

**APPENDIX C**

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**ADJUSTMENT OF THE REMI CONTROL  
FORECAST**

The AQMP uses SCAG's forecasts on population, employment, and other economic variables for future emission projections (Health and Safety Code Section 40460). The REMI model generates a baseline forecast from which the effects of a policy are evaluated. The REMI and SCAG forecasts use different data inputs and assumptions.

The Massachusetts Institute of Technology (MIT) audit of the AQMD's socioeconomic analyses methods recommended further evaluation of the inconsistency between the REMI and SCAG forecasts. As a result, AQMD and SCAG co-funded a project to resolve the inconsistency. This work was performed by the Center for the Continuing Study of the California Economy (CCSCE, 1993). The CCSCE recommended a three-step process to ensure consistency between REMI and SCAG forecasts.

First, It was recommended that both REMI and SCAG models use the same U.S. projections on population and employment. The 1995 release of the REMI model has the same U.S. population projections as the SCAG model. The adjustment was then made to the U.S. employment projections in the REMI model to ensure that the percentage change in employment between 1994-2000, 2000-2005, 2005-2010, and 2010-2020 be consistent between the two models.

Second, the CCSCE recommended that both REMI and SCAG models use the same birth rates by age cohort. The birth rates in the REMI model from 1994 to 2010 were then replaced with those in the SCAG model.

After the first two adjustments the REMI and SCAG models, however, continued to project different levels of employment due to definitional differences in employment data. The REMI model uses employment data published by the Bureau of Economic Analysis (BEA) while SCAG uses data published by the Bureau of Labor Statistics (BLS). The major difference between these two data sources lies in military personnel and the self-employed. The BEA data include federal military jobs while the BLS data do not. Moreover, the BEA data incorporate a much higher estimate of the self-employed than the BLS data, and the self-employed are embedded in the estimates of sectorial employment in the BEA but are listed separately from the sectorial employment in the BLS.

To overcome the definitional differences between the models, the third recommendation called for the use of similar rates of growth in employment in both models. As such, the employment growth rate in the REMI model from 1994 to 2010 was adjusted by modifying the export shares of key national and local industries. The key industries included apparel (SIC 23), printing (SIC 27), rubber (SIC 30), construction (SICs 15-17), trucking (SIC 42), air transportation (SIC 45), retail (SICs 52-59), wholesale (SICs 50-51), personal services and repair (SICs 72, 76), and miscellaneous professional services (SICs 81, 87, 89). The key industries also vary by county. The number of migrants was also adjusted, as recommended by the CCSCE. The third-step adjustment is iterative in order to ensure that both the region-wide population in 2010 and employment growth rates between 1994 and 2010 at the county level in both models are consistent.

Table C-1 shows the region-wide population in 2010 from the unadjusted and adjusted REMI and SCAG forecasts. Table C-2 has the employment growth rates from the unadjusted and adjusted REMI and SCAG forecasts. The employment growth rates of the adjusted REMI and SCAG forecasts are within one and half percentage points of each other for the entire four-county region.

**TABLE C-1**  
Adjusted REMI versus SCAG Population Comparison

	2010		
	Unadj. REMI	Adj. REMI	SCAG
4-county total	17,906,890 (-3.25%)	18,404,890 (-0.56%)	18,508,983

The figures in parentheses are the percentage differences between REMI and SCAG population forecasts.

**TABLE C-2**  
Adjusted REMI versus SCAG Employment Comparison

	% Growth (1994-2010)		
	Unadj. REMI	Adj. REMI	SCAG
Los Angeles	28.8%	23.0%	24.9%
Orange	27.7%	46.6%	46.6%
Riverside	40.4%	81.0%	81.6%
San Bernardino	35.0%	86.1%	89.0%
4-county total	29.8%	36.4%	37.7%

The differences in assumptions, data sources, and methodologies between the SCAG and REMI models will continue to lead to differences in employment and population projections. Therefore, continual adjustments to the REMI model are necessary in order to ensure the projected growth rates in employment and population between the two models are equivalent.