Understanding Fiscal Conditions and Impacts of Local Governments Under Increased Natural Disaster Risk and Changing OCS Environment

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Outline

- COMPAS Model and Its Linkage to Fiscal Health
- Fiscal Module of COMPAS Framework
- Data and Methodology
- Case Study of Lafayette Parish
- Results and Discussions

Synthesis of BOEMRE Studies

- Research output is a compilation of two projects

Schafer, Mark. J., Troy C. Blanchard, J. Matthew Fannin, and Tim M. Slack. “Improving Capacity for Institutional Analysis of the Oil and Gas Industry for the Gulf of Mexico Region.” Coastal Marine Institute, BOEMRE.

Keithly, Walter, J. Matthew Fannin, and Mark Schafer. “Evaluating the Public Infrastructure and Service Impacts of OCS-related Activities to Coastal Communities Impacted by Hurricanes Katrina and Rita.” Coastal Marine Institute, BOEMRE

Tasks Accomplished

- Scenario Development: Caroline Boen and Dr. Walter Keithly
- Running MAGPLAN: J. Matthew Fannin
- Modeling the public sector: Arun Adhikari and J. Matthew Fannin
- Determining Ratios in Financial Health: J. Matthew Fannin

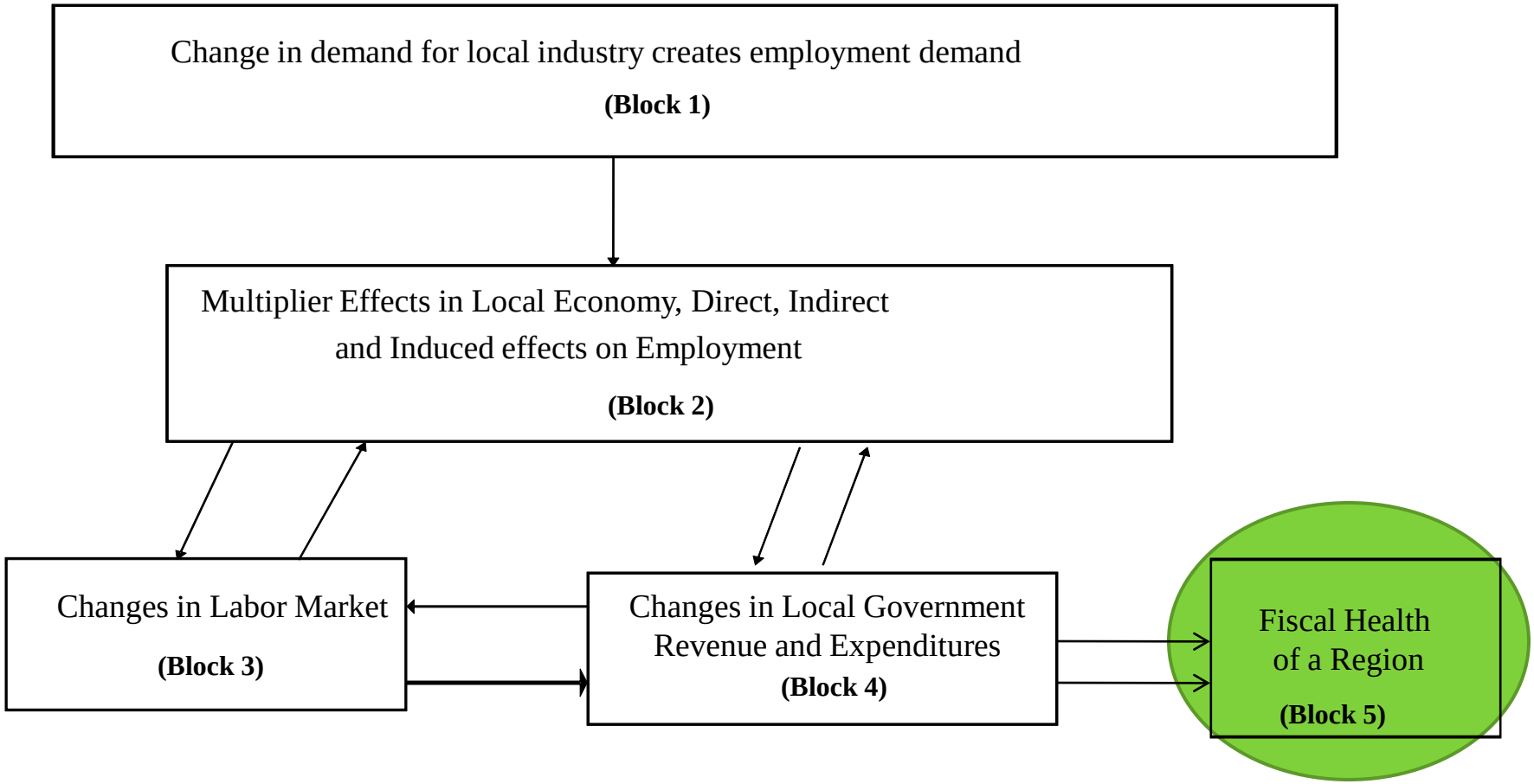
Background and Overview of COMPAS Modeling

- COMPAS models are regional economic models that combine input-output and econometric approaches to build a conjoined model of economic structure.

- COMPAS models typically treat employment demand as an exogenous driver of changes in the labor market which ultimately impact the fiscal sector. These fiscal impacts identify total revenue and expenditures of a region which can then be used to calculate net assets and liabilities to determine the financial condition of a region

- The fiscal module in this research is an extension to the module used by Fannin et al. (2008) and Adhikari and Fannin (2010).

Overview of COMPAS Modeling and Its Linkage to Fiscal Health



Background of Fiscal Module in COMPAS Framework

- Analysis of local government fiscal behavior focuses largely on the demand for local public goods and services. The effects on local government's ability to generate tax and other forms of revenue conceptualize the fiscal impacts

- Local governments consider the demands of their residents and provide the desired level of services at lowest possible cost. Various factors like income, wealth, education, assessed valuation and retail sales are responsible for demands for public services by the residents

- Given the structural nature of COMPAS model, output from the revenue capacity equations are used as explanatory variables in the expenditure equations

Objectives of the Study

Modeling the public sector:

- Labor Market Equations: Population, In-commuter Earnings and Out-commuter Earnings
- Revenue Capacity Equations: Assessed Valuation and Retail Sales
- Expenditure Equations: Public Safety, Public Works, Health and Welfare, and General Government
- Total revenue : Property Tax, Sales Tax, State Transfer Revenue and All Other Revenue

Evaluating the fiscal sector of OCS region to understand the fiscal health and impacts of local government under increased natural disaster risk and changing OCS environment

Empirical Specifications

- Empirical specification and model building of labor force module is an extension to the model proposed earlier by Johnson (2006), Swenson (1996), Adhikari and Fannin, (2010) and Fannin et al. (2008). Population, in-commuter earnings and out-commuter earnings were estimated.

- Fiscal module specification is an extension to Fannin et al. (2008), Adhikari and Fannin (2009) and Adhikari and Fannin (2010). Revenue streams (revenue capacity equations) and expenditure streams were estimated to measure the fiscal health of a region that includes calculation of net assets of a region.

- Fiscal health specification is an extension to Barreca and Fannin (2010), where different ratios were calculated to determine the financial condition of the region.

Data and Methodology

Data Sources:

- Audited Financial Statements
- Bureau of Economic Analysis
- U.S. Census Bureau
- Bureau of Labor Statistics
- Department of Education

A panel data model is analyzed starting from 1990 to 2008 and a scenario is built up to forecast changes for the labor market, revenue capacity and expenditure equations

Fiscal health is determined based on the net assets and liabilities derived from the fiscal module of COMPAS model

A Case Study: Lafayette Parish

- Lafayette Parish makes up more than half of the total mining and oil and gas extraction jobs in the LA-2 region (BOEMRE manuscript). Impacts from reduction in drilling are likely to be more in this region as employment could be measurably affected.

- Number of oil and gas wells forecast was extracted from the hybrid model of oil and gas (Boen et al. 2011). According to this model, the total number of wells to be drilled in the Gulf of Mexico LA-2 region in the year 2011 would be 119.

- This place of work employment was inserted in the MAGPLAN model (Fannin) to calculate the total number of jobs in the region. As a result, total number of jobs that would be generated by drilling 119 wells in LA-2 area comes out to be 3,643 in Lafayette Parish (direct, indirect, and induced).

A Case Study: Lafayette Parish

Calculation of Revenue Streams from COMPAS Model

Variables	Source	Baseline	Scenario	Difference	% Diff
Place of Work Employment	MAG-PLAN	175,877	172,234	-3,643	-2.07%
Population	Blanchard et al	221,578	211,086	-10,492	-4.74%
In-commuter Earnings ($)	Adhikari and Fannin - LM	2,126,916,622	1,924,421,790	-202,494,832	-9.52%
Out-commuter Earnings ($)	Adhikari and Fannin - LM	643,464,359	609,772,285	-33,692,074	-5.24%
Assessed Valuation ($)	Adhikari and Fannin - RC	2,099,133,852	1,965,715,743	-133,418,109	-6.36%
Retail Sales ($)	Adhikari and Fannin - RC	4,741,330,805	4,463,651,354	-277,679,451	-5.86%
Property Tax Revenue ($)		54,463,360	51,001,742	-3,461,618	-6.36%
Sales Tax Revenue ($)		79,688,802	75,021,770	-4,667,032	-5.86%
All Other Revenue ($)		79,793,117	76,014,811	-3,778,306	-4.74%
	Total Revenue ($)	**213,945,279**	**202,038,324**	**-11,906,955**	**-5.57%**

A Case Study: Lafayette Parish

Calculation of Expenditure Streams from COMPAS Model

Variables (Per Capita)	Source	Baseline	Scenario	Difference	% Diff
General Government ($)	Adhikari and Fannin - FM	224.83	199.56	-25.27	-11.24%
Health and Welfare ($)	Adhikari and Fannin - FM	24.56	23.55	-1.01	-4.11%
Public Safety ($)	Adhikari and Fannin - FM	227.02	200.27	-26.75	-11.78%
Public Works ($)	Adhikari and Fannin - FM	184.00	172.37	-11.63	-6.32%
All Other Expenditure ($)		286.59	286.59	0.00	0.00%
	Total Expenditure ($)	**209,834,366**	**186,250,450**	**-23,583,916**	**-11.24%**
Net Expenditures (Net Assets to Balance Sheet) ($)		**4,110,913**	**15,787,874**	**11,676,961**	

Discussion of Results from the Case Study

- Results show that the revenue change exceeds the expenditure change.
- Per capita expenditure seems to be higher because of post-Katrina effects on financial statements. Since data included the year 2008, the numbers have also been inflated because of hurricanes Gustav and Ike.
- Change in expenditure is higher because the data were based on the periods when there were high levels of intergovernmental transfers between 2004 and 2008. Hence, the model potentially overestimates increases in public service expenditures given the influx of disaster fund sthat were spent in the area.
- Model seems to be upward biased since labor market equations were based on 19 years of data (1990–2008) while fiscal module equation has only one year of data in panel (2004 to 2008) prior to Katrina.

Financial Health Impacts

- We treat the positive net revenue as additions to the net assets (equity) of the parish government
- How do these changes impact their short-run cash flow and long-run solvency?
- This is where we merge our models of the current account of the parish government (COMPAS) with our financial health modeling

Financial Health Impacts

- Liquidity
  - Lafayette Parish has a current ratio (current assets / current liabilities) (a measure of liquidity) of 6.71 in 2009 (latest year of audited statements)
  - The addition of $11.6 million from the baseline to net assets (as cash) increases their current ratio to 6.99, well above the healthy rule of thumb ratio of two
- Leverage
  - Lafayette Parish's debt to net asset ratio reduces from 1.21 to 1.17. While their ratio exceeds the desired maximum healthy ratio of 1, (and extremely healthy ratio of 0.5), the increased dollars help to move them toward a more solvent position

Financial Health Impacts

- Profitability
  - Lafayette Parish has a Return on Net Assets ratio (Total Revenues – Total Expenditures)/Net Assets of 0.0311
  - Since the rule of thumb is that profitability should grow at the rate of inflation for a public sector entity, this ratio seems acceptable as long as they remain this level in future years and public sector inflation remains subdued

Conclusion

- COMPAS Model for measuring OCS labor market and local government revenue and expenditure effects can be merged with financial health modeling to evaluate how OCS activities impact the long-run solvency of local governments

- Currently coding financial health of neighboring Gulf of Mexico states to expand along all of the Gulf Coast

- Will incorporate geographic units projects to determine new multi-county regions to identify labor market and fiscal effects and these policy-focused geographies

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