation of induced wages with respect to the direct wages. Induced wages will generally be about 96% of the countywide weighted-average wage and increase by only 0.001% for a project with average direct wages equal to the countywide weighted-average wage.

Furthermore, a predictive model can be used to estimate the direct wage necessary to generate total wages that are equal to the countywide weighted-average wage. This is

¹² Because the two EIFMP observations both have the same average direct wage, it is not mathematically possible to establish a trend line for prediction.

an interesting prediction because an average total wage less than the countywide average would tend to reduce the average wage of people working in Hillsborough County. The prediction equation is: $1.0 = 0.27846 + 0.66373$ (direct wages). Solving this prediction equation, we estimate that direct wages equal to 108.71% of the countywide weighted-average wage would be necessary to generate a total average wage equal to 100% of the countywide average.

Table 8

1997

Predictive Models

QTI Program

Project	Direct	Indirect	Induced	Total
Chase Manhattan Bank	1.17483	1.14957	0.96097	1.11181
Smithfield (Lykes)	1.00657	0.76670	0.96110	0.89902
PriceWaterhouse	2.49492	0.96107	0.96107	1.92836

Function (f)	Slope	y-Intercept
Indirect = f(Direct)	0.02631	0.91810
Induced = f(Direct)	0.00002	0.96102
Total = f(Direct)	0.66373	0.27846

Conclusion.

The purpose of job-creation programs, like the QTI and EIFMP, is often stated as the improvement of the economic situation of the residents of the region. In 1997, the EIFMP required a wage of \$24,454 or higher and the QTI program required a wage of at least 115% of the statewide, county, or metropolitan area average wage. These wage-rate conditions only applied to the direct jobs. Thus, program conditions do not consider the indirect and induced effects of jobs created by the program.

While an increasing average annual wage in a region may be interpreted as an improvement in the economic situation of the region's residents, increasing productivity is the key to raising living standards and regional competitiveness. That is so, because if workers produce more in a specified time period, firms can sell more, boost profits, and raise incomes at the same time without necessarily raising prices. Hence, a preferred job-creation initiative is one that raises both average wages and average productivity.

In 1997 there were five job-creation initiatives approved in Hillsborough County. The Employers Impact Fee Mitigation Program (EIFMP) governed two initiatives and the provisions of Florida's Qualified Target Industry (QTI) Tax Refund Program guided three initiatives.

Both of the EIFMP initiatives reported average wages of \$24,454, which was the minimum requirement for the program in 1997. These two initiatives included the creation of 75 jobs. These 75 jobs generated 90 more jobs. The weighted-average wage for these 165 jobs was \$25,822 or \$1,714 below the countywide average for all jobs in

Hillsborough County at that time. Thus, these initiatives would mathematically lower the overall average wage, but because the 165 jobs represented such a small percentage of total jobs in the county, the wage impact was virtually zero.¹³

One of the EIFMP initiatives would be expected to have a minimal effect on worker productivity in Hillsborough County with a total effect on productivity estimated at 98.81% of the overall level of output per worker countywide. The other EIFMP initiative would be expected to increase worker productivity with its total effect estimated to be 174.87% of the overall level of output per worker countywide. For all of the jobs generated by the two EIFMP initiatives, the weighted-average effect is typically output per worker at 164% of overall worker productivity. However, as with the effect on average wages, the 165 jobs associated with these initiatives are so few that the productivity impact was virtually zero.

The total effects of the 1997 EIFMP initiatives are ambiguous. The initiatives tend to decrease average wages for workers in Hillsborough County, while typically raising output per worker overall.

The three QTI initiatives reported average wages ranging from \$27,717 to \$68,700 per new job and included the creation of 1,835 jobs. These 1,835 jobs generated 1,385 more jobs. The average wage for these 3,220 jobs was \$31,641 or \$4,105 above the average for all jobs in Hillsborough County in 1997. We estimate that the combined impact of the QTI initiatives was to raise average wages in Hillsborough County by \$27.50 per annum per person working in the county. However, individually the Smithfield (Lykes) initiative resulted in 838.5 jobs with an average wage below the countywide average, thereby dampening the combined impact of the QTI initiatives on wages.

Only one of the three QTI initiatives typically would be expected to have a positive effect on output per worker in Hillsborough County. The positive effect is estimated at 200.68% of the overall level of output per worker countywide. The remaining two QTI initiatives were expected to generate jobs with productivity at 69.3% and 74.2% of the county wide level, respectively. For all of the jobs generated by the three QTI initiatives, the weighted-average effect is typically output per worker at 141% of overall worker productivity.

We have selected average wages and productivity as measurements for this economic analysis. However, our selection does not imply that these are the only possible measures of expected economic improvement, and consequently the sole measures of the efficacy of either the QTI or the EIFMP initiative.

From the predictive model, we can conclude that setting the minimum requirement for QTI program initiatives in 1997 above 108.71% of Hillsborough County's weighted-average wage would provide assurance that the ripple effect of economic activity would not result in decrease in the countywide average wage.

¹³ According to ES202 data, in January 1997 there were 480,399 people employed in Hillsborough County.

Recommendation.

The findings illustrate the difficulty of objectively evaluating a job-creation program. The evaluation clearly depends on the intended purpose of the program. A goal such as to “improve the economic situation” is too vague. Therefore, it is recommended that the implementing authority for any job-creation initiative include a specific and measurable criterion or criteria upon which the efficacy of the program may be evaluated.