How to Forecast Changes in a Local Government's Fiscal Health

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Abstract

The primary objective of the study is to analyze the differences in net economic effects with and without a given exogenous shock in a local economy. These net effects are then inserted into a COMPAS modeling framework to acquire net revenue and expenditure changes of the economy. These changes are then used to calculate changes in financial health of a region's local government.

Problem Statement

❖ Rural local governments often lack the professional capacity to understand how their economy impacts their local government's fiscal condition. Local governments face more challenges than ever before in terms of resiliency when trying to bounce back from various exogenous shocks and uncertain circumstances.

❖ Most local governments are not prepared with necessary financial resources to address short-term and long-term issues of response and recovery after exogenous economic shocks such as a plant closing or natural disaster.

❖ Lack of financial preparation can have long-term ramifications in terms of reduced delivery of recurring public services which may create a public service input level that results in residents migrating out of a region.

Introduction and Objectives

❖ Fiscal health of a local government indicates its ability to provide adequate and uninterrupted services to its constituents (Honadle, Costa and Sigler, 2004). An agency is fiscally healthy, as described by Berry, (1994), based on the extent to which its financial resources exceed its spending obligations.

❖ Individuals that collaborated with the Rural Policy Research Institute (RUPRI) developed the Community Policy Analysis System (COMPAS) modeling framework for individual states that allows local officials to evaluate local government revenue and expenditure forecasts from exogenous changes in economic activity (Johnson, Otto and Deller, 2006.

❖ There is a separate tradition in Minnesota that focused on extension assistance to help local governments assess and address ways to improve fiscal health (Honadle, Costa and Sigler, 2004).

❖ However, there have been no efforts from our review of research or extension literature that has linked these economic forecasts from COMPAS with fiscal health analysis of local governments from the Minnesota extension tradition in a comprehensive way. Hence, the issue of linking the COMPAS model with financial health analysis to educate stakeholders drives the motivation for this study.
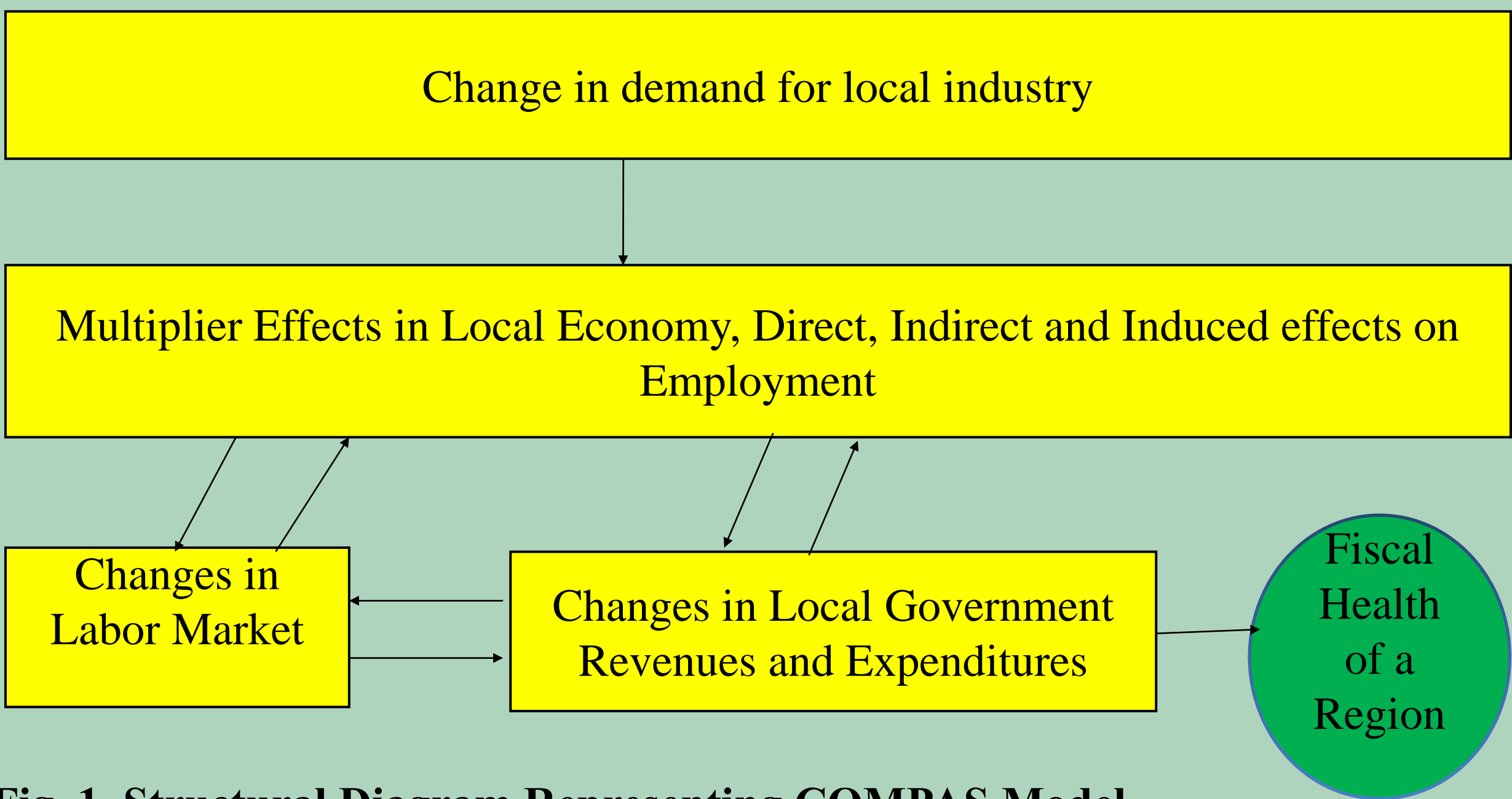
COMPAS Model

Fig. 1. Structural Diagram Representing COMPAS Model

❖ COMPAS models typically combine input-output and parametric econometric modeling to build a conjoined model of rural economic structure (Johnson, Otto and Deller, 2006).

❖ COMPAS models are mostly used to evaluate impacts within a small city, region or county and these models typically treat employment demand as an exogenous driver of changes in the labor market which ultimately impact the fiscal sector.

❖ COMPAS models use statistically estimated relationships to forecast changes in demographic, economic and fiscal conditions under exogenous changes in economic activity and include a system of cross sectional econometric equations estimated for communities in respective states.

Data and Methodology

❖ In addition to our baseline scenario, we develop a scenario forecasting changes in the number of offshore oil and gas wells to be drilled in order to understand changes in on-shore area effects for a given South Louisiana region.

❖ To generate the forecast for the place of work (POW) employment, product (oil) demand, labor force and fiscal modules, we acquire data from Bureau of Ocean Energy Management (BOEM), Census Bureau, audited financial statements of parish governments, and BEA and BLS data.

❖ Results from an OLS regression will be used to forecast the product demand. After the estimation of product demand in the future period, those numbers will be incorporated in the MAG-PLAN model in order to generate the final demand for various sectors in an economy and forecast employment change. MAG-PLAN is an input-output model coded to generate final demand expenditure profiles for off-shore drilling activities.

❖ This will generate the employment change applied to the Louisiana Community Impact Model (LCIM) (a COMPAS model for Louisiana) to generate larger labor force and fiscal impacts of a region.

❖ The assessment of a local government's fiscal health is performed by measuring different aspects of financial health that include revenues, expenditures, assets, liabilities, operating structure and debt, among others. Financial ratios, a useful tool for evaluating entities in public sector, are calculated to demonstrate overall financial situation of a local government.

❖ These ratios are based on profitability, liquidity, capital structure and performance of the local government (Barreca, 2010) and compared with baseline scenario (no shock) to figure out changes in fiscal condition in the future, based on the aforementioned exogenous economic shocks to both offshore mining.

Empirical Specifications

LABOR FORCE MODULE

$EMP = \beta_{10}+\beta_{11}WAGE+ \beta_{12}EARN+\varepsilon$

$WAGE= \beta_{20}+\beta_{21}EMP+ \beta_{22}UNEMP+ \beta_{23}WAGLAG+ \varepsilon$

$POP= \beta_{30}+\beta_{31}EMP+ \varepsilon$

$UNEMP = \beta_{40}+\beta_{41}EMPOP+ \beta_{42}WAGE+ \beta_{43}UNEMPLAG +\varepsilon$

$INCOMM = \beta_{50}+\beta_{51}RELLOCWA+ \beta_{52}RELLOCUN+ \beta_{53}EMPOP +\varepsilon$

$OUTCOMM = \beta_{60}+\beta_{61}RELLOCWA+ \beta_{62}RELLOCUN+ \beta_{63}EMPOP +\varepsilon$

$LABFOR = \beta_{70}+\beta_{71}POP+ \beta_{72}ELDPOP+ \beta_{73}WAGE +\varepsilon$

FISCAL MODULE

Revenue Capacity Equations:

$ASDVAL = f(LNDNSTY, OUTCOMEARN, RESEMPEARN)$

$RETSALE = f(LNDNSTY, INCOMEARN, OUTCOMEARN, RESEMPEARN)$

Expenditure Equations:

$GG\ EXP = f(ASDVAL, RETSALE, TOTINC, LNDNSTY, LCLRDMLS, POP)$

$HW\ EXP = f(ASDVAL, RETSALE, TOTINC, PERAFAM, ELDPOP, LCLRDMLS, POP)$

$PS\ EXP = f(ASDVAL, RETSALE, TOTINC, PERAFAM, POPPLUS, POP)$

$PW\ EXP = f(ASDVAL, RETSALE, TOTINC, PERURB, LNDNSTY, LCLRDMLS, POP)$

FINANCIAL RATIOS

Ratio Type	Ratio Names	Calculation Method
Profitability	Return on Equity	Net Surplus (Deficit)/Net Assets
	Return on Assets	Net Surplus (Deficit)/Total Assets
	Profit margin	Net Surplus (Deficit)/Total Revenues
Liquidity	Current Ratio	Current Assets/Current Liabilities
Leverage	Debt to Equity	Total Liabilities/Total Equity
	Long-term Liabilities to Total Assets	Long term Liabilities/Total Assets
Performance	Assets Turnover	Total Revenues/Total Assets
	Tax Revenues to Total Revenues	Tax Revenues/Total Revenues
	Operating Ratio	Total Revenues/Total Expenditure

Variable Description, Louisiana COMPAS Model

Variables	Description
EMP	Place of work employment
WAGE	Average wage per job
UNEMP	Unemployment
POP	Total Population
INCOMM	Total In-commuters
OUTCOMM	Total Out-commuters
LABFOR	Total labor force
WAGLAG	Wage lag
UNEMPLAG	Unemployment lag
RELLOCWA	Relative local wage (avg local wage/avg continuous wage)
RELLOCUN	Relative local unemployment (local unemployment/contiguous unemployment)
EMPOP	Relative employment opportunities (local employment/contiguous employment)
ELDPOP	% Population over 65 years of age
OUTCOMEARN	Out-commuter earnings
INCOMEARN	In-commuter earnings
RESEMPEARN	Resident Employed Earnings
LNDNSTY	Arable Land Density
GG EXP	General Government Expenditure
HW EXP	Health and Welfare Expenditure
PS EXP	Public Safety Expenditure
PW EXP	Public Works Expenditure
ASDVAL	Assessed Value
RETSALE	Retail Sales
LCLRDMLS	Local Road Miles
TOTINC	Total Income (in thousands)
PERAFAM	Percent African American
PERURB	Percent Urban

Contribution

❖ Results from this study would better assist financially strapped local governments understand tradeoffs from alternative economic development scenarios so they can attempt to be sustainable for the long-term rather than focusing on short-term economic benefits.

❖ This study is one of the first studies to combine the strengths of COMPAS based modeling with local government fiscal health measurement and has the potential to add to the pragmatic value of COMPAS modeling through its extension into additional local government jurisdictions to determine their financial health.

❖ We also believe that the tool has potential to improve the budgeting activities of local governments as well as motivate increased discussion about optimal strategies for measuring the resiliency power of a local government since it gives an indication of total cash reserves and provides a better understanding of the liquidity and solvency condition of the local governments.

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