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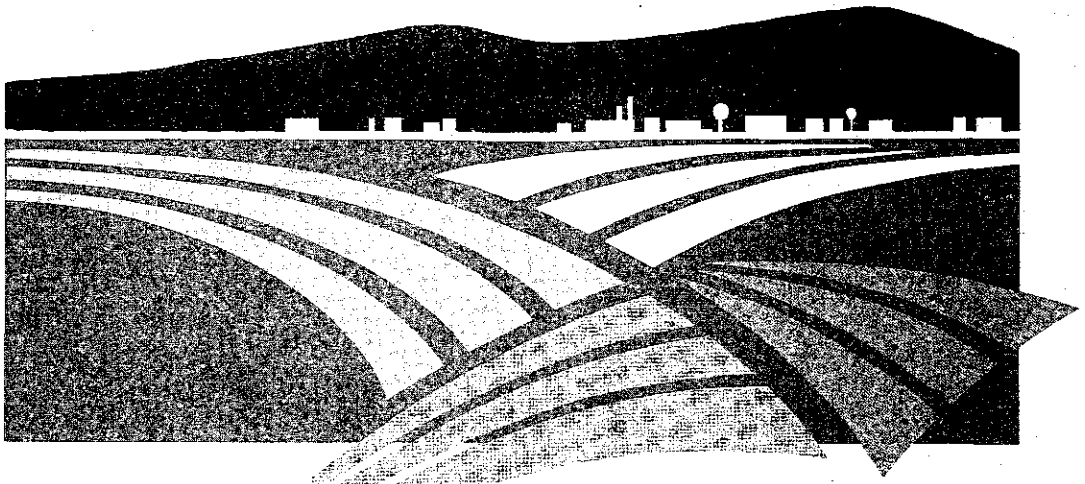

Virginia's
Rural Economic Analysis Program

Department of Agricultural Economics
College of Agriculture and Life Sciences
Virginia Tech

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EXECUTIVE SUMMARY

Significant economic and fiscal impacts would occur in rural Halifax County, Virginia, following an increase in swine production of 5000 sows, along with the corresponding finishing capacity. Whether the production increase occurred through contract or independent operations, the impacts would include the following:

- 114 temporary construction jobs created;
- 73-83 permanent jobs created;
- $55-$75 increase in per capita income;
- almost $3 million increase in retail sales during construction;
- over $1 million permanent increase in retail sales;
- $13-$14 million increase in the real property tax-base;
- $1-$2 million increase in the personal property tax-base;
- reduction of $78,000 to $85,000 in the tax-burden on the existing tax-base to provide the same level of services.

These impacts would be expected to differ slightly among counties with different current economic and tax situations.

Acknowledgments

The authors thank Thomas Johnson for his assistance in using the economic models, and Carroll's Foods of Virginia, Inc. for supplying data for the analysis. The thoughtful comments of many reviewers are also greatly appreciated.

INTRODUCTION

The potential expansion of Virginia's hog-production industry as an economic development opportunity has generated increasing interest in the 1990s. From 1980 to 1985, cash receipts from the sale of hogs in Virginia averaged over $113 million per year. Between 1986 and 1990, the average decreased by more than one-third to approximately $75 million. Regaining, and possibly increasing, this lost economic activity would provide significant economic opportunities for many rural Virginia counties.

For three reasons, Virginia is in a unique position to expand the state swine production industry. First, a large demand for hogs exists in the state. Smithfield Foods, Inc. is one of the five largest hog packers in the United States, but Virginia raises less than 15 percent of the hogs Smithfield processes. Second, opportunities exist in Virginia for both contract and independent production, because, since 1989, Carroll's Foods of Virginia has offered contracts for producing feeder pigs and finishing hogs. Potential producers may, therefore, choose the production style that best fits their own situation. Third, swine production, when managed correctly, can provide needed income to Virginia's farmers, either on a full-time or part-time basis.

Potential expansion of Virginia's swine production industry can obviously benefit individual producers, but such expansion also would have an impact on local communities. As with any industry, swine-industry expansion into an area has direct and indirect impacts. For example, as swine production increases, workers are hired on the farms for a specified wage; the direct effect is to increase community employment and income. Indirect effects occur as the swine operations spend money buying supplies and materials such as feed, medicines, or electricity. As sales increase in these industries, they must eventually hire additional help. The increases in employment and income in other industries are thus caused indirectly by the swine-industry expansion. Similarly, wages paid to new employees are spent on additional goods and services, generating still more employment and income. Of course, not all of the new economic activity occurs within the community boundaries. Part of the money will be spent on purchases outside the area, so the total effects are not realized within one community.

The purpose of this study was twofold: first, to determine the economic and fiscal impacts of increasing hog production in one rural Virginia county; and second, to compare the results

from increasing contract versus independent production. Expansion in the swine industry is not likely to follow strict county boundaries, but economic and fiscal impacts are most easily measured and understood within a governmental jurisdiction, such as a county, city, or state.

The Study Area

Much of the interest in expanding the Virginia swine industry has developed in the "Southside" region of the state (Figure 1). Southside Virginia is a rural area with a very low population density compared to the more rapidly expanding sections of Virginia. The area is relatively close to the Smithfield packing plant and is serviced by the Norfolk-Southern railroad. At the same time, agriculture in Southside has traditionally been oriented towards tobacco, a crop whose production declined in the 1980s. Therefore, the area needs alternative agricultural enterprises, especially those that provide economic development opportunities.

Halifax County and the city of South Boston were selected for determining the economic and fiscal impact from increasing swine production (Figure 1). (Hereafter, the terms "Halifax County" and "Halifax" will be used to mean both the county and the city of South Boston, which is encompassed by the county.) Halifax County would provide a logical location for additional feed-handling capacity to service increased hog production in Southside Virginia, because it lies within fifty miles of existing hog-production facilities, and research has shown 50 miles to be, under most circumstances, the maximum distance for economic truck hauling of prepared feed. With the county hog inventory having fallen from its 1979 peak of 7900 to only 2800 in 1990, there is now a great deal of interest in expanding the swine sector in the county. Two new contract operations were started in the county in the summer of 1992, and there has been additional interest in both contract and independent production throughout the county. (For more details on Halifax County, see Appendix A.)

Swine Industry Expansion

Swine-industry expansion can occur through contract or independent operations. These two production arrangements differ in their operations, investments, and potential returns.

Swine-production contracts are now available in Southside through Carroll's Foods of Virginia. Producers can either produce feeder pigs or finish hogs under a contractual arrangement where the company supplies the hogs, feed, management assistance, veterinary care, record-keeping system, and animal pick-up and delivery. The grower must supply the facilities, repairs and maintenance, labor and management, utilities, record-keeping, property taxes, and insurance. Under these arrangements, the grower is paid a fixed return based on the number of animals (or pounds) produced, plus an incentive based on performance.

The feeder-pig production and feeder-pig finishing contracts differ significantly in investments and compensation (Table 1). The feeder-pig production contracts require large capital investments and a full-time commitment from the owner. They involve hiring additional labor, and they provide enough income to be the primary farm enterprise. The finishing contracts require substantially less capital and owner-time commitment. A single finishing unit requires approximately one hour per day, although several finishing floors can be built on the same farm. Finishing contracts are of particular interest to those looking for a part-time enterprise.

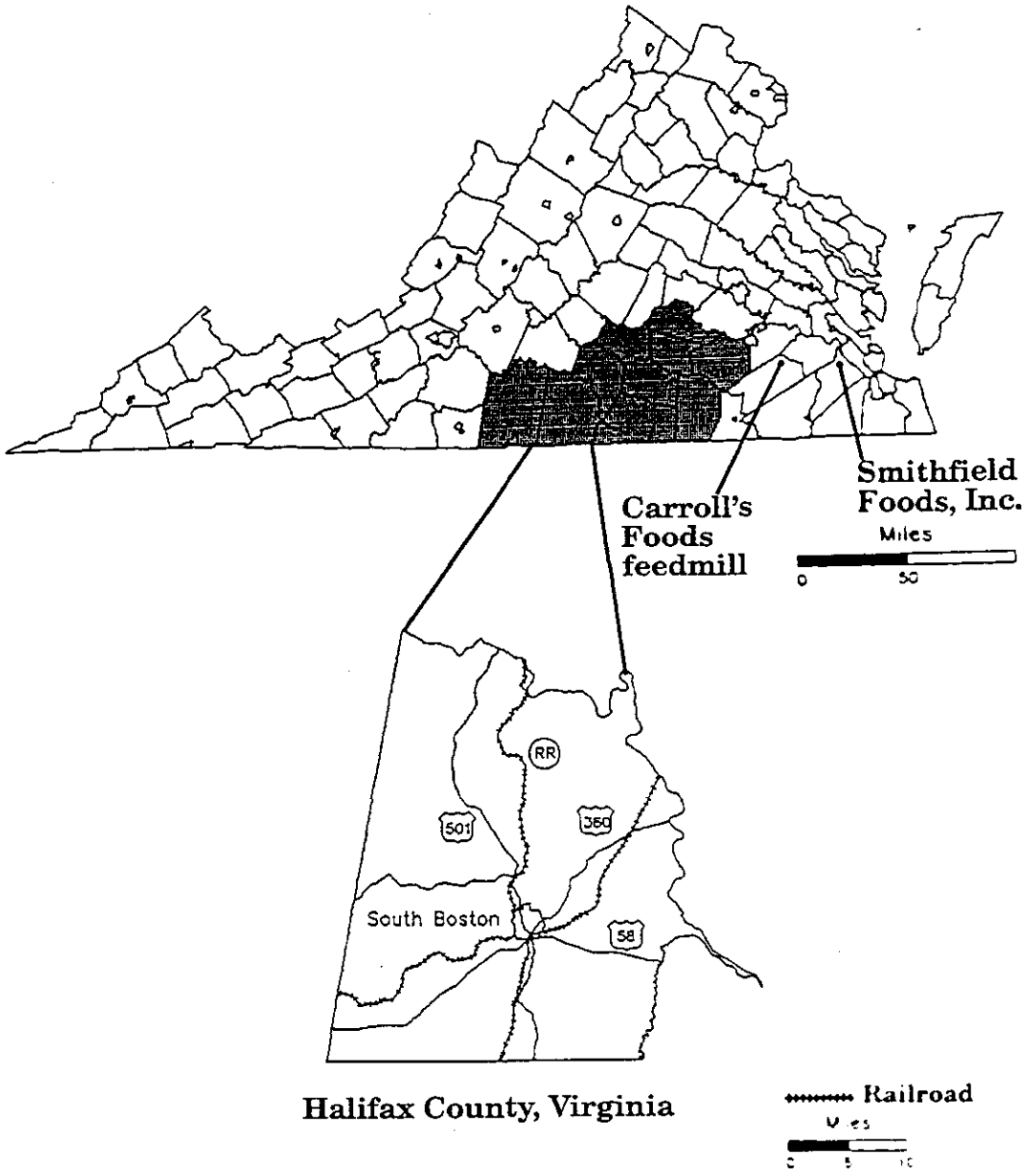

FIGURE 1. Southside Virginia with the study area: Halifax County and the city of South Boston.

Independent hog production continues to be an option for producers in Southside. An independent producer will control all aspects of the operation but will also bear all the risks from variable feed and hog prices. Independent operations can vary greatly in size and productivity. One example of a typical investment and returns is shown in Table 1 for a well-managed, 500-sow, farrow-to-finish operation. Based on 15-year historical Farmville corn prices and Smithfield hog prices, annual net returns to operator labor and management in this operation would have ranged from -$150,932 to $501,414.

This is just one example of the possible net returns; in general, net returns will depend on how operators respond to cyclical hog prices and feed costs. Hog prices were low in 1980 and 1981, and feed costs were high. If the facilities were paid for in these years, the net returns to operator labor and management would have been much higher than in the example above. In contrast, in 1987 and 1990, hog prices were high and feed costs were low. The facilities loan could have been serviced and still provide a good net return to the operator.

The cyclical pattern of hog prices makes it possible to predict fairly accurately when high and low price patterns will occur. The operator can then plan construction so that the majority of the debt is serviced during the high-price years.

Regardless of when hog production begins, an independent producer will face a start-up period of approximately one year before market hogs are ready for sale. Additional cash reserves are needed for this period. In the returns shown in Table 1, additional borrowings were included to cover the start-up costs.

The expected compensation and the risk exposure are higher for independent operations than for the contract production units. Returns in the contract operation are much less variable than in the independent operation. The contracting company bears the risk of changing hog and feed prices, and the operator assumes only the production risk. Projected annual returns under contract are $4,747 for the finishing floor and $34,408 and $52,702, respectively, for the 600-sow and 1000-sow feeder-pig producers.

TABLE 1. Typical investment and expected compensation from various forms of hog production systems.

	Contract Production			Independent Production
	Finishing Feeder Pigs	Producing Feeder Pigs		Farrow-to-Finish
Size	720-head[a]	600-sow[b]	1000-sow[c]	500-sow[d]
Facilities Investment	$64,500	$510,000	$834,000	$825,000
Expected Annual Cash Costs	$3,305	$32,850	$56,000	$713,035
Hired Labor (no)	0	2	4	2
Salary	0	$36,000	$64,000	$27,300
Owner Time Required (avg)	1 hr/day	50 hr/week	50 hr/week	50+ hr/week
Expected Compensation				
year 1-10	$4,747	$34,408	$52,702	$66,774
year 11-15	$15,239	$119,910	$192,870	$352,164

Assumptions:

[a] 2.8 groups/year; 3% death loss; in/out weights 50/235 lbs; 2.8 feed conversion; payment based on $0.03 per pound of gain plus $3.00 per head for each 1.0 feed conversion <4.0; 10% financing for 10-years.

[b] 19.76 pigs sold per sow per year; payment based on $14.75 per pig sold plus $0.25 per pig for every 1/2 pig per sow per year over 16.5; 10% financing for 10-years.

[c] 19.76 pigs sold per sow per year; payment based on $14.75 per pig sold plus $0.25 per pig for every 1/2 pig per sow per year over 16.5; 10% financing for 10-years.

[d] 9 pigs weaned per litter; 2.08 litters per sow per year; 3.85 whole herd feed conversion; $1.50 per hundredweight market hog price premium; Farmville corn price plus $0.25 margin; all feed is purchased; 10% financing for 10 years with an additional $340,000 borrowed to cover start-up costs.

How Economic Impact is Measured

The Virginia Impact Projection (VIP) model[1] was used to measure the impact of increasing swine production in Halifax County. VIP uses estimates of the demographic, expenditure, and revenue conditions within a locality to project future fiscal and economic conditions for that locality. These values are used to establish a *baseline* that indicates how the population and economic conditions would change over time according to current trends without any outside "shocks" or changes to the current situation. Once the baseline is established, changes are introduced to determine their impact.

In this study, the VIP model baseline was established from population and economic conditions existing in Halifax County in 1989. This baseline showed how the conditions would change by 1998 if no hog-production increase occurred. Then, the model was used to determine how adding swine operations would affect the county's population and economy. The VIP models projected annual impacts through 1998, with 1989 as the base year, and with the swine operations added in 1992 and 1993.

A second model was needed to supply input data to the VIP model. The Impact Analysis for Planning (IMPLAN) input-output model, based on 1985 conditions in the county, provides *multipliers* for five measures of economic activity: total industry output, county personal income, total income, value added, and employment.[2] Multipliers indicate how a given economic change will affect other sectors of the economy. For example, if the personal-income multiplier for swine production in a locality is 1.5, then for each $1 of direct employee compensation generated by the industry, 50 cents of additional employee compensation is created in that locality. Similarly, if the employment multiplier is 2, then for each new job created directly by the swine industry, another job is created elsewhere in the community.

The VIP and IMPLAN models were used to measure the impact of increasing hog production within Halifax County under two different situations. In the first situation, contract swine production was increased by 5000 sows and 50 finishing floors. In the second situation, independent hog production was increased by 5000 sows in farrow-to-finish operations. The details of these scenarios are presented in the following sections.

Each scenario consists of two stages: construction and operation. The VIP model is calculated on an annual basis and assumes that construction of all swine units takes place in the first part of 1992. All construction labor is hired locally. Market hog sales begin in the last part of 1992 for the contract operations and in 1993 for the independent operations. In the independent operations, pigs are raised from farrow-to-finish, rather than from farrow-to-feeder or feeder-to-finisher as in the contract operations.

The direct input information for the contracting operations was supplied by Carroll's Foods of Virginia, Inc. (see Appendix B for details). The information for the independent operations was obtained from *Virginia Simulated Hog Returns, 1977-1988: Growing versus Buying Corn* (Thornsbury and Kenyon) with modifications made to reflect Halifax County (see Appendix C for details).

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1 The Virginia Impact Projection (VIP) model is actually a series of models for Virginia counties and cities developed under the leadership of Dr. Thomas G. Johnson, Department of Agricultural Economics, Virginia Tech.

2 The Impact Analysis for Planning (IMPLAN) model was developed by the U.S. Forest Service to measure economic impacts on 528 different sectors of the economy.

CONTRACTING OPERATION SCENARIO

In this scenario, five 600-sow units, two 1000-sow units, fifty 720-head finishing floors, and a leased feed-transfer facility were added in Halifax County. All of the hogs were produced under production contract. Feed for the hogs was mixed in the company feedmill in Waverly, Virginia (see Figure 1), transported by rail to Halifax, and then distributed to the farms by truck.

Results

The increased hog production under the contracting scenario had direct effects in employment, investment, and income (Table 2). The total investment in new facilities was $7.8 million. A total of 32 farm jobs and 26 new support positions were created. The support positions included 2 service technicians, 3 mechanics, 12 truck drivers, 6 "load-out" personnel, 1 dispatcher, and 2 supervisors. An additional 78 jobs were added during the construction phase. The IMPLAN multipliers indicated that 42 additional jobs would be created in 1992. In 1993 and beyond, the 58 farm and support positions created an additional 15 jobs for a total increase of 73 jobs.

TABLE 2. Scenario description of the swine contracting model.

Location: Halifax County

Number of Sows: 5000
5 600-Sow Units
2 1000-Sow Units

Number of 720-head Finishing Units: 50

Feed Transfer Facility

Direct	600 sow	1000 sow	720 head	total
Building Investment:	$2,550,000	1,668,400	3,600,000	7,818,400
Direct Employment:				
Farm	15	10	7	32
Construction	30	14	34	78
Support				26
				136
Direct Income:				
Farm	$352,040	233,404	157,050	742,494
Construction	407,384	193,155	475,054	1,075,593
Support				450,000
				$2,268,087

Multipliers (Calculated from the IMPLAN model results):

	Personal Income	**Employment**
1992	1.49	1.39
1993	1.26	1.25

Personal income equalled slightly over $1 million for the construction positions, $740,000 for the farm positions, and $450,000 for the support positions. Again, after the multipliers were applied, county income levels rise $2.49 million in 1992 and $1.5 million in 1993.

The increase in real property tax-base was equal to the investment cost in facilities, or

$7,818,400. The increase in personal property equalled $1,740,000, estimated as the cost of the trucks required to move feed and hogs and an additional pick-up truck each for the farm managers and service technicians. The increase in retail sales subject to sales tax was substantial ($2,244,152) during 1992 when construction materials are purchased. This dropped to $110,000 during 1993 when most of the inputs were supplied by the contracting company.

Projected county conditions with and without the addition of swine enterprises are shown in Table 3. For each item (population, labor force, etc.), "Baseline" indicates the county economic and fiscal changes over time based on current trends, without the addition of the swine enterprises. "Change" indicates the changes from this baseline that occurred when the swine enterprises were added to the county.

TABLE 3. Halifax County contract swine-production scenario results.

Item		1989	1992	1993	1998
Population (no.)	Baseline[a]	26036	27022	27226	27703
	Change[b]		333	166	163
Labor Force (no.)	Baseline	14288	14829	14941	15203
	Change		183	91	89
Employment (no.)	Baseline	4877	5053	5089	5174
	Change		149	73	73
Unemployment (no.)	Baseline	1029	1066	1074	1092
	Change		-6	-3	-3
Unemployment rate (%)	Baseline	7.2	7.19	7.19	7.18
	Change		-.13	-.06	-.06
Per Capita Income ($)	Baseline	13,273	15,129	15,804	19,658
	Change		91.09	55.01	55.01
Retail Sales ($1000)	Baseline	96,158	98,932	99,788	102,207
	Change		2,957	1,717	1,097
Real Property ($1000) Tax-Base	Baseline	434,029	502,764	526,145	650,880
	Change		7,718	12,079	12,881
Personal Property ($1000) Tax-Base	Baseline	59,736	66,576	68,783	79,995
	Change		955	2,252	2,337
Government Revenues ($1000)[c]	Baseline	23,538	25,206	25,645	28,456
	Change		263	154	156
Government Expenditures ($1000)	Baseline	26,456	29,158	30,066	34,882
	Change		291	190	202
Change in Tax-burden on the Old Property Tax Base ($)[d]			-31,738	-65,829	-85,385

[a] Projected future level without the addition of new swine enterprises.
[b] Projected change from the baseline with the addition of the swine enterprises.
[c] Revenues from income sources other than tax assessed on real and personal property.
[d] The change in the tax-burden that would be assessed against the original tax payers as a result of increasing the real and personal property tax-bases through the addition of the swine enterprises.

The driving force in this scenario was the change in employment. With the addition of the hog operations, 149 jobs were created in 1992 and an additional 73 permanent jobs were created after 1993 (Figure 2). As new jobs were created, some positions were filled by workers moving into the area and bringing their families to Halifax County. The population was projected to increase an additional 333 people over the baseline in 1992 with 163 additional people remaining in 1998. The increase in employment and population led to an increase in the labor force as the number of people in the county rose and as people reentered the labor force in response to the new activity.

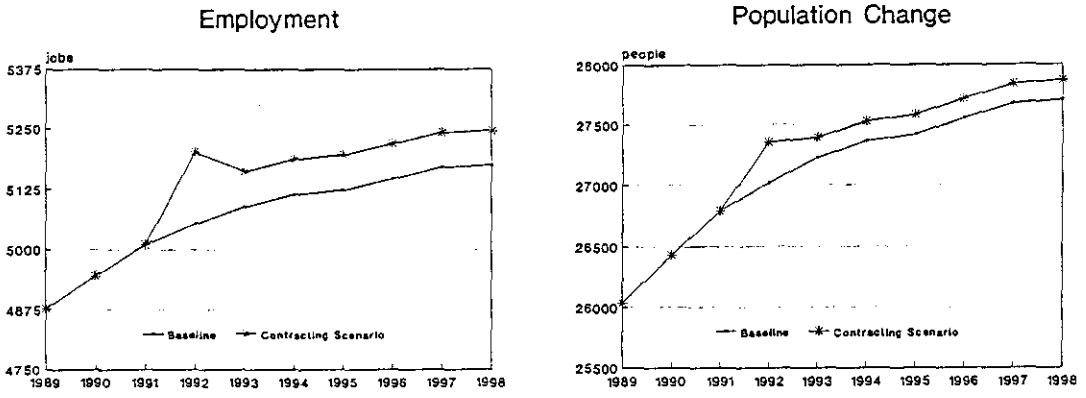


FIGURE 2. Results of the contracting model: projected employment and population changes.

Although the number of jobs increased by 149 in 1992 and 73 in 1993, the number of unemployed fell by only 6 and 3, respectively. The new jobs were filled by workers from five different sources. First, some county residents were hired that were previously unemployed (in this case 6 and 3). Second, some people who were previously commuting out of the county to work were now working in the county. Third, some people who were previously living and working in neighboring counties were now commuting to Halifax to work. Fourth, some people moved into Halifax to work (increasing population). Finally, some people who were not previously in the labor force began working in response to the new activity. The unemployment rate dropped 0.13 percent in 1992 and 0.06 percent in 1998 (Figure 3). The per capita personal income rose $91.09 in 1992 and $55.01 in 1993. This generated additional county income of $2,491,769 in 1992, $1,506,834 in 1993, and $1,532,909 in 1998.

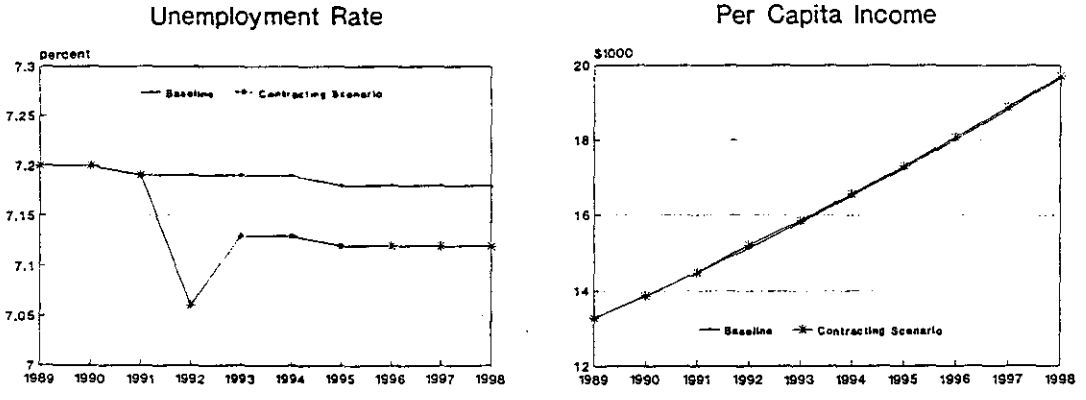


FIGURE 3. Results of the contracting model: projected changes in unemployment rate and per capita income.

Retail sales (purchases subject to state sales tax) increased significantly in 1992 as a result of the new construction activity. The increase in sales was not as great in subsequent years, but the hog enterprises continued to increase retail sales 1-2 percent over the level projected without any changes (Figure 4).

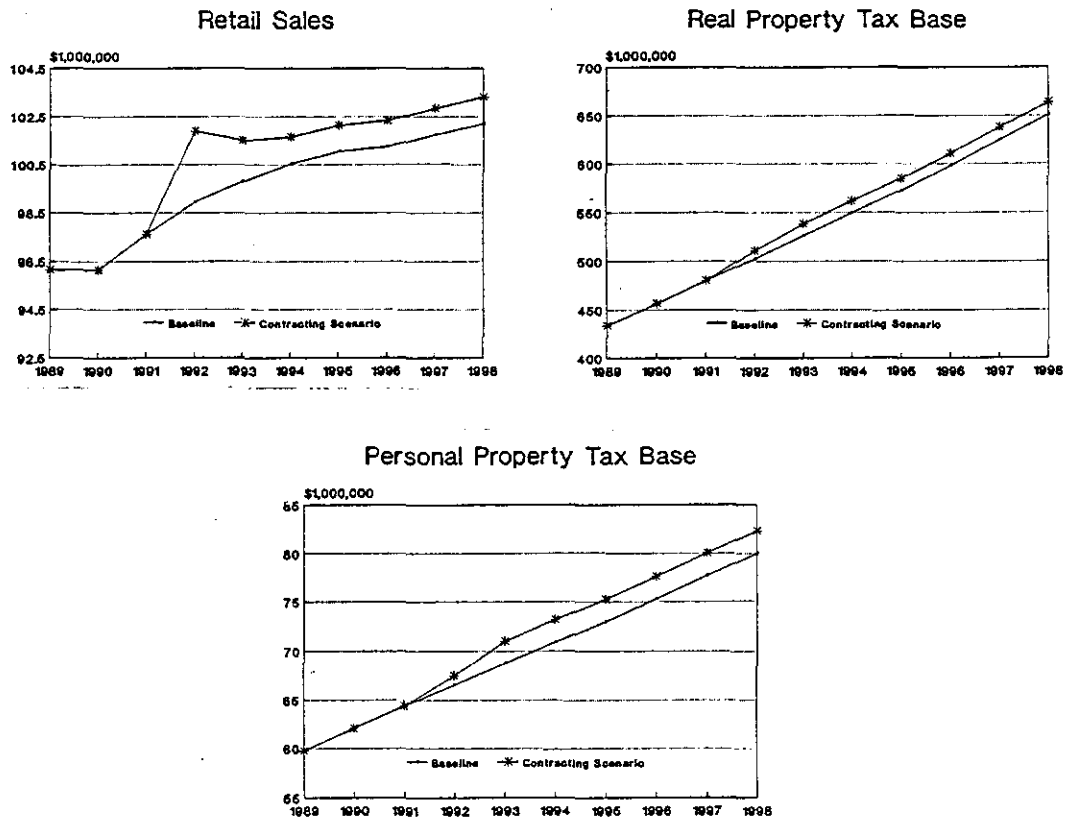


FIGURE 4. Results of the contracting model: projected changes in retail sales, real property tax base, and personal property tax base.

The county tax-base was also increased over the baseline by the hog enterprises (Figure 4). The real property tax base exceeded the baseline by almost $8 million in 1992 and over $12 million in 1998. Similarly, the personal property tax base exceeded the baseline by almost $1 million in 1992 and over $2 million in 1998.

Another measure of the county's fiscal activity is the government revenue received from sources other than the personal and real property tax assessments. This includes state and federal aid and money returned from the state sales tax. Between 1989 and 1998 these revenues were projected to increase from $23.5 to $28.5 million with the swine enterprises adding another $150,000 to $200,000 each year. County expenditures as well as county revenues increased with the new economic activity. Increased population led to increased expenditures on schools, roads, police, fire, etc.

A final measure of county impact was the change in tax-burden on the old property tax-base. Tax burden is measured as the difference between county expenditures and county revenue from non-property tax sources. In the Halifax County model, the reduction in the tax burden ranged from $32,000 in 1992 to $85,000 in 1998, indicating a lower tax rate could be assessed

on the old property tax base after the introduction of the swine enterprises to provide the same level of services. In 1991, there were 21,606 taxable real property holdings in Halifax County. With the addition of the swine enterprises, the amount due on each taxable unit could fall by approximately $4 and the same level of services maintained.[3]

INDEPENDENT OPERATION SCENARIO

In the independent production model, ten 500-sow, farrow-to-finish units are added in Halifax County. All of the hogs are raised in independent operations. No additional corn and soybeans are produced in Halifax County, but the feed is purchased from surrounding feedmills and feed dealers based on historical purchasing patterns. Returns to independent hog production are higher and less variable when feed is purchased rather than produced (Thornsbury and Kenyon).

Results

The direct effects of the increased hog production under the independent scenario are shown in Table 4. Thirty farm jobs and 78 construction jobs were created during 1992. No support personnel (trucking, service) were employed directly by the hog operations in this situation. Rather, the swine operations purchased these services in the community, so, while the number of people employed directly was lower, the employment multiplier was higher than in the contracting situation. After the multipliers were applied, 114 jobs were created during construction in 1992 and 83 permanent jobs were created after 1993.

TABLE 4. Scenario description of the county independent model.

Location:	Halifax County	
Number of Sows:	5000 10 500-Sow Units	
Direct Building Investment:	$8,250,000	
Direct Employment:		
Construction		78
Farm		30
		108
Direct Income:		
Construction	$1,090,664	
Farm	$1,260,050	
	$2,350,714	

Multipliers (Calculated from the IMPLAN model results):

	Personal Income	Employment
1992	1.64	1.46
1993	1.52	2.77

[3] For an explanation of how the change in the tax burden was calculated, please contact the authors at the Department of Agricultural Economics, Virginia Tech.

Personal income levels were slightly over $1 million for the construction positions and $1.25 million for the farm positions. After the multipliers were applied, county income rose by $1.78 million in 1992 and by $2.4 million in 1993.

The increase in the real property tax-base was $8,250,000, equal to the investment in new facilities. The increase in the personal property tax-base was $225,000, the cost of an additional pick-up for each farm owner and for every two employees.

Retail sales increased substantially, $2.3 million, during 1992 as construction materials were purchased. In 1993, they increased less than $200,000. Because the VIP model only considers as retail sales those sales subject to state sales tax, the retail sales result underestimates the amount of money actually spent in the county by these operations. Because Virginia producers are exempt from paying sales tax on materials used to produce farm products for future sale, feed costs, for example, are not included in the VIP model as retail sales. But feed costs represent approximately 60 percent of the total cost in a farrow-to-finish operation, so feed purchases add a significant amount of economic activity to the county. Ten 500-sow operations would spend over $6 million on feed each year.

The IMPLAN model, however, does take into account expenditures not subject to sales tax, and the model was used to determine the impact of those expenditures on the county. Results from the IMPLAN model indicated that an additional 2 cents from every dollar spent on feed grains would remain in Halifax County. An additional 96 cents from every dollar spent on oil-bearing crops (soybeans) would remain. The rest would be spent outside the county line, stimulating economic activity within the region.

Projected county conditions with and without the addition of independent swine enterprises are shown in Table 5. An additional 114 jobs were created over the baseline in 1992 and 83 permanent jobs were created in 1993. These positions reduced the unemployment rate by approximately four people (.07%) in each year (Figure 5). The other positions were filled from a combination of new job seekers, new residents, and commuters into the county.

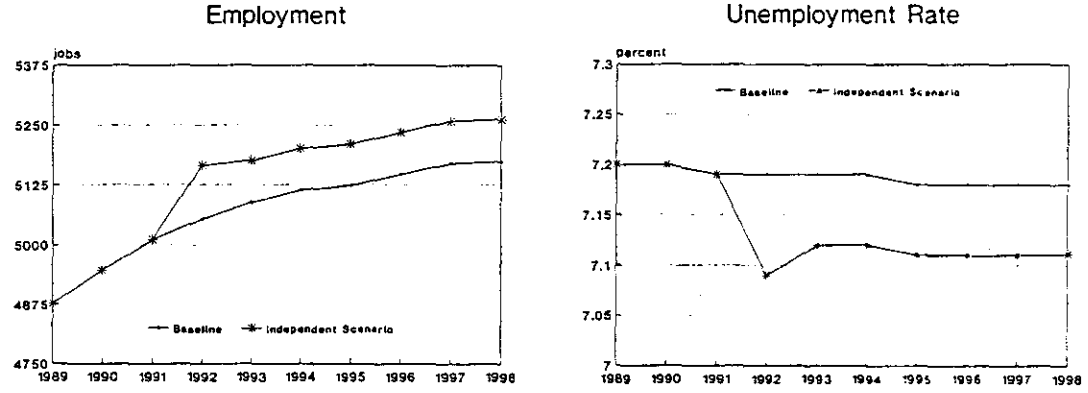


FIGURE 5. Results of the independent model: projected changes in employment and the unemployment rate.

As the number of jobs in the county rose, the county population also increased more than it would have without the swine operations (Figure 6). The number of residents grew by 255 over the baseline in 1992 and 182 in 1998. County per capita personal income rose $65.41 in 1992 for a total increase in county income of $1,783,992 over the baseline. The income rose $75.14 per person in each subsequent year for an annual county increase of over $2 million over the baseline.

TABLE 5. Halifax County independent swine-production scenario results.

Item		1989	1992	1993	1998
Population (no.)	Baseline[a]	26036	27022	27226	27703
	Change[b]		255	185	182
Labor Force (no.)	Baseline	14288	14829	14941	15203
	Change		140	102	100
Employment (no.)	Baseline	4877	5053	5089	5174
	Change		114	83	83
Unemployment (no.)	Baseline	1029	1066	1074	1092
	Change		-4	-3	-4
Unemployment rate (%)	Baseline	7.2	7.19	7.19	7.18
	Change		-.10	-.07	-.07
Per Capita Income ($)	Baseline	13,273	15,129	15,804	19,658
	Change		65.41	75.14	75.14
Retail Sales ($1000)	Baseline	96,158	98,933	99,788	102,207
	Change		2,851	1,568	1,312
Real Property ($1000) Tax-Base	Baseline	434,029	502,764	526,145	650,880
	Change		5,771	13,416	14,307
Personal Property ($1000) Tax-Base	Baseline	59,736	66,576	68,783	79,995
	Change		719	831	897
Revenues ($1000)[c]	Baseline	23,538	25,206	25,645	28,456
	Change		207	170	179
Expenditures ($1000)	Baseline	26,456	29,158	30,066	34,882
	Change		218	215	233
Change in Tax-burden on the Old Property Tax Base ($)[d]			33,678	-56,860	-78,434

[a] Projected future level without the addition of new swine enterprises.
[b] Projected change from the baseline with the addition of the swine enterprises.
[c] Revenues from income sources other than tax assessed on real and personal property.
[d] The change in the tax-burden that would be assessed against the original tax payers as a result of increasing the real and personal property tax-bases through the addition of the swine enterprises.

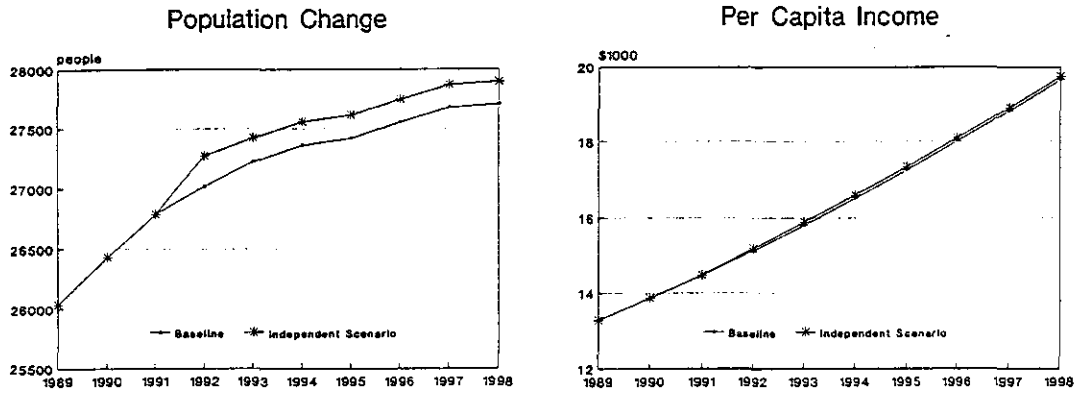


FIGURE 6. Results of the independent model: projected population and per capita income changes.

The swine enterprises increased retail sales almost $3 million in 1992 and over $1 million in each subsequent year (Figure 7). The real property tax-base was increased through the new economic activity by almost $6 million in 1992, $13 million in 1993, and $14 million in 1998. The personal property tax-base was also increased: $700,000 in 1992, $800,000 in 1993, and almost $900,000 in 1998. After accounting for the revenue from sources outside of personal and real property taxes and the expenditure from the increased demand for services, the tax burden on the old property tax base was reduced by $34,000 in 1992 and $78,000 in 1998. This was approximately $4 per tax bill, as in the contracting scenario.

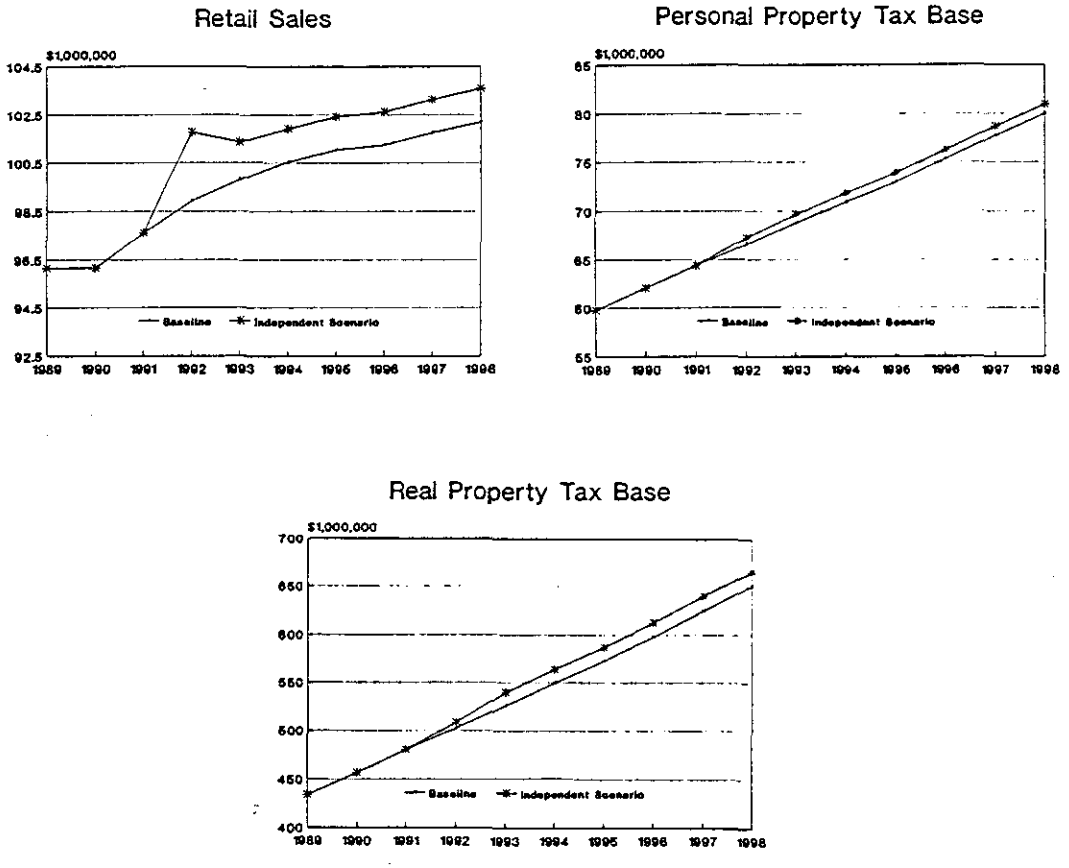


FIGURE 7. Results of the independent model: projected changes in retail sales, real property tax base, and personal property tax base.

14 COMPARISON of CONTRACTING and INDEPENDENT PRODUCTION RESULTS

Table 6 compares the county-level impacts from adding either contract or independent swine operations. During 1992, there were 114 construction jobs in both cases. Because the contract systems began operation in 1992, an additional 35 positions were added. The independent systems have a longer start-up period, but in 1993 all the swine systems were in full operation. The independent operations created a slightly larger number of permanent jobs, with 83 remaining during 1993, compared to 73 in the contract operations. In both cases the unemployment rate decreased by only a slight amount as the new positions were filled from a variety of sources: new entrants to the workforce, more people commuting into the county, fewer people commuting to other counties, and new county residents.

TABLE 6. Comparison of community impact from adding swine enterprises.

Type Size	Contract 5000 sows	Independent 5000 sows
Change in Employment		
1992[a]	149	114
1993[b]	73	83
Change in Unemployment Rate		
1992	-.13%	-.10%
1993	-.06%	-.07%
Change in Per Capita Income		
1992	$91.09	$65.41
1993	$55.01	$75.14
Change in Retail Sales(1000)		
1992	$2,957	$2,851
1993	$1,097	$1,312
Change in Real Property tax-base(1000)		
1992	$7,718	$5,771
1993	$12,881	$14,307
Change in Personal Property tax-base(1000)		
1992	$955	$719
1993	$2,337	$897
Change in the Tax-Burden on the old Tax Base		
1992	-$31,738	-$33,678
1993	-$85,385	-$78,434

[a] 1992 includes construction and 6 months of operation for contract production. It includes construction only for the independent production.
[b] 1993 includes full operation for both contract and independent production.

Per capita personal income rose in both cases. During 1992 the contract operations increased the level by $91 over the baseline compared to $65 per person for the independents. During 1993, once all units were in full production, the patterns reversed and the independent operations added $75 while the contract operations added $55.

The change in retail sales was very similar between the contract and independent operations. In both, a much larger impact occurred during the construction phase, when building materials were being purchased, than during the operation phase. Different reasons caused this to be true for the two scenarios. For the contracting operations, most of the supplies, especially feed, needed for the operations were supplied by the company from outside the county. The independent operations, on the other hand, did purchase a larger amount of their supplies within the county, but most of these purchases were for items that are exempt from the state sales tax.

The change in real property tax base followed the same trend as personal income, with the contract operations showing a larger impact during 1992 and the independent operations showing a larger impact during 1993. However, the impact on the personal property tax base by the contract operations was slightly larger during 1992 and much larger during 1993. This resulted from additional feed and livestock trucks that would be located in the county to serve only the contract operations. The independent producers were assumed to be purchasing these services from existing haulers, both inside and outside the county. As business increased for independent haulers, they purchased additional equipment. However, these were not direct purchases from the swine operations but additional sales created through the multiplier effects.

The final measure of community impact—the change in the tax burden on the old property-tax base—indicated relatively similar impacts from the additional swine enterprises whether the hogs were produced under contract or independently. The VIP models predicted that by 1998 the tax burden on the old tax base could decrease $85,000 from the addition of 5000 sows produced under contract and $78,000 from the addition of 5000 sows in independent operations. In either case, the reduction on each Halifax County real estate tax ticket was about $4.

CONCLUSIONS

Virginia has excellent potential for revitalizing and expanding its swine industry. A large market exists in the form of Smithfield Foods, Inc. Hogs have traditionally been produced in the state, so a base of knowledge and experience is available. Recently, the availability of contract production, in addition to the more traditional independent production, has increased opportunities. Individual producers without prior experience in swine production can still engage in a contract operation with help from the integrator's extensive management assistance. For the independent producer, county and area extension agents are available for help. When managed correctly, hogs can provide needed farm income as either full-time or part-time endeavors.

The addition of either contract or independent swine enterprises to a rural county will bring positive economic growth to the area. Although the *level* of impact will be roughly equivalent whether the expansion occurs through contract or independent operations, the *types* of effects will differ. As contract production increases, the integrator will create jobs directly within the company (for example, feed handling and animal transportation will occur as one part of the company's operations). In contrast, as independent production increases, farm operators will tend to hire individual services within the community (for example, feed, supplies, or transportation services will be purchased from local dealers, thereby increasing business and creating new positions through the multiplier effect). Regardless of how the increased activity occurs, however, employment, income, sales, and real and personal property tax-base levels will increase by approximately the same amounts. As the industry

expands within a county, contract and independent production both are likely to increase, with individual producers choosing the production system that best fits their needs.

The additional economic activity from the overall expansion (both contracting and independent) of the swine industry in Halifax County could add approximately 200 people to the population and 100 people to the labor force. Between 73 and 83 new jobs would be created. Approximately 30 positions would be on the farm with opportunities available for both full-time and part-time farmers. Since the finishing floors only require one hour of labor per day, it is likely that more than 30 farmers will be affected as individuals add units to existing farms or supplement off-farm jobs. Between 41 and 53 jobs would be created in either direct support industries (feed, transportation) or in other sectors as more dollars enter the economy. The county unemployment rate could drop by .065 percent, and some viability would be restored to an agricultural sector that has suffered heavy losses in employment.

The new positions could generate average incomes of approximately $14,000 for the construction positions, $23-42,000 for the on-farm positions, and $15-20,000 for the support positions in the community, compared to the average per capita income (in 1988) of $12,229 in Southside Virginia and $17,665 in the state overall (Center for Public Service). Except for the construction phase, these incomes are consistently higher than the area average and generally higher than the state average. The average on-farm income is more than twice the net farm earnings reported in a 1989 farm family survey (Stallmann and Pease).

A revitalization of the swine industry in a rural county would help restore jobs in the construction and agricultural sectors, and would lead to increased jobs in other sectors. These positions would have salary levels at or well above the county average and would lead to an increased county population and labor force. Fiscally, the county would see an increase in both the real and personal property tax bases. The retail sales would also increase, increasing the sales tax revenue to both the county and to the state.

APPENDICES

Halifax County covers 816 square miles (see the map in Figure 1). The county is bordered by North Carolina on the south and contains the independent city of South Boston within its boundaries. Two major highways bisect the county, and the Norfolk-Southern railroad runs both north/south and east/west across the county. Two large independent cities, Lynchburg and Roanoke, lie within 60 miles of the county lines. Historically, Halifax has produced about 1 percent of the hogs in Virginia.

Economic Indicators for Halifax County and the City of South Boston

Population: Population in Halifax has steadily grown both smaller and older since 1970. Between 1970 and 1990, the county lost 3.5 percent of its residents, although during the same period Virginia experienced a 33-percent population increase. In 1990, slightly over 29,000 people lived in Halifax County. The city of South Boston has increased the number of residents 1.6 percent since 1970 to a population of almost 7000 by 1990.

According to the 1992-93 *Virginia Statistical Abstract*, the population of the county is expected to increase after 1990 but at a very slow rate. South Boston is expected to maintain a population of 7000 residents. Virginia is expected to continue growing at a much higher rate due to increased growth in the more urban areas of Northern Virginia, Richmond, and Virginia Beach. Therefore, over time, Halifax will represent a much smaller portion of the Virginia population (Figure A-1).

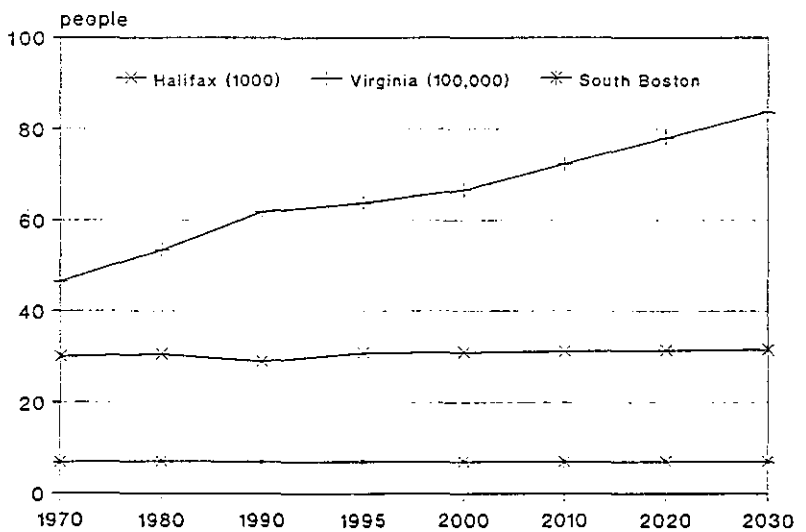
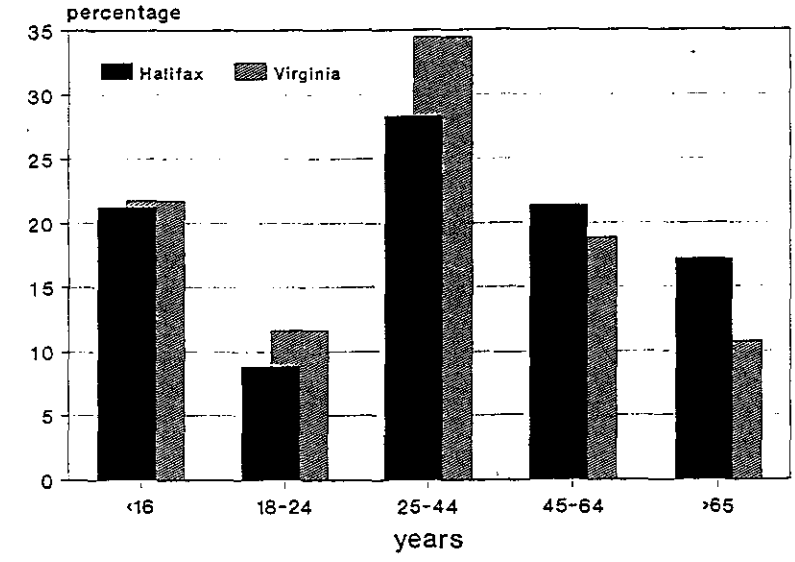


FIGURE A-1. Population (1970-1991) and population estimates (1995-2030) for Halifax County, the city of South Boston, and the state of Virginia.

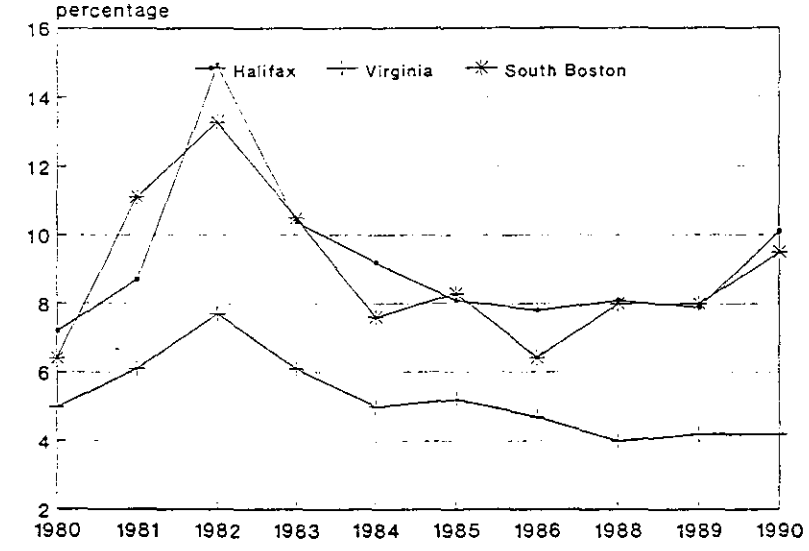
The population in the area is older than the state average (Figure A-2) and is aging at a faster rate. Between 1970 and 1990, the Virginia median age increased 5.8 years to 32.6, while the county median age increased 9.3 years to 36.9 and the city increased 6.5 years to 38.2. Twenty-eight percent of the population in Halifax and South Boston is between the ages of 25 and 44, and over 17 percent of the population is over age 65. In comparison, 35 percent of Virginia's population is between ages 25 and 44 and less than 11 percent is over age 65.



Source: U.S. Census

FIGURE A-2. 1990 age distribution among the population of Halifax County (including South Boston) and Virginia.

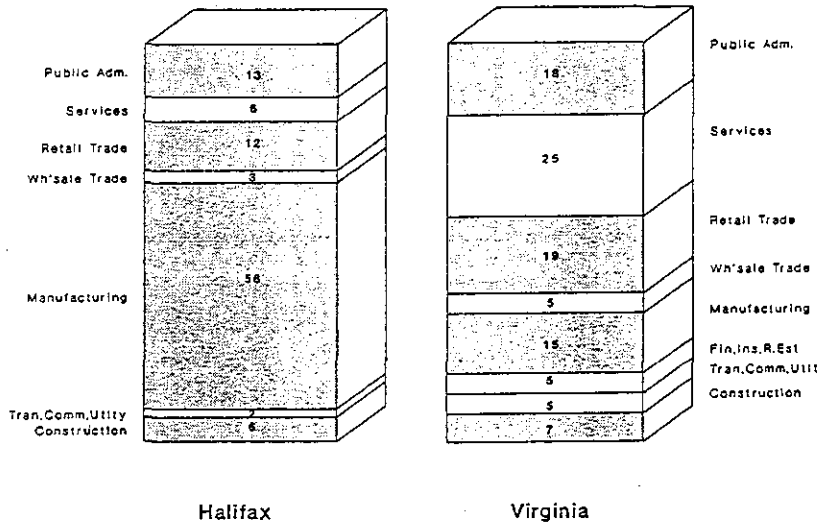
Employment: Unemployment in Halifax County has remained at least 2 percent greater than the state's average rate in every year since 1980. In times of rising overall unemployment, Halifax County rates tend to rise even faster and, at times, are more than double the state average (Figure A-3). In 1990, when the state unemployment rate was 4.2 percent, the county and city rates were 10.1 and 9.5 percent, respectively.



Source: Labor Market Review

FIGURE A-3. 1980-1990 unemployment rate for Halifax County, the city of South Boston, and the state of Virginia.

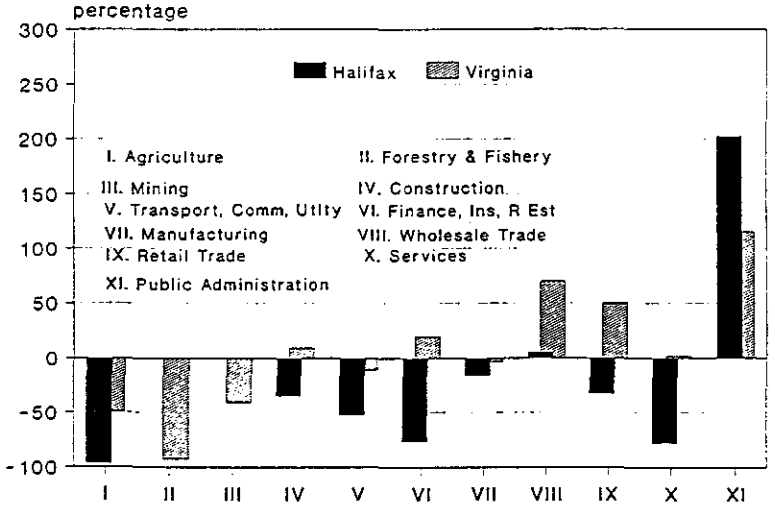
Employment opportunities are different in Southside than in the state as a whole (Figure A-4). Since 1980, the highest percentage of jobs in Virginia has been in service industries (approximately 25 percent) with less than 20 percent of jobs in the manufacturing sector. Halifax has been heavily dependent on the manufacturing sector for employment: Over one-half of all county jobs since 1984 have been in this sector. Less than 10 percent of jobs in Halifax are in the service industries. Although Halifax is largely a rural county, less than 1 percent of the jobs are in the agricultural sector.



Average Employment, 3rd quarter 1990
Source: Covered Employment and Wages in Virginia by 2-Digit SIC Industry

FIGURE A-4. Percentage distribution of employment among industries in Halifax County and Virginia.

Between 1980 and 1990, there was a decrease of over 4,000 total jobs available in the county. The only sectors with increasing job opportunities were public administration and wholesale trade, but these gains were more than offset by large losses in the services, agriculture, and manufacturing industries (Figure A-5). Throughout the state, the number of jobs increased substantially during the 1980s with strong gains in public administration and in wholesale and retail trade.



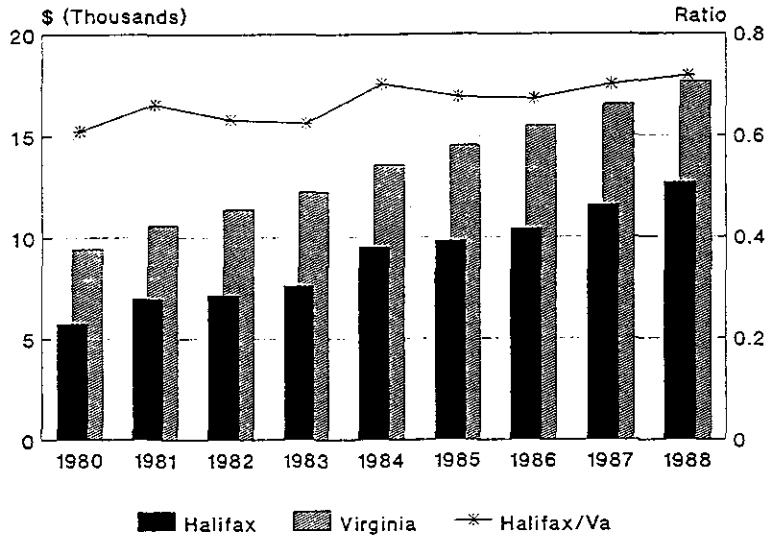
Source: Covered Employment and Wages in Virginia by 2-Digit SIC Industry

FIGURE A-5. Percentage change in the number of jobs among 11 industries in Halifax County and Virginia, 1980-1990.

Halifax and South Boston have made a strong effort to reverse the downward trend in employment numbers. Since the late 1980s, several new businesses have been attracted to the southside area by modest wage rates, a strong work ethic in the local work force, and readily available natural resources (Gerring). A $1.2-billion power plant, currently being constructed in the county, is expected to add 1250 jobs. Recognizing that agriculture is an

integral part of the area, the industrial development authority of Halifax has specifically targeted food-processing industries as potential investors in the region (Confroy).

Income: Although the growth rate in county per capita income was over 20 percent in some years during the 1980s, the level of income in Southside still remains well below the state average (Figure A-6). In 1988 the average per capita income in Virginia was $17,665; in Halifax and South Boston, it was $12,706. The ratio of local to state income has increased during the 1980s, however, indicating that some gains have been made in bringing Southside income levels up to the state average. The 1980 U.S. Census indicated that approximately 19 percent of the population in Halifax County lived below the poverty level, compared to slightly less than 12 percent throughout Virginia.



Source: Virginia Statistical Abstract

FIGURE A-6. Halifax County (including South Boston) and Virginia Per Capita Income, 1980-1988.

Agriculture: Agriculture remains an important component of the economy in Southside. In 1984, farm earnings made up 7.2 percent of the total earning in the area, compared to 0.7 percent for Virginia. Although the number of people employed in agriculture has decreased since 1980, the agricultural industries still provide a significant portion of the county income. The structure of agriculture has followed the national trend emerging in the 1990s of fewer and larger farms.

There were still more full-time than part-time farmers in the county in 1987, although the number of full-time farmers dropped substantially since 1974, while the number of part-time farmers has increased. In a 1989 survey of Virginia farm residents (Stallmann and Pease), 23 farm operators who responded were from Halifax County. Of these, eight were employed full-time in farming, five worked part-time off the farm, five worked full-time off the farm, and five were retired. The average total family income equalled $28,864. Net farm earnings equalled $10,788, or 37 percent of the total family income.

A diversity of agricultural enterprises exist within the region. In 1987, 1-2 percent of Virginia's beef cattle, swine, corn grain, soybean, and hay industries were located in Halifax. Three percent of the state's wheat acres and 15 percent of the tobacco acres were harvested in the county (Table A-1). Vegetable production, especially production of broccoli, has also increased in the region.

TABLE A-1. Agricultural enterprise size in Halifax County, 1987.

Item	Units	Halifax Production	Percentage of Va. Production
Tobacco	acres	6,746	14.90
Corn	acres	5,655	1.66
Soybeans	acres	5,028	1.09
Wheat	acres	5,112	2.71
Hay	acres	13,621	1.30
Hogs	head	3,616	1.05
Beef	head	10,067	1.73
Dairy	head	656	0.42
Sheep	head	223	0.14

Source: U.S. Department of Commerce, *1987 Census of Agriculture*.

Among the livestock enterprises, only the beef industry has grown in numbers since 1969 (Figure A-7). The dairy and hog industries have become considerably smaller, and sheep numbers have remained almost constant.

Among the grain crops, corn had the largest and most steady decline in acreage, as production fell by more than one-half since 1969. Wheat acreage showed substantial increases in the early 1980s, but by 1987, harvested acres were back to the 1970s levels. Soybean acreage has increased 350 percent since 1969, and Halifax has increased its share of state production to 1.1 percent. Tobacco acreage has decreased since 1969, but Halifax has maintained its share of the state production as acreage has dropped off in other areas as well. Hay crops have shown a fairly large increase in acres harvested, but the regional share of the state production has remained relatively constant.

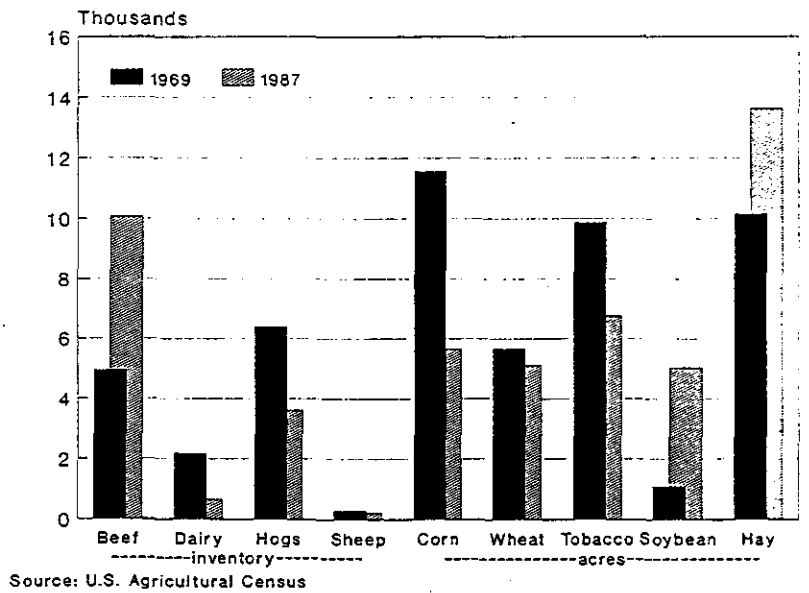


FIGURE A-7. Changing agricultural enterprise size in Halifax County, 1969-1987.

APPENDIX B
INPUT VALUES USED to CALCULATE ESTIMATED ANNUAL RETURNS for SWINE PRODUCTION CONTRACTS.

The source of this information is Carroll's Foods of Virginia, Inc.

Financial Performance for 720-head Contract Finishing Unit

CARROLL'S PROVIDES:

1. Feeder Pigs
2. Management Procedures and Standards
3. Feed, Medicines, Disinfectants, Veterinary Care
4. Records Keeping System
5. Live Haul to Processing Plant
6. Complete Feed System (7-year payback)

GROWER PROVIDES:

1. Facilities and Equipment
2. Repairs and Maintenance of Facilities and Equipment
3. Labor and Management
4. Utilities
5. Record Keeping

INVESTMENT:

Building(Turnkey)	$67,500
Lagoon and Site Work - 120,000ft^3	4,500
Land	0
Total	$72,000
Equipment provided by Carroll's	7,500
(Pro-rate pay-back if contract is terminated before 7-years)	
Total	$64,500

PERFORMANCE:

Pigs Placed	720	head
Weight of Feeder Pigs	50	lbs
Total Weight Placed	36,000	lbs
Liveability	98	%
Pigs Sold	706	head
Weight of Pigs Sold	235	lbs
Total Weight Sold	165,910	lbs
Feed Conversion - Deads included	2.8	feed/gain
Feed Consumed	373,748	lbs
Total Gain	129,910	lbs

REVENUES:

Total Weight Gain	129,920	lbs
Weight Gain Contract Fee	$0.03	cents/lb
Total Weight Gain Payment	$3,897.30	
Base Feed Conversion	400	feed/gain
Feed Conversion Achieved	280	feed/gain
Conversion Bonus Performance	120	feed/gain
Conversion Bonus Fee	$0.03	$/conversion bonus
Conversion Payment per Head	$3.60	$/head
Head Sold	706	head
Total Conversion Bonus	$2,541.60	
Total Contract Payment Per Group	$6,438.90	
Groups per year	2.88	
Total Annual Revenue	$18,544.03	

EXPENSES:

Utilities	$1,500
Repairs and Supplies	1,000
Property Taxes	480
Insurance	325
Total Cash Expenses Before Labor	$3,305
Gross Profit Before Labor and Debt Service	$15,239
Estimated loan payment, 100% financing	
10 year, fixed payment loan at 10%	$10,492

RETURNS:

Net Annual Returns (year 1-10)	$4,747
Hourly returns	
1.0 hour of labor per day	13.01
1.5 hours of labor per day	8.67
2.0 hours of labor per day	6.50
Net Annual Returns (year 11-15)	$15,239
Hourly returns	
1.0 hour of labor per day	41.75
1.5 hours of labor per day	27.83
2.0 hours of labor per day	20.88

CARROLL'S PROVIDES:

1. Breeding Herd and Replacements
2. Management Procedures and Standards
3. Feed, Medicines, Disinfectants, Veterinary Care
4. Records Keeping System
5. Pick-Up

GROWER PROVIDES:

1. Facilities and Equipment
2. Repairs and Maintenance of Facilities and Equipment
3. Labor and Management
4. Utilities
5. Record Keeping

INVESTMENT:

Building (Breeding-Gestation-Farrowing-Nursery-Office)	$470,000
Lagoon	40,000
Land	0
Total	$510,000

PERFORMANCE:

Base Pay - Paid Monthly - $14.75 per pig moved during prior month

Incentive Payment - Paid Quarterly - An incentive based on market pigs per sow er year based on the following table.

PRODUCTION INCENTIVE PROGRAM:

On or before the fourteenth day following the end of each fiscal quarter, as herein defined, Carroll's shall pay to grower a production incentive payment equal to (1) the number of acceptable feeder pigs picked up per year per sow for the quarter just ended, as such sum is defined in paragraph 6(A)(IV) hereof, multiplied by (2) the applicable production incentive payment as hereinafter set forth:

Market Pigs Per Sow Per Year	Production Incentive Payment Per Pig
Less than 16.49	.00
16.50 - 16.99	.25
17.00 - 17.49	.50
17.50 - 17.99	.75
18.00 - 18.49	1.00
18.50 - 18.99	1.25
19.00 - 19.49	1.50
19.50 - 19.99	1.75
20.00 - 20.49	2.00
20.50 - 20.99	2.25
21.00 - 21.49	2.50
21.50 - 21.99	2.75
22.00 - 22.49	3.00

For every one-half (.50) pig per sow per year over 22.49 the production incentive would be increased twenty-five cents (.25)

CONTRACT PAYMENT PER PIG:

Base Payment	$14.75	per pig
Incentive Payment	1.75	(19.76 mkt pigs per sow per year)
Total Payment	$16.50	per pig

PRODUCTION:

Twenty-four (24) farrowing	220	at 9.167 per crate
	52	farrowing per year
	11,440	pigs per year

GROSS ANNUAL REVENUE:

	11,400	pigs
	16.50	per pig
	$188,760	$/year

EXPENSES:

Utilities	$21,000
Repairs and Maintenance	7,200
Property Taxes	2,750
Insurance	1,900
Total before labor and debt service	32,850
Labor expense (average 50 hours per week)	
Manager	$30,000
Employee 1	20,000
Employee 2	16,000
Total labor expense	66,000
Estimated debt service, 100% financing 10 year, 10.75% fixed payment loan	85,502

RETURNS:

Net Annual Returns (year 1-10)	4,408
plus manager's salary	30,000
	34,408
Net Annual Returns (year 11-15)	89,910
plus manager's salary	30,000
	119,910

Financial Performance for 1000-sow Contract Feeder Pig Facility

CARROLL'S PROVIDES:

1. Breeding Herd and Replacements
2. Management Procedures and Standards
3. Feed, Medicines, Disinfectants, Veterinary Care
4. Records Keeping System
5. Pick-Up

GROWER PROVIDES:

1. Facilities and Equipment
2. Repairs and Maintenance of Facilities and Equipment
3. Labor and Management
4. Utilities
5. Record Keeping

INVESTMENT:

Building (Breeding-Gestation-Farrowing-Nursery-Office)	$774,200
Lagoon	60,000
Land	0
Total	$834,200

PERFORMANCE:

Base Pay - Paid Monthly - $14.75 per pig moved during prior month

Incentive Payment - Paid Quarterly - An incentive based on market pigs per sow per year based on the following table.

PRODUCTION INCENTIVE PROGRAM:

On or before the fourteenth day following the end of each fiscal quarter, as herein defined, Carroll's shall pay to grower a production incentive payment equal to (1) the number of acceptable feeder pigs picked up per year per sow for the quarter just ended, as such sum is defined in paragraph 6(A)(IV) hereof, multiplied by (2) the applicable production incentive payment as hereinafter set forth:

Market Pigs Per Sow Per Year	Production Incentive Payment Per Pig
Less than 16.49	.00
16.50 - 16.99	.25
17.00 - 17.49	.50
17.50 - 17.99	.75
18.00 - 18.49	1.00
18.50 - 18.99	1.25
19.00 - 19.49	1.50
19.50 - 19.99	1.75
20.00 - 20.49	2.00
20.50 - 20.99	2.25
21.00 - 21.49	2.50
21.50 - 21.99	2.75
22.00 - 22.49	3.00

For every one-half (.50) pig per sow per year over 22.49 the production incentive would be increased twenty-five cents (.25)

CONTRACT PAYMENT PER PIG:

Base Payment	$14.75	per pig
Incentive Payment	1.75	(19.76 mkt pigs per sow per year)
Total Payment	$16.50	per pig

PRODUCTION:

Forty (40) farrowing at 9.125 per crate	365	pigs per farrowing
	52	farrowing per year
	18,980	pigs per year

GROSS ANNUAL REVENUE:

	18,980	pigs
	16.50	per pig
	$313,170	$/year

EXPENSES:

Utilities	$35,000	
Repairs and Maintenance	12,000	
Property Taxes	5,500	**Price**
Insurance	3,800	
Total before labor and debt service	56,3000	
Labor expense (average 50 hours per week)		
Manager	$30,000	
Employee 1	20,000	
Employee 2	16,000	
Employee 3	13,000	
Employee 4	13,000	
Total labor expense	94,000	
Estimated debt service, 100% financing 10 year, 10.75% fixed payment loan	140,168	

RETURNS:

Net Annual Returns (year 1-10)	22,702	
plus manager's salary	30,000	
	52,702	
Net Annual Returns (year 11-15)	162,870	
plus manager's salary	30,000	
	192,870	

APPENDIX C
INPUT VALUES USED to CALCULATE HISTORICAL ANNUAL RETURNS to an INDEPENDENT 500-SOW FARROW-to-FINISH OPERATION.

INVESTMENT:

Building and Equipment	$1650 per sow * 500 sows	$825,000
Land		0
Total		$825,000

10% financing on building and equipment plus an additional $326,500 borrowed to cover start-up costs.

PERFORMANCE:

9 pigs weaned per litter
2.08 litters per sow per year
3.85 whole herd feed conversion
$1.50/cwt. market hog price premium
Farmville corn price plus $0.25/bu. margin

TABLE C-1. Annual prices and returns used in the independent-operation scenario[a].

Date	Price			Gross Income	Feed Costs	Debt Service	Net Returns
	Mkt Hogs[b]	Corn[c]	SBM[d]				
	$ per cwt	$ per bu	$ per ton	$ per year	$ per year	$ per year	$ per year
1977	41.60	2.60	270	929,595	604,662	189,598	-14,735
1978	49.10	2.71	242	1,098,158	592,835	189,598	162,854
1979	43.65	2.96	272	975,669	646,806	189,598	-23,087
1980	41.17	3.41	283	919,942	707,016	189,598	-150,932
1981	45.32	3.49	301	1,013,206	731,756	189,598	-92,451
1982	56.19	2.76	249	1,257,493	604,836	189,598	290,146
1983	48.09	3.80	227	1,075,451	703,893	189,598	13,412
1984	49.79	3.80	193	1,113,663	674,733	189,598	77,845
1985	45.92	3.11	143	1,026,694	553,505	189,598	122,898
1986	51.81	2.62	179	1,159,061	529,281	189,598	281,792
1987	51.99	2.21	203	1,163,104	503,136	0[e]	501,414
1988	43.74	2.92	251	977,694	624,917	0	189,820
1989	44.02	3.05	233	983,988	624,044	0	192,323
1990	55.15	3.04	192	1,234,119	587,789	0	484,763
1991	50.37	2.96	195	1,126,701	581,196	0	392,498
avg year	47.86	3.03	229	1,070,291	618,101	189,598	98,938
1-10 year	47.26	3.13	236	1,056,893	634,932	189,598	66,774
11-15	49.05	2.84	215	1,097,121	584,216	0	352,164

Source: Thornsbury and Kenyon, *Virginia Simulated Hog Returns 1977-1988: Growing Versus Buying Corn.*

[a] This scenario assumes a well-managed, 500-sow, farrow-to-finish operation.
[b] Market hog price equals the quoted Smithfield, Virginia, price plus $1.50 per cwt premium for uniform, truck-load lots.
[c] Corn price equals the Farmville, Virginia, price plus a margin of $0.25 per bushel.
[d] Soybean meal price equals the quoted price for meal delivered to Virginia locations.
[e] All debts have been paid after 1987.

Table C-2. Annual budget using 1977-1991 average costs.

	Unit	Quantity	Price	Value per Herd
Income:				
Market hogs	head	9073	$47.86	$1,024,769
Cull sows	head	190	41.15	33,229
Non-breeders	head	80	43.86	10,526
Boars	head	12	36.15	1,767
GROSS INCOME				1,070,291
Direct Costs:				
Corn	bu.	113207	$3.03	343,018
Soybean meal	ton	856	229.00	195,819
Purchased feed	cwt.	5011	15.82	79,264
Total Feed				618,101
Vet/Medicine	$/sow/year	21	—	10,500
Fuel,electricity	$/sow/year	66	—	33,000
Equipment repair	$/sow/year	12	—	6,000
Boar purchase	head	12	400.00	4,600
Gilt purchase	head	100	150.00	15,000
Miscellaneous	$/sow/year	9	—	4,500
Hired labor	hour	3900	7.00	27,300
Marketing	cwt.	21412	1.00	21,412
Operating interest	%	.115	—	41,343
TOTAL DIRECT COSTS				781,755

	Investment	Rate	Value per Herd
Debt Service:			
Building and Equipment	825,000	.10	134,265
Start-up Costs	340,000	.1	55,333
TOTAL DEBT SERVICE			189,598
RETURNS OVER DIRECT COSTS			288,536
RETURNS OVER ALL COSTS			98,938

REFERENCES

Center for Public Service. *Virginia Statistical Abstract.* University of Virginia, Charlottesville, 1992-93.

Confroy, William E. Executive Director, Industrial Development Authority of Halifax County, telephone conversation, August 24, 1992.

Gerring, Jane. "Counting the Costs." *Virginia Business*, July 1992, pp. 34-40.

Stallmann, Judith I. and James W. Pease. "Virginia Farm Family Survey for 1988." Department of Agricultural Economics, Virginia Tech, 1989 (unpublished).

Thornsbury, Suzanne and David Kenyon. *Virginia Simulated Hog Returns 1977-1988: Growing Versus Buying Corn.* Virginia Agricultural Experiment Station Bulletin 90-1, Virginia Tech, April 1990.

U.S. Department of Commerce, Bureau of the Census. *Census of Agriculture.* Washington D.C., 1969, 1982, 1987.

_____. *Census of the Population*, Washington D.C., 1990.

Virginia Employment Commission. *Covered Employment and Wages in Virginia by 2-Digit SIC Industry.* Richmond, various quarterly issues.

_____. *Labor Market Review.* Richmond, various monthly issues.

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1993 Publication 448-211 / REAP R012

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