

KEY QUESTIONS

Can public investment offset GDP decline due to government expenditure cuts in the EU?

How will government expenditure cuts affect industries?

How much will the EU Fiscal Compact affect employment on the macroeconomic and industry levels?

Will higher public investment benefit or impede the objective of lowering government deficits?

What is the way forward for the EU, strict austerity or growth oriented policies?

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EU struggles to stay afloat: Lowering deficits by balanced budgets or increased investment?

After witnessing its most dramatic decline of the 21st century in 2009, economic recovery in the European Union has been elusive. In 2012, the EU fell into a double-dip recession with unprecedented unemployment rates in many member states. These numbers reveal a trend that is disturbing for most European officials and residents: the EU, unlike other world powers, is not bouncing back from the 2008 financial crisis (Fig 1).

With the falling GDP and the government bank bailouts, sparked by the global financial crisis in 2008, public debt in the European Union has significantly increased. In response to these dual issues afflicting the region, namely falling GDP and rising government debt, there has been much debate among EU leaders on how to move forward and which policies will best assist the struggling economies. Through these debates, two distinct camps have emerged.

The first camp, resorting to sink or swim methodology, calls for strict austerity measures through government budget cuts and has controlled the debate for the past three years. They contend that decreasing the deficit will create a business-friendly environment that is attractive to investment and will in turn increase GDP and employment. The second camp calls for growth friendly policies and slowing enforcement of deficit limits to provide a life raft for those countries

BY EMMA DUNN

KEY FINDINGS

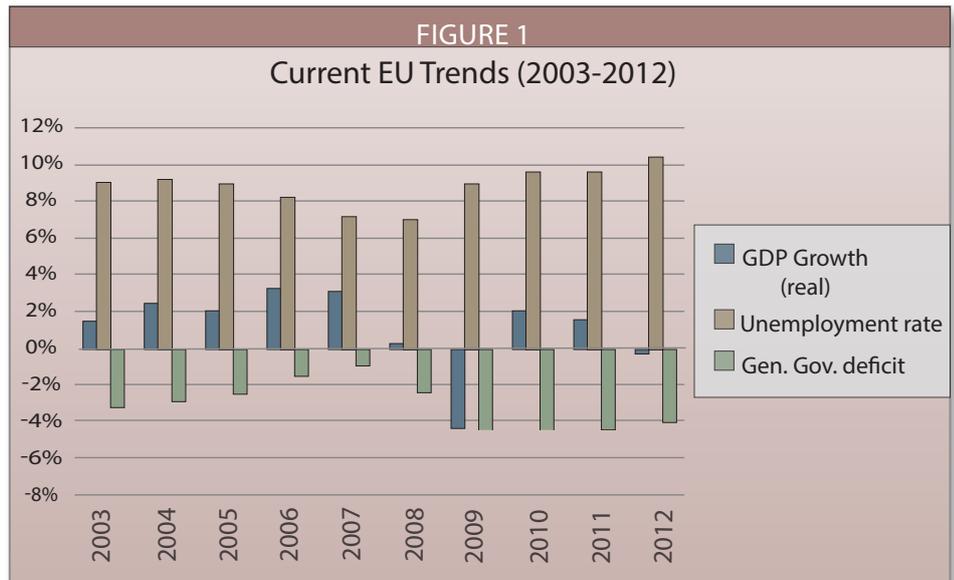
- Government expenditure cuts negatively affect output and employment in every industry in the EU due to linkages between the various sectors.
- Higher public investment combined with moderate government expenditure cuts has the potential to pull the EU out of the current recession.
- Higher public investment will offset the negative repercussions on employment of government expenditure cuts in the EU.
- Increased public investment safeguards more than half of all EU industries from output loss incurred by government expenditure cuts.

struggling to meet targets, arguing that increasing GDP by a wider margin than reducing government spending is the preferred approach to cutting the deficit relative to GDP.

As EU leaders look for the most effective policies, it is critical to assess the effects of the two debated policy options at the macroeconomic and industry level in order to evaluate which proposals better address the EU crisis from the perspective of growth, job creation and deficits as a whole.

Policies Scenarios

In this issue of *The Bridge*, four different policy scenarios specific to the European Union debate concerning austerity vs. growth measures are simulated using the ADRS Online Country Economic Analysis System (OCEANS): Drowning (A1), Sinking (A2), Treading Water (B1), and Floating (B2). The details of these scenarios are described in Table 1.



OCEANS is a web-based economic modeling tool built by ADRS. It uses input-output modeling techniques and provides access to 50 country economic models through a user-friendly web interface. OCEANS allows users to design macroeconomic and industry policy scenarios for a country or region and then simulate the policy's impact on the growth, employment and income of the economy and its sectors.

To learn more about the model used in this analysis, visit www.adrs-oceans.com.

Table 1: Policy Scenarios

Title	Scenario A1 Drowning	Scenario A2 Sinking	Scenario B1 Treading Water	Scenario B2 Floating
Context	The 2013 EU Fiscal Compact requires the national budgets of all participating members to be balanced at a structural deficit limit of 0.5% of GDP.	According to the <i>2020 Strategy</i> , the EU government needs to spend 30b Euros per year on public infrastructure investment. Members are required to follow the Fiscal Compact deficit targets.	The EU mandated deficit targets of 3% of GDP are strictly enforced for all EU members.	According to the <i>2020 Strategy</i> , the EU government needs to spend 30b Euros per year on public infrastructure investment. Deficit targets are set at 3% of GDP.
Description	The EU achieves a 0.5% deficit limit. Revenue/GDP ratios are maintained as 2012, translating to estimated government expenditure cuts of 7% in 2013.	EU public sector investment increases by the equivalent of 1.3% of total investment of 2012 and government expenditure is cut by 7% in 2013.	The EU achieves a 3% deficit limit. Revenue/GDP ratios are maintained as 2012, implying government expenditure cuts of 2% in 2013.	EU public sector investment increases by the equivalent of 1.3% of total investment of 2012 and government expenditure is cut by 2% in 2013.

COMPARATIVE ANALYSES OF SCENARIO RESULTS

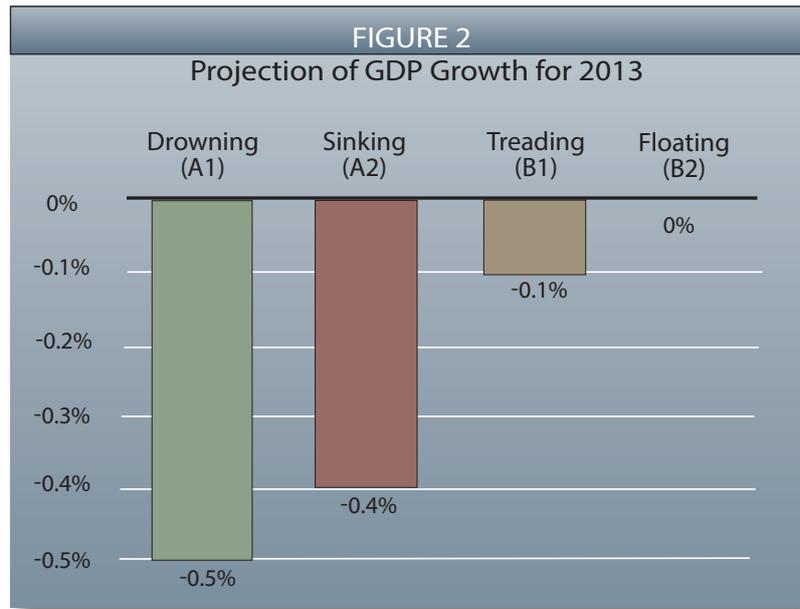
This section compares and contrasts output and employment of the four policy scenarios.

Macroeconomic Analysis

Output

As shown in Figure 2, balancing the budgets through government expenditure cuts of 7% as in scenario A1 will create a loss in output of 65 billion Euros, translating to a GDP decline of 0.5% in 2013. With higher public investment in scenario A2, losses are reduced to 55 billion and GDP decline slows to 0.4%. In scenario B1, GDP decreases at a rate of 0.1% without greater investment spending, and GDP contraction is halted with added investment of 1.3% in scenario B2.

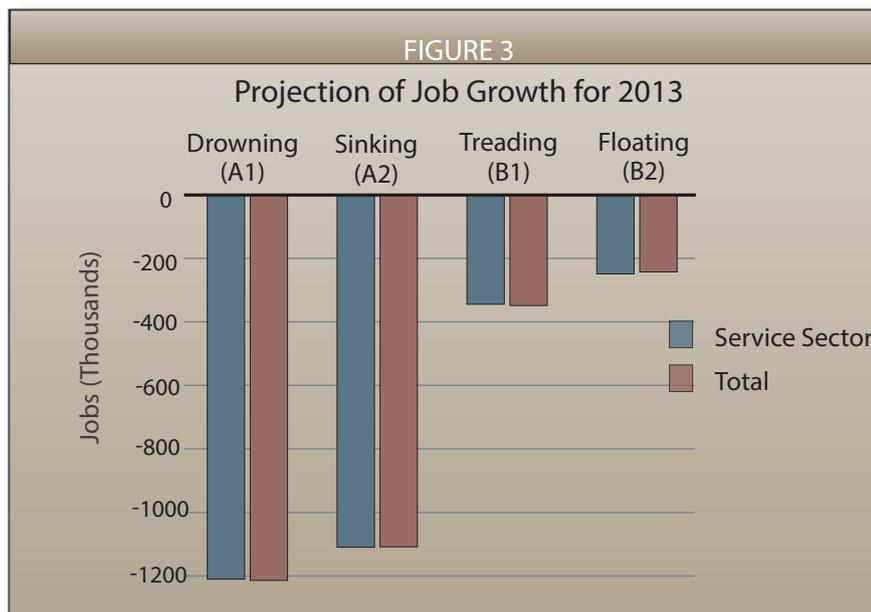
In the scenarios with increased public investment, A2 and B2, negative GDP growth declines by approximately 0.1% as compared to the counterpart scenarios A1 and B1. In the B scenarios, this 0.1% reduction in negative GDP growth is sufficient enough to pull the EU economy out of recession, while maintaining target deficit levels, which is a key objective of EU leaders.



Employment

Employment and job loss is another crucial factor in evaluating the viability of policy options. Cutting government expenditure in 2013 by 7%, as in scenario A1, will result in a loss of 1.2 million jobs. 99% of these job losses occur in the service sector as a direct result of the demand shock, also known as the initial effects. Due to inter-linkages, this contraction reverberates throughout the economy and more jobs are lost due to declining production, income and consumption. Table 2 illustrates these different phases of effects.

Alternatively, due to the positive manufacturing growth in scenario A2, the service sector loses 100,000 fewer jobs due to strong linkages with the manufacturing sector, resulting in a reduced net loss of 1.1 million jobs. The higher investment



“GDP growth increases by 0.1% in the scenarios with increased public investment compared to the counterpart scenarios lacking added investment.”

Scenario	Multiplier Effects ¹ (Jobs in Thousands)						Total
	Initial	1st Round	Industrial	Production	Consumption	Simple	
Drowning (A1)	-1,029	-47	-11	-59	-119	-1,088	-1,207
Sinking (A2)	-963	-32	-3	-35	-104	-998	-1,102
Treading Water (B1)	-294	-14	-3	-17	-34	-311	-345
Floating (B2)	-228	2	6	7	-19	-221	-240

¹For definitions of the different multipliers, visit www.adrs-oceans.com/5

spending of scenario A2 also cushions the manufacturing sector from any job losses and incurs new job growth.

In scenario B1, 345,000 jobs are lost due to the decreased government expenditure of 2% in the same pattern as scenario A1. In scenario B2, a net of 240,000 jobs will be lost. The 100,000 jobs saved from scenario B1 to scenario B2 is due to the positive demand shock in manufacturing and its job creation effects on the service sector due to increased production. As Figure 3 illustrates, higher public investment spending of 1.3% generates more than 100,000 jobs in the region,

primarily in the service sector.

Industrial Analysis

Output

The effect of these demand shocks on individual industries plays a critical role in assessing the most effective path to recovery. The industries hardest hit by all four scenarios are the public administration and defense industry, health/social work industry and education industry due to the government expenditure cuts; yet the degree to which these sectors are affected and the number of other industries influenced vary greatly. The industries

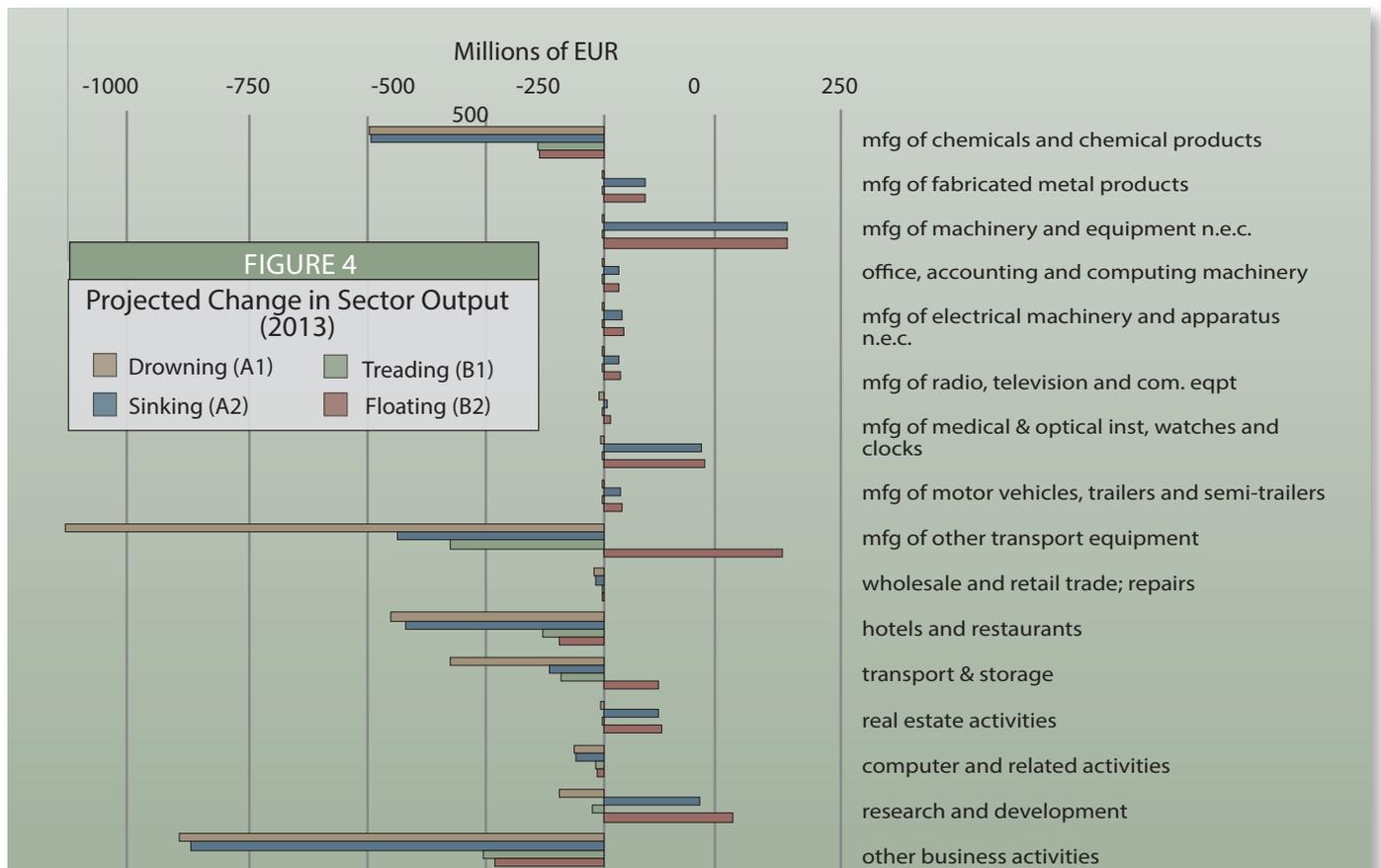
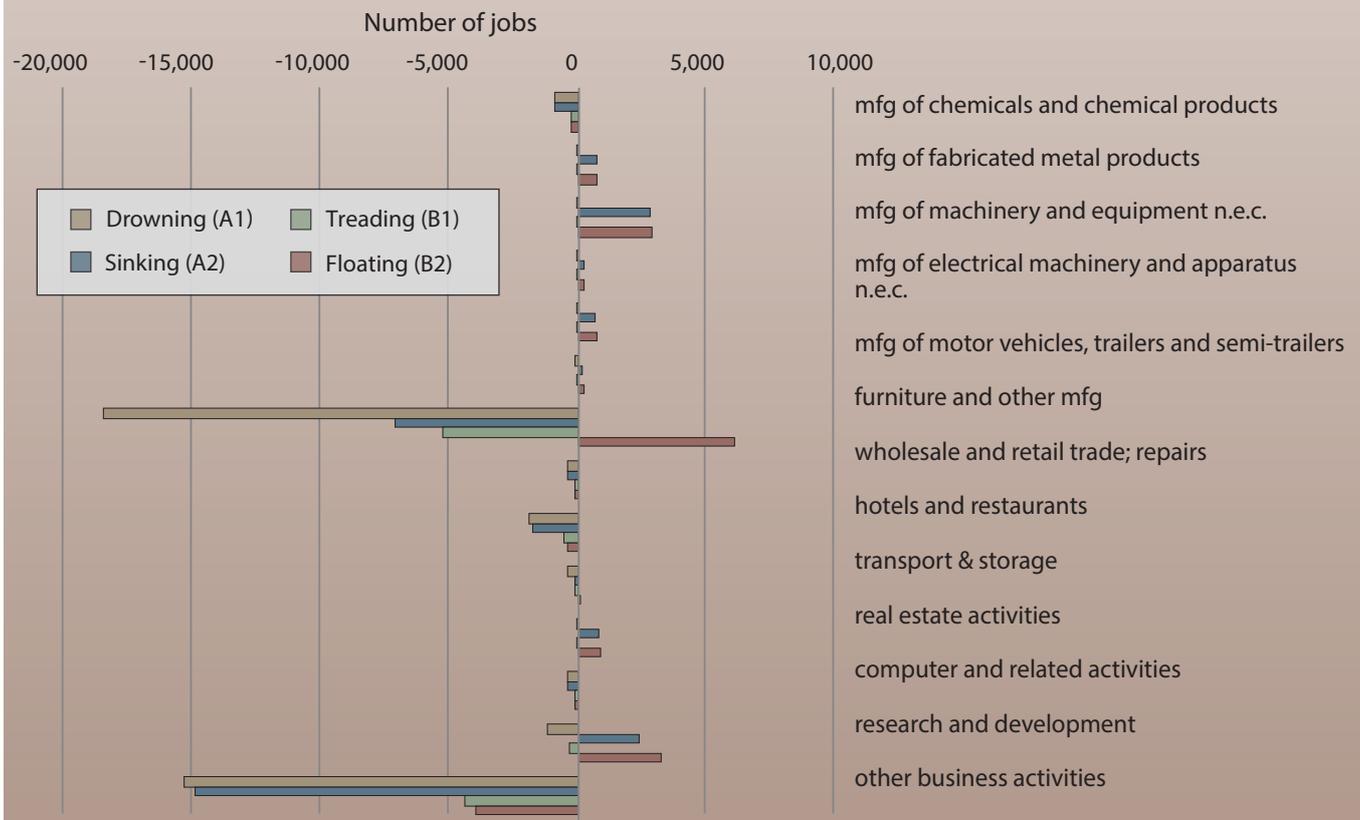


FIGURE 5

Projected Change in Sector Employment (2013)



most noticeably affected are illustrated in Figure 4.

In scenario A1, all 37 industries experience a contraction in output; however, when higher public investment is added in scenario A2, only 17 sectors see a decline in output, meaning public investment enables 20 industries (54%) to absorb the negative shocks of decreased government expenditure. Similarly, in scenario B1, government expenditure cuts of 2% negatively affect the output of all 37 individual industries, while adding public investment of 1.3% reduces this number to 11 industries that experience contracting output in scenario B2.

In the scenarios lacking increased public investment, most of the initial effects of the spending cuts occur in the public administration, health and education industries. As the effects of the initial contractions begin to reverberate through the economy, all other industries with linkages to these sectors, most notably wholesale trade, manufacturing of chemicals, and community/social services, experience declines in output due to reduced

“Increased public investment enables between 54% and 70% of industries in the EU to absorb negative demand shocks and maintain output growth.

production and consumption demand. Whereas in scenarios A2 and B2 with increased public infrastructure investment, only those industries with the strongest linkages to the aforementioned sectors contract in output, while 55 -70% see growth, most dramatically the construction industry. This mitigating effect is mirrored with regard to employment.

Employment

As opposed to job losses occurring in all 37 sectors, as in scenarios A1 and B1, twenty sectors in scenario A2 and 26 sectors in scenario B2 experience a cushioning effect similar to that seen in the sector output results due to higher public investment spending. The industries most noticeably affected by the demand shocks in the four scenarios are captured in Figure 5.

Implications

With the current decline of GDP in the EU and the persistence of high deficit to GDP ratios, it is clear that EU leaders need to make crucial policy decisions. Analysis of the results from OCEANS highlights four links between the scenarios and the potential performance of the EU economy.

1. Focus on moderate government expenditure cuts of 3% of GDP implemented in tandem with increased public investment has the potential to cease negative GDP growth and pull the EU economy out of the current double-dip recession.
2. Public investment spending has the capability to effectively mitigate job losses in the EU economy from contractions, protecting hundreds of thousands of European citizens' livelihoods.
3. Higher public investment implemented concurrently with government expenditure cuts safeguards a greater number of individual industries from the negative reverberations of expected output and employment contractions due to the current public expenditure cuts.

4. The industry protection effects of increased public investment are stronger when government expenditure cuts are moderate.

5. Since government deficits are calculated against GDP, the positive effect on GDP growth of increasing public investment assists in reaching lower deficit to GDP ratio targets.

These results point to the need for increased public investment during periods of austerity in order to mitigate the inevitable negative effects of decreased government expenditure on output and employment both on the macroeconomic and industry level. The results also demonstrate that higher public investment can only protect the economy from recession when the austerity is moderate. These findings illustrate the projected outcomes of both sides of the EU policy debate. The results offer insights into the harmful implications of the previously commanding austerity camp and add weight to the pro-growth argument.

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ABOUT



APPLIED DEVELOPMENT RESEARCH SOLUTIONS is an independent economic consultancy organization with extensive experience in economic model building, capacity building, policy research, and advisory services in Africa. Our innovative web-based interface gives users the power to design policies and test their impact prior to embarking on implementation.

THE BRIDGE is an ADRS policy brief designed to present the main findings of policy simulations on key development challenges. With each issue we present the quantification of policy options in order to support evidence-based policy decision-making and to contribute to current economic policy analysis and debate.

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ADRS MODELS OF THE SOUTH AFRICAN ECONOMY

BRIDGING RESEARCH AND DEVELOPMENT

Applied Development Research Solutions (ADRS) has developed six economic models of South Africa that interested individuals and institutions can use for projections, policy design and impact analyses. The models include a highly disaggregated macroeconomic model, two tax and transfer microsimulation models of households, a linked macro-micro model, and two linked national-provincial models of South Africa. Following is a brief description of each model:

MACROECONOMETRIC MODEL OF SOUTH AFRICA (MEMSA)[™]

This model captures the complex inter-linkages that exist between and within industrial sectors of the economy, macro-economic variables, policy variables, and income and expenditure of government, labour, and business. MEMSA is a bottom up disaggregated model with 7 estimated variables for 41 sectors of the economy. It is most suitable for forecasting and simulating the impact of domestic and international shocks, macroeconomic and industrial policy changes, major public expenditure projects, as well as policies that affect private businesses, government and household income and expenditure. MEMSA is hosted at the ADRS website and is accessible through its user-friendly platform.

SOUTH AFRICAN TAX AND TRANSFER SIMULATION MODEL (SATTSIM)[™]

ADRS has built this microsimulation model of South Africa for the projection of costs and benefits of current and future tax and transfer policies. Users of the model can design simple or complex tax and transfer policies for the next 15 years and assess their budgetary, poverty and income distribution effects. Model results are presented in aggregate and disaggregated forms, i.e., by gender, family type, quintile, province, and locality. In addition to a direct and an indirect tax modules, the model includes modules for current social security programmes (i.e., old age grant, child support, disability grant, and care dependency grant), and five additional grant programmes (i.e., care giver support, the basic income grant, youth grant, unemployment grant and adult grant) that are not currently part of the social security system in South Africa but can be used to develop 'what if' scenarios. SATTSIM is hosted at the ADRS website and is accessible through its user-friendly platform.

ADRS MODELS

- MEMSA[™]: Macroeconomic Model of South Africa
- SATTSIM[™]: South African Tax and Transfer Simulation Model
- SATTSIM-Plus[™]: Augmented South African Tax and Transfer Simulation Model
- DIMMSIM-SA[™]: Dynamically Integrated Macro and Micro Simulation Models of South Africa
- LNP-Macro[™]: Linked National-Provincial Macroeconomic Model of South Africa
- LNP-MM[™]: Linked National-Provincial Macro-Micro Model of South Africa

MEMSA

SATTSIM

SATTSIM

Plus

AUGMENTED SOUTH AFRICAN TAX AND TRANSFER SIMULATION MODEL (SATTSIM-PLUS)TM

This model is an extension of SATTSIM. It allows users to produce projections of the tax revenue, social security beneficiaries and cost, and poverty and income distribution under alternative scenarios for the performance of macroeconomic indicators (e.g., growth, employment, inflation, and wage rate) over the next 15 years. Or, for a given scenario for the future performance of the South African economy (e.g., low or high economic growth during next three years), users can make changes to the social security and tax system and simulate their impact on the rate of poverty and income inequality. SATTSIM-Plus is hosted at the ADRS website and is accessible through its user-friendly platform.

DYNAMICALLY INTEGRATED MACRO AND MICRO SIMULATION MODELS OF SOUTH AFRICA (DIMMSIM-SA)TM

This model integrates the ADRS macroeconomic model (MEMSA) with its household microsimulation model (SATTSIM) to capture the dynamic interactions between the macroeconomic performance and the poverty and income distribution at household level. The model is most suitable for the analysis of poverty and inequality and for the impact analyses of alternative macro and micro policies for growth and development. It includes two-way interactions between its macro and micro components such that (a) changes in macroeconomic variables (e.g., prices, employment, wage rates, benefits, transfers, etc.) influence the welfare of individuals and families, and (b) changes in household level economic conditions (e.g., poverty, inequality, consumption, taxes, eligibility for social grant, etc.) influence macroeconomic outcomes. DIMMSIM-SA is hosted at the ADRS website and is accessible through its user-friendly platform.

DIMMSIM-SA is most suitable for the impact analyses of alternative macro and micro policies for growth and development.

LINKED NATIONAL-PROVINCIAL MACROECONOMETRIC MODEL OF SOUTH AFRICA (LNP-MACRO)TM

The purpose of the ADRS provincial macroeconomic model is to produce projections of growth, investment, and employment for 27 sectors of each of the nine provinces in South Africa. The model captures the economic structure of nine provinces using econometric estimations of sectors of provincial investment, output and employment and nine linked national-provincial input-output tables. The latter captures sector linkages within provinces and between provinces and the rest of the South African economy. The model is most suitable for forecasting the impact of national level policies on provincial economies or the impact of provincial initiatives on the province and the rest of the country. A second version of the model, **LINKED NATIONAL-PROVINCIAL MACRO-MICRO MODEL OF SOUTH AFRICA (LNP-MM)TM**, allows additional assessments of the impact of policy scenarios on national and provincial poverty and income distribution.

LNP-Macro
& LNP-MM

For more information on ADRS models, visit the ADRS website or send your enquiries to adelzadeh@adrs-global.com.