

Sea Island Bank Alternative Growth Scenarios

ALTERNATIVE PATHS FOR ECONOMIC DEVELOPMENT: SIMULATIONS 2006, 2015 AND 2025

Introduction

The Sea Island Bank has requested forecasts of population and income for coastal Georgia under alternative growth scenarios. The goal is to draw a picture of the economy for total growth on the same scale as that which would have resulted from the attraction of Daimler-Chrysler to Savannah. This requires growth scenarios that will produce approximately 5,000 new jobs. This report presents the forecasts for 2006, 2015, and 2025 for the Savannah MSA divided into two sub-regions: 1) a five county sub-region that includes Bryan, Chatham, Effingham, Liberty and Screven counties, referred to hereafter as the Savannah Area, Georgia Counties; and, 2) a three county sub-region referred to hereafter as the Savannah Area, South Carolina Counties that includes Beaufort, Hampton and Jasper counties.

The forecasts were prepared using the regional economic modeling system REMI.¹ The models for the sub-regional MSAs were built for the Bureau of Business Research and Economic Development. The dynamic modeling system fully incorporates the conversion to the new industrial classification system, NAICS, which replaced the old SIC code system.² The regional models were built from the 70-sector, Version 6 REMI model. The model version has been updated since the previous report for Sea Island Bank. For comparisons purposes, this report has included data for 2005 to isolate the differences from the previous report.

This paper will not repeat the description of the REMI model contained in the previous report. The description has, however for convenience, been placed in an appendix. The following explains the two growth scenarios that were developed to simulate an alternative development option to that of attracting a large auto manufacturer. This is followed by a discussion of the economic outcomes of the simulations in terms of forecasts of employment by sector, gross regional output, real income, population by age cohort and other demographic variables.

The Alternatives

It was felt that alternative growth scenarios should represent viable alternative strategies for regional economic development. The first scenario represents the most fundamental of economic development strategies; improve the region's goods and services by improving the quality of the region's workforce and/or shrink the region's distance from markets by investing in transportation and communications efficiencies. Improvements in the quality of the region's goods and services or expansion in the scale of the market, increases overall demand for the region's goods and services.

¹ REMI is a product of REMI, Inc. of Amhurst, MA.

² NAICS is the North American Industrial Classification System.

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The second scenario is based on the assumption that the region has certain competitive advantages due to a particular combination of factors that result in economies of agglomeration.³ To construct this scenario, location quotients for the Savannah MSA relative to the U.S. and location quotients for the Jacksonville, Florida MSA relative to the U.S. were constructed and compared. The Jacksonville MSA is approximately twice the size of the Savannah MSA and has the same key economic development amenities: a deepwater port; proximity to north-south and west inter-state highways; an international airport; several significant institutions of higher education; and, a prominent military presence. Tables 1 and 2 show the location quotients for the Jacksonville and Savannah MSAs, respectively. The shaded areas highlight the sectors in which Jacksonville is more concentrated than Savannah. Otherwise, the structures of the economies are remarkably similar, except, interestingly, Savannah is much stronger in manufacturing. In order to move the Savannah MSA economy closer to looking like the Jacksonville MSA economy, jobs were created in the following four key sectors in REMI: Manufacturing (Chemical, Printing, and Publishing); Wholesale Trade; Finance, Insurance and Investment; and Service (Management), as shown in Table 3.

TABLE 1
Location Quotient - Savannah

	1980	1990	2000	2010	2020
Farm Employment	0.24	0.15	0.14	0.13	0.10
Agricultural Services, other	0.90	0.66	0.66	0.61	0.56
Mining	0.06	0.07	0.13	0.13	0.13
Construction	1.25	1.78	1.19	1.11	1.00
Manufacturing	0.84	0.90	0.88	0.82	0.73
Transport, Comm. & Public Util	1.86	1.62	1.33	1.32	1.20
Wholesale Trade	0.89	0.86	0.83	0.84	0.80
Retail Trade	1.10	1.12	1.19	1.26	1.32
Fire, Ins. & Real Estate Services	0.88	0.69	0.68	0.65	0.58
Federal Civilian Govt	0.91	0.89	0.95	0.94	0.85
Federal Military Govt	1.95	1.79	2.48	2.54	2.35
State & Local Govt	1.03	0.93	0.94	0.94	0.92

TABLE 2
Location Quotient - Jacksonville

	1980	1990	2000	2010	2020
Farm Employment	0.25	0.21	0.20	0.18	0.18
Agricultural Services, other	0.99	1.01	0.88	0.82	0.80
Mining	0.16	0.27	0.28	0.26	0.26
Construction	1.05	1.20	1.04	0.99	0.96
Manufacturing	0.50	0.48	0.50	0.47	0.45
Transport, Comm. & Public Util	1.39	1.30	1.32	1.25	1.20
Wholesale Trade	1.26	1.09	1.06	1.04	1.02
Retail Trade	1.01	1.06	1.05	1.05	1.05
Fire, Ins. & Real Estate Services	1.36	1.36	1.46	1.41	1.41
Federal Civilian Govt	1.43	1.47	1.42	1.36	1.27
Federal Military Govt	3.79	3.69	2.71	2.68	2.62
State & Local Govt	0.91	0.78	0.65	0.61	0.61

TABLE 3
Sectors

*Manufacturing
Wholesale trade
Finance, Insurance and Investment
**Services
*Manufacturing includes Chemical, Printing, and Publishing.
**Services only includes the management of services.

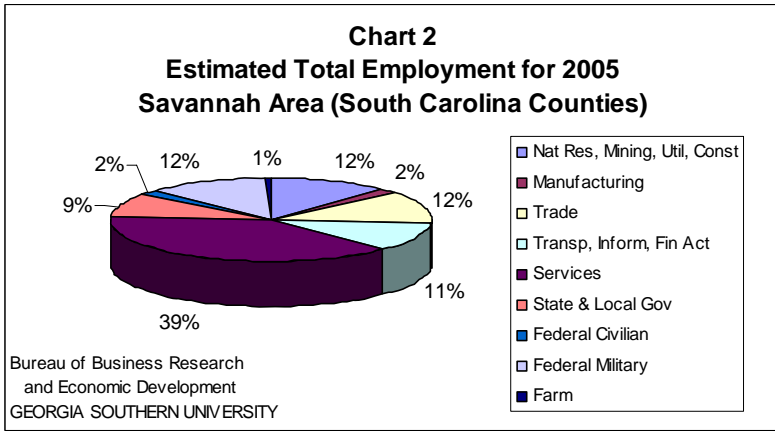
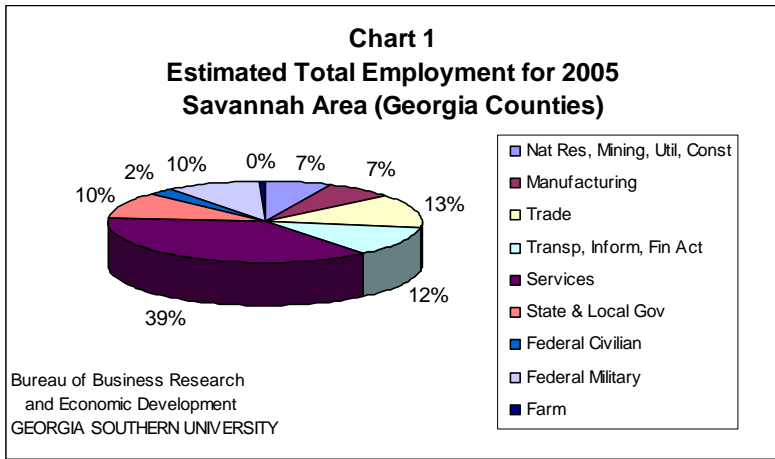
³ Agglomeration economies are cost savings or productivity gains in an economic activity that result from enterprises of activities locating near one another. These arise as a result of the external economies, benefits conferred by the actions of one firm that spillover to other firms.

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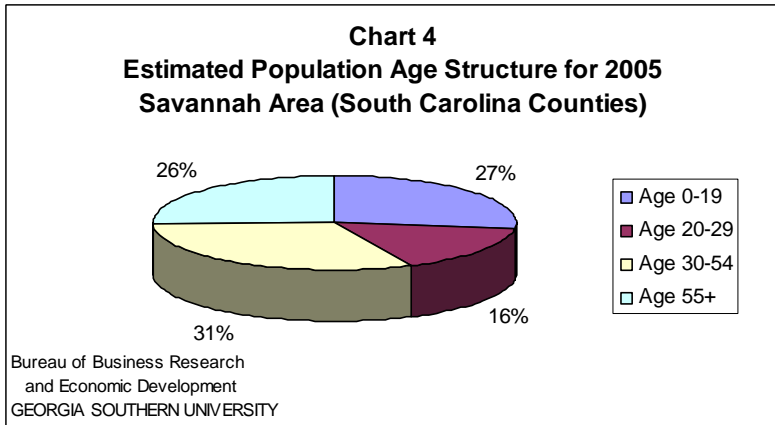
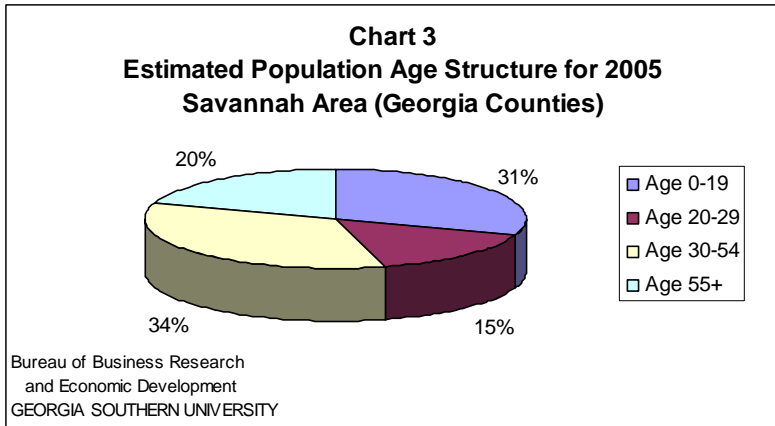
The Basic Economic Structure

All impact analyses in REMI are calculated and presented as adjustments or changes to the baseline forecast for the economy. Since the models have been updated since the previous Sea Island Bank report, the baseline for the economy is shown here as the starting point for the simulations of the alternative growth scenarios.

Charts 1 and 2, show the distribution of employment by sector for both the South Carolina Counties and Georgia Counties in the Savannah Area. Charts 3 and 4, looks at the population distribution for both areas. The updated version of the model compared to the previous report does not show any substantial difference in the base economy. Both MSAs have high service sector employment, consistent with their position as a regional service center. Both have high employment in Transportation, Information and Finance as well as in military employment. The Savannah counties are much more concentrated in manufacturing than the South Carolina counties.



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With respect to population, as with the previous Sea Island Bank report, the South Carolina counties have a much higher percentage of the population in the age group of 55 plus. This is due to the large retirement/second home population living in the Hilton Head area. The Savannah counties have more population in the prime working ages and more in the school age groups than the South Carolina counties.

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Economic Impact of Alternative Growth Scenarios

In this section we explore the differences in the economy produced by the alternative growth scenarios. The comparison is made on the basis of the impact on output, personal income, and value of residential and business capital stock.

Scenario One

The first growth scenario asks, what if the region's economy undergoes *no structural* change like the introduction of a new and very different type of major manufacturer, but is simply able to sell more goods and services to all consumers outside of the region. This amounts to a shift in aggregate demand for the region's goods and services. From a policy point of view, this might be accomplished by a combination of: 1) improvements in workforce productivity resulting in added value for the region's goods; and/or, 2) improvements in the region's infrastructure that lowers the cost of transportation and extends the reach of the market.⁴

To create 5,000 jobs with this first scenario, growth for the demand of all of the region's goods and services was increased over the base by 2.1% for each sector. Table 4 shows the employment increase over time for the entire Savannah Area. The designation in the table BF means the baseline forecast. This is the REMI forecast for the region assuming no change in the structure of the region's economy and no change in its fundamental competitiveness relative to all other regions. The highlighted lines show the impact, the growth above the base, associated with an increase of 2.1% in the aggregate demand for the region's goods and services. For example, because the largest sector currently in the Savannah Area is the Service sector at 41%, employment in Services increases by the most in absolute terms. In 2006, there is an increase of 2,239 jobs and by 2025 there are 2,792 jobs.⁵ Transportation, Trade and Construction follow with employment increases of between 800 down to 500 per period over base growth. There is only moderate growth in manufacturing above its base.

⁴The policies described are under the control of the region, but some sources of the shift in aggregate demand may also be exogenous, the result of forces outside the region. Exogenous shifts in aggregate demand include government decisions to increase the presence of the military in the region or to place other government facilities in the region. The destruction and degradation of basic infrastructure at the Port of New Orleans, the road infrastructure and other infrastructure necessary for efficient logistics is another source of an increase in aggregate demand for the region's goods and services.

⁵ It should be noted that this study did not increase farm demand due to the nature of that industry.

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TABLE 4
Scenario One - Employment Impact

	2006	2010	2015	2020	2025
BF Nat Res, Mining, Util, Const	28,468	29,544	31,421	32,215	32,563
Chg in Nat Res, Mining, Util, Const	551	738	713	687	679
BF Manufacturing	17,747	16,834	15,945	15,911	15,951
Chg in Manufacturing	281	251	226	229	236
BF Trade	43,588	44,571	43,935	41,777	39,608
Chg in Trade	848	887	872	844	817
BF Transp, Inform, Fin Act	38,196	39,778	41,218	41,851	42,438
Chg in Transp, Inform, Fin Act	634	648	654	670	690
BF Services	126,077	134,891	143,976	149,177	154,095
Chg in Services	2,239	2,335	2,463	2,616	2,792
BF Government	76,539	79,990	83,734	84,893	85,530
Chg in Government	56	219	336	394	422
BF Farm	1,664	1,589	1,483	1,351	1,228
Chg in Farm	-	-	-	-	-
Total Base Forecast	332,279	347,197	361,712	367,175	371,413
Total Changes	4,609	5,078	5,264	5,440	5,636

*Numbers may not add up due to rounding.

Shown in Table 5 for 2006 to 2025, are other impacts associated with the increase growth of 2.1%. The increases in output associated with selling more of the region's goods and services amounts to between, approximately, one-half billion and three-quarters of a billion in new sales. The growth adds to the region's population by increasing economic migration to the region. Without the additional growth, economic migration is negative, indicating that people are leaving the region because of a perception that job opportunities are low. The up-tick in economic migration occurs particularly in the early years of the growth and is replaced in later years with greater natural population growth. By 2025, the baseline shows the population staying at 674,956, due to the economic expansion adding 7,420 people in that year. Table 6 shows that the impact of the growth on the future population comes more from the younger age cohorts.

TABLE 5
Scenario One - Summary Forecast for Savannah

	2006	2015	2025
BF Output in Billions (Bil 2000\$)	27.474	34.635	40.646
Chg in Output in Billions (Bil 2000\$)	0.470	0.601	0.724
BF Employment	332,280	361,712	371,412
Chg in Employment	4,610	5,265	5,635
BF Population	571,929	626,086	674,956
Chg in Population	947	5,643	7,420
BF Economic Migrants	(841)	(28)	(1,557)
Chg in Economic Migrants	935	200	19
BF Total Real Disposable Income (Bil 2000\$)	14.746	18.419	21.998
Chg in Total Real Disposable Income (Bil 2000\$)	0.099	0.169	0.220

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TABLE 6
Scenario One - Age

	2006	2015	2025
BF Age 0-19	167,872	185,998	203,449
Chg in Age 0-19	295	1,927	2,573
BF Age 20-29	88,969	84,646	85,322
Chg in Age 20-29	285	993	861
BF Age 30-54	188,599	196,008	197,454
Chg in Age 30-54	320	2,271	2,971
BF Age 55+	126,490	159,433	188,731
Chg in Age 55+	48	452	1,015

This new growth stimulates both business and residential capital stock. By 2025, actual residential capital stock increases by \$405 million and actual business capital stock increases by \$330 million.

TABLE 7
Scenario One - Capital Stock (Bil 2000\$)
Residential

	2006	2015	2025
BF Act Capital Stock	24.058	35.11	47.461
Chg in Act Capital Stock	0.011	0.217	0.405
BF Opt Capital Stock	37.131	50.788	63.401
Chg in Opt Capital Stock	0.235	0.441	0.597
Business			
	2006	2015	2025
BF Act Capital Stock	13.551	17.566	22.538
Chg in Act Capital Stock	0.014	0.204	0.330
BF Opt Capital Stock	23.312	29.371	36.181
Chg in Opt Capital Stock	0.397	0.474	0.567

Scenario Two

Scenario Two amounts to the question, what if the region grows by attracting those industries to locate in the region that have the greatest advantage from a cost and productivity perspective? In the process, the region's economy undergoes some structural change causing it to move toward an economy that looks more like the Jacksonville, MSA.

Scenario Two is of greatest interest for its contrast to Scenario One. By employing a target strategy that would bring industries for which the region is highly competitive, the same 5,000 jobs have a very different impact. This is shown not only in jobs, but also in the other economic variables. For example, the increase in output over the base forecast, shown in Table 9, is more

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than twice as large under the previous scenario, and the impact on total personal income is also significantly higher. Net economic migration is smaller than the previous scenario because the region becomes more capital intensive and less labor intensive. Note that the increase in labor for the Services sector is much lower in this scenario. Additionally, job gains in the manufacturing sector are about three times larger than in the previous scenario. Residential and business capital stocks also grow, but only slightly more than in the previous scenario.

TABLE 8
Scenario Two - Employment Impact

	2006	2010	2015	2020	2025
BF Nat Res, Mining, Util, Const	28,468	29,544	31,421	32,215	32,563
Chg in Nat Res, Mining, Util, Const	314	508	415	360	340
BF Manufacturing	17,747	16,834	15,945	15,911	15,951
Chg in Manufacturing	669	614	601	644	691
BF Trade	43,588	44,571	43,935	41,777	39,608
Chg in Trade	968	955	885	834	795
BF Transp, Inform, Fin Act	38,196	39,778	41,218	41,851	42,438
Chg in Transp, Inform, Fin Act	1,321	1,270	1,234	1,240	1,264
BF Services	126,077	134,891	143,976	149,177	154,095
Chg in Services	1,776	1,696	1,625	1,653	1,715
BF Government	76,539	79,990	83,734	84,893	85,530
Chg in Government	46	171	244	270	277
BF Farm	1,664	1,589	1,483	1,351	1,228
Chg in Farm	-	-	-	-	-
Total Base Forecast	332,279	347,197	361,712	367,175	371,413
Total Changes	5,095	5,214	5,004	5,001	5,082

TABLE 9
Scenario Two - Summary Forecast for Savannah

	2006	2015	2025
BF Output in Billions (Bil 2000\$)	27.474	34.635	40.646
Chg in Output in Billions (Bil 2000\$)	0.802	0.950	1.143
BF Employment	332,280	361,712	371,412
Chg in Employment	5,095	5,004	5,082
BF Population	571,929	626,086	674,956
Chg in Population	781	4,081	4,857
BF Economic Migrants	(841)	(28)	(1,557)
Chg in Economic Migrants	771	96	(20)
BF Total Real Disposable Income (Bil 2000\$)	14.746	18.419	21.998
Chg in Total Real Disposable Income (Bil 2000\$)	0.140	0.187	0.221

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TABLE 10
Scenario Two - Age

	2006	2015	2025
BF Age 0-19	167,872	185,998	203,449
Chg in Age 0-19	243	1,401	1,683
BF Age 20-29	88,969	84,646	85,322
Chg in Age 20-29	235	687	529
BF Age 30-54	188,599	196,008	197,454
Chg in Age 30-54	264	1,659	1,938
BF Age 55+	126,490	159,433	188,731
Chag in Age 55+	40	334	706

TABLE 11
Scenario Two - Capital Stock (Bil 2000\$)
Residential

	2006	2015	2025
BF Act Capital Stock	24.058	35.11	47.461
Chg in Act Capital Stock	0.015	0.251	0.417
BF Opt Capital Stock	37.131	50.788	63.401
Chag in Opt Capital Stock	0.319	0.471	0.581
Business			
	2006	2015	2025
BF Act Capital Stock	13.551	17.566	22.538
Chg in Act Capital Stock	0.018	0.258	0.417
BF Opt Capital Stock	23.312	29.371	36.181
Chag in Opt Capital Stock	0.518	0.593	0.726

Conclusions

The pattern of growth in Scenario One illustrates the path for the region's economy under the assumption that the region does not undergo any basic structural change in the economy. The region is assumed to simply sell more of what it already produces. From a policy perspective, this higher rate of growth can be achieved by policies that increase workforce productivity and/or by investments in infrastructure that reduce the cost of transporting the goods and services produced. To some extent this scenario may also represent the impact of losses in essential port and transportation infrastructure that occurred due to hurricanes Katrina and Rita.

Scenario Two addresses the question of what if the region seeks out manufacturing firms and encourages growth in specialized areas such as management services for which the region has a comparative advantage. Overall, job growth is the same as Scenario One, but the region is wealthier.

APPENDIX

The REMI Model

REMI is a dynamic regional economic modeling system. There are three important attributes of REMI which make it a preferred means of forecasting economic and population growth. First, it models market behaviors. Second, it includes measures based on the New Economic Geography⁶ that captures the forces of agglomeration. Third, the model is a policy analysis model designed to allow one to examine the potential impacts of changes in economic development conditions.

- ***REMI Models Market Behaviors***

Methodologically REMI is a macroeconomic modeling system for small open economies which recognizes that regional open economies do not share all of the policy parameters or barriers to factor mobility that small open national economies face. The focus of the model is on the interactions between the regions of interest, in this case the coastal region of Georgia, and all other regions, national and global. However, unlike counterpart models of small open economies in an international framework, the free movement between regions of goods, services, capital, labor and population is assumed. It is an important aspect of the model that labor moves in response to changes in economic conditions that makes REMI particularly powerful for forecasting changes in population.

REMI's regional modeling system is built on market behaviors. Firms make decisions about what and where to produce goods and services based on relative wages, prices, profits, and amenities. Households make decisions about where to live and work based on the net demand for labor, relative wages, relative prices and amenities. Based on the movement of jobs and capital, labor moves between regions. Movement between regions results in changes in the market shares of regions, changes in gross regional output, changes in residential housing and changes in business capital stock. Increases in population and deepening regional economy results in increases in economies of agglomeration. All of these changes in economic conditions result in changes in relative prices and wages. The result is that forecasts are not totally dependent on past trends, but rather are dependent on a region's expected relative competitiveness.

- ***REMI Models New Economic Geography Forces***

New Economic Geography adds the dimension that there are powerful forces which tend to create and sustain growth in clusters of centralized development. Typically classified

⁶See Paul Krugman: *Development, Geography and Economic Theory*; *Geography and Trade*; and, *The Spatial Economy* (with Masahisa Fujita and Anthony Venables).

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as economies of agglomeration, the New Economic Geography components of the REMI model captures the forces of agglomeration on the relative costs of labor, the relative costs of other supplier inputs, and the relative costs of transportation. To give an example of a cluster, the Silicone Valley is a self-sustaining cluster of economic growth in high-technology. On the surface, the costs of doing business and the costs of living in the area appear prohibitively high for attracting new firms. However, because of the very high productivity of labor created by the effect of pooling highly specialized knowledge-workers in one location, the region is actually a low cost area for high-technology firms. This effect, high relative productivity, makes real costs of doing certain types of business to be relatively low thus sustaining the power of the cluster to draw new businesses to the region. In Coastal Georgia, the high quality access to inter-modal transportation facilities has had the effect of creating a transportation/warehouse/distribution cluster.

- **REMI Models the Impact of Changes in Economic Conditions or Competitiveness**

State Governments, Development Authorities and Communities constantly seek to change regional competitiveness to attract new firms or to diversity economies. The policies implemented are specifically designed to make the economic future of a region look different from its past. As a dynamic modeling system, REMI can incorporate policy changes and simulate the effect of alterations in the framework of development.