

ABAG's Regional Forecast Approach

Presentation to Regional Advisory Working Group
Oakland, January 6, 2015

Understanding the Forecast Approach

- Goals of regional forecast
- Historic approach and what has changed
- Model elements and progress to date
- Next steps and schedule



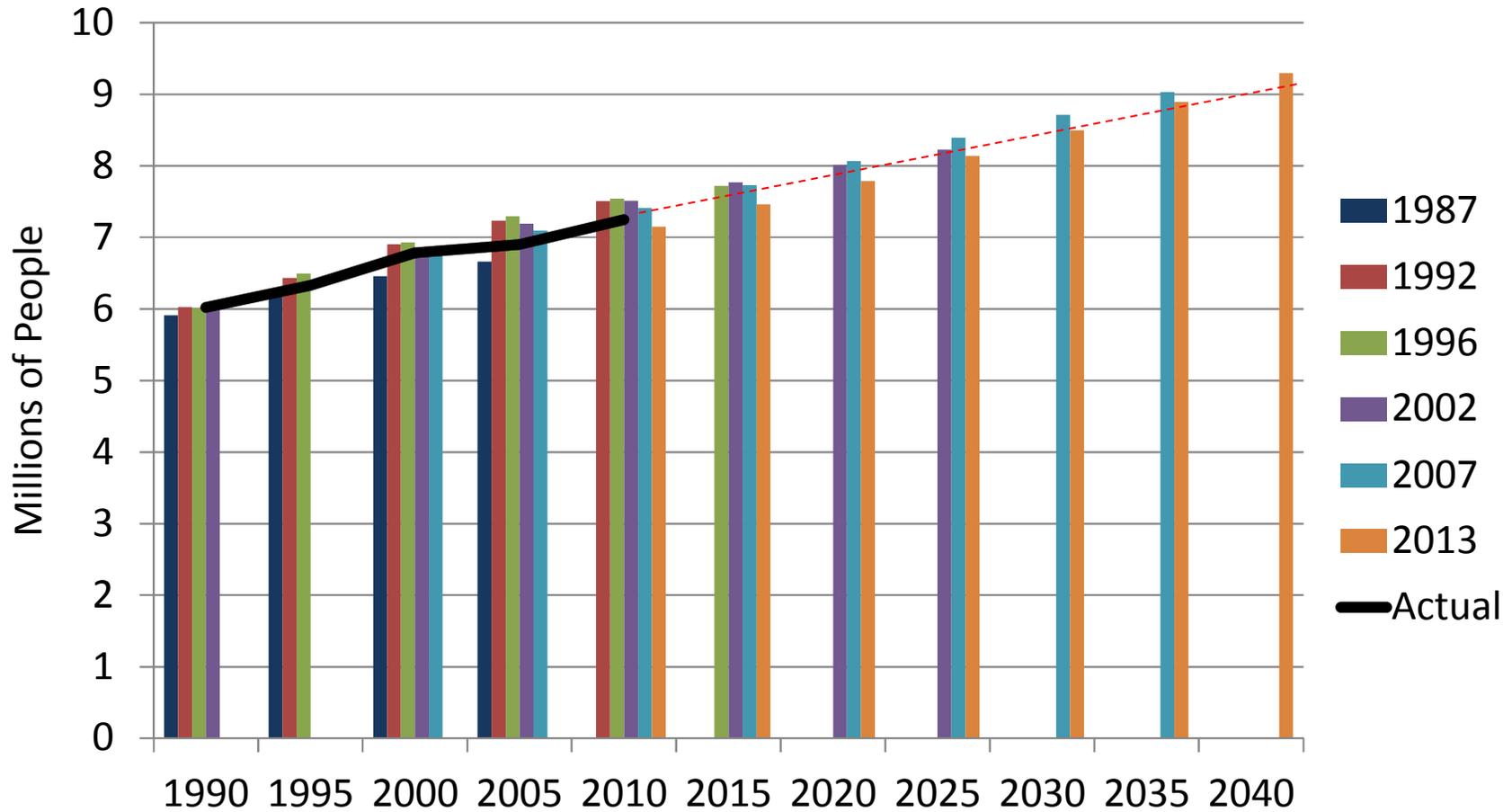
Goals

- Realistic regional forecast based on expected demographic and economic trends
 - Population
 - Jobs and Labor Force
 - Households
 - Output and Income
- Distribution of population, employment, households and labor force based on:
 - Market factors
 - Local policies and plans
 - State GHG reduction requirements

3 Decades of ABAG Modeling History

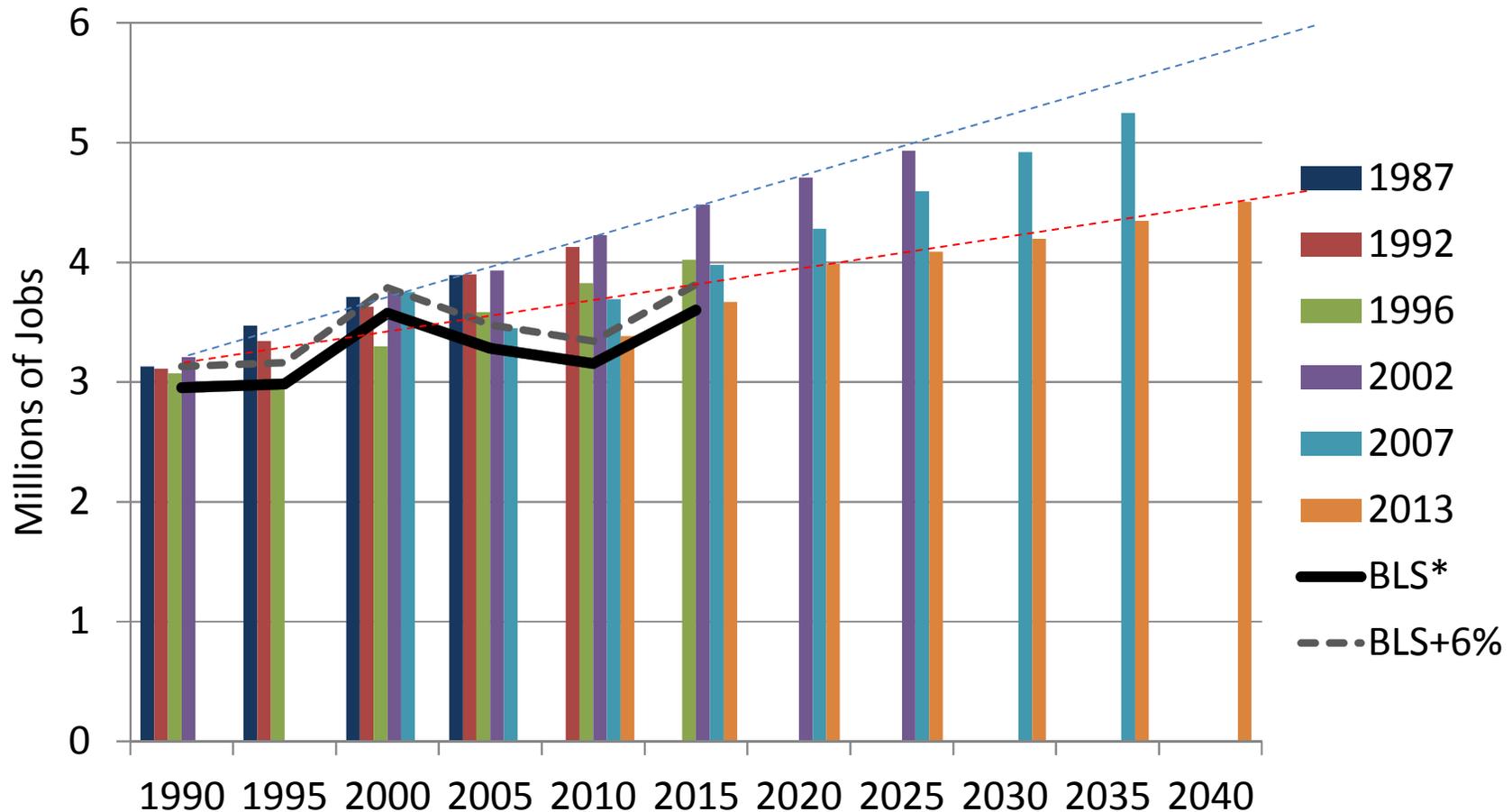
	Brady/Prastacos/ Yang (1980s to 1995)	Fassinger/Yang (1995 to 2009)	Levy/Chapple/ABAG (2012-2013)
Gross Regional Product	Model Projection	Not Projected	Not Projected
Regional Employ't / Industry	econometric and I-O projection	I-O projection from national	Shift Share Projections
Population	cohort survival + employment driven migration	From County Demographic Model	LF demand => projected population; demographic mix from DOF projections
Occupations	Model projection	Not Projected	Step down from Employment
Income	Model projection	Regional I-O from Ntl Forecast	Households by Quartiles internal estimates
Distribution at the subregional level	County Employment Forecasting System (CEFS)	Predictive equations by County	Proportional to Caltrans county forecasts and NETS
Distribution at the small zone/parcel level	Land Use Optimization (POLIS)	POLIS	NETS and CoStar for base year; noncalibrated rule-based approach 4

Past Population Projections



Source: ABAG from earlier Projections series and California Department of Finance.

Past Employment Projections



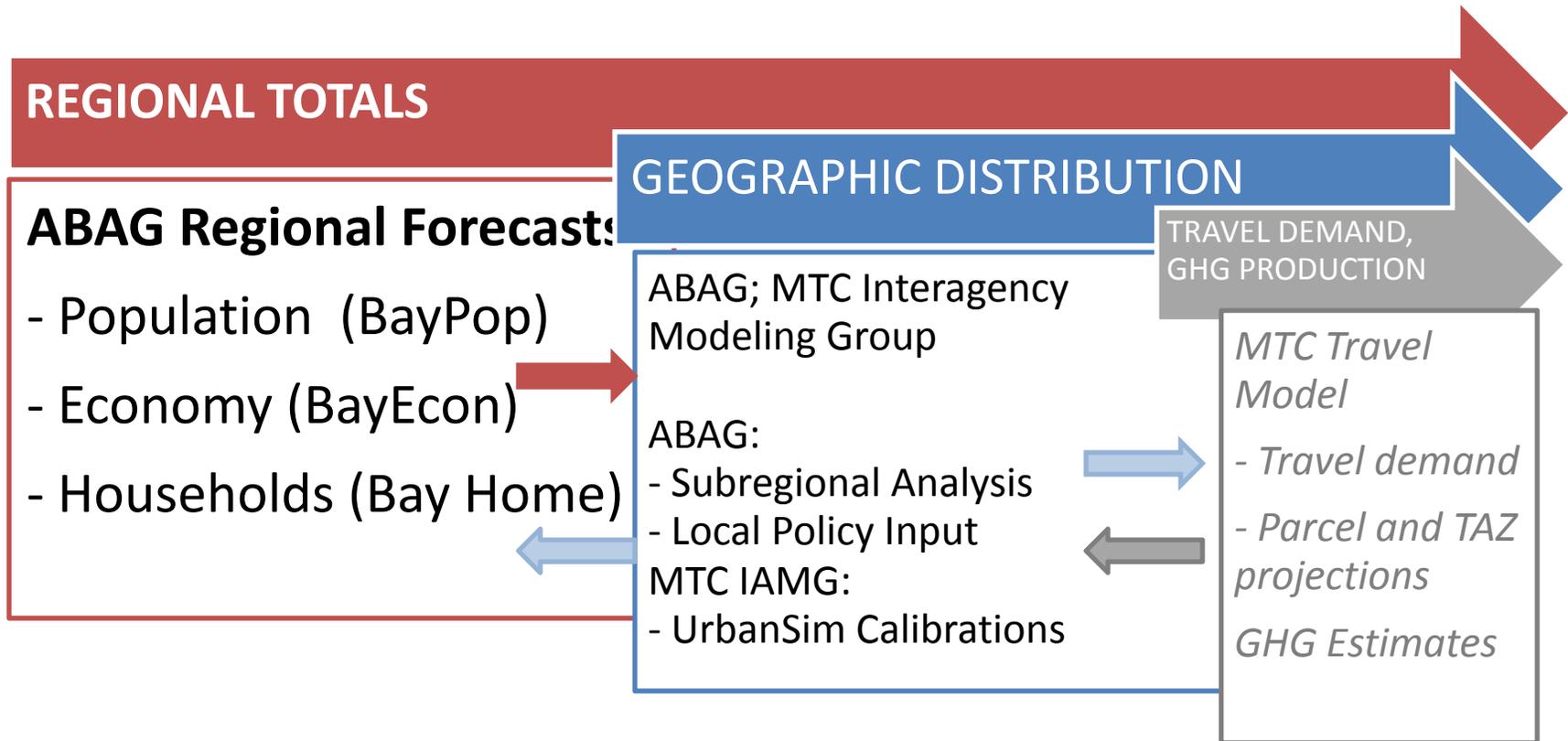
Source: ABAG Projections and California Employment Development Department.

* BLS totals are 6-8% lower than ABAG totals—do not include proprietors and self employed. 2015 date is actually October 2014.

PBA 2017 Approach

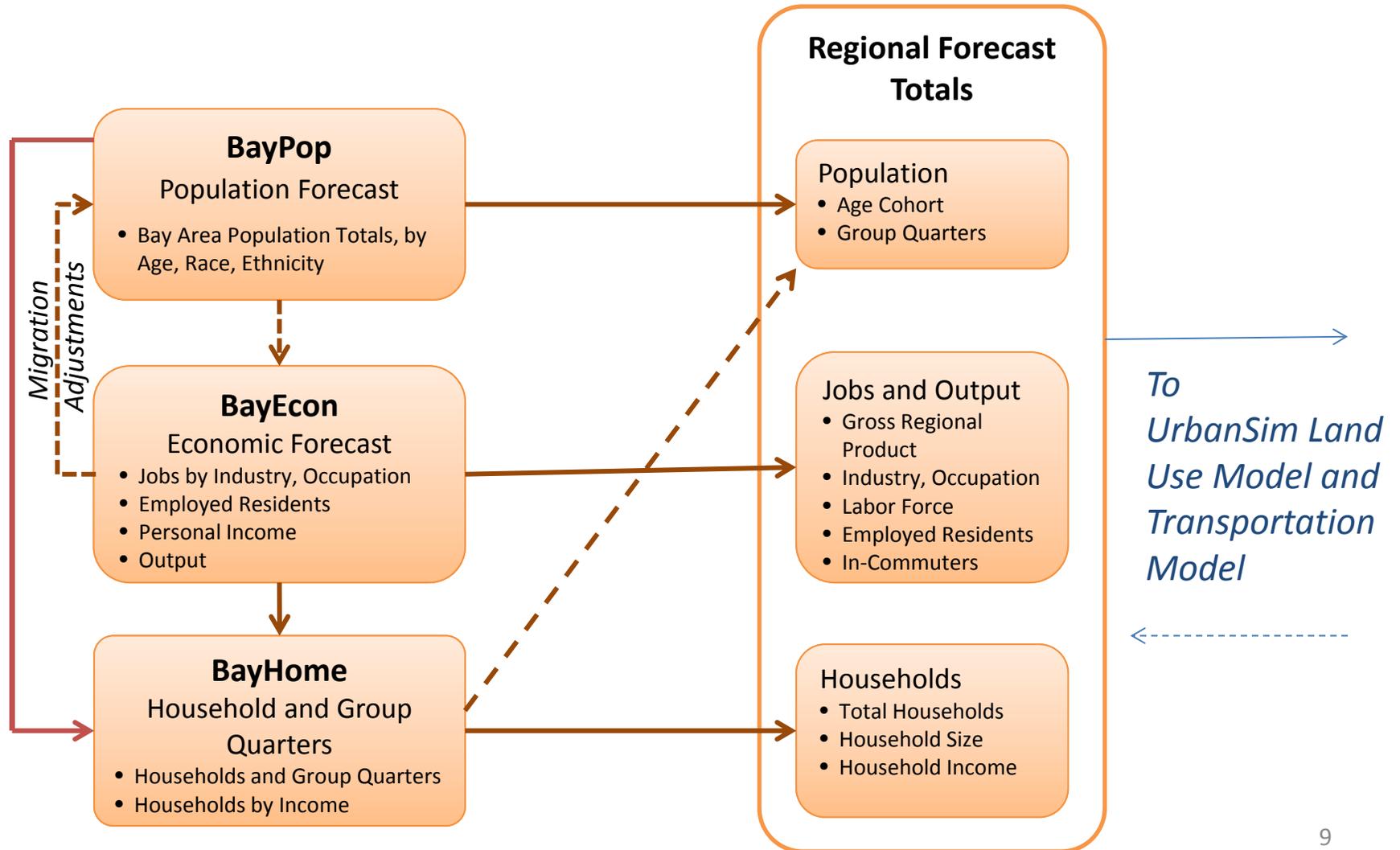
	Proposed SCS 2017
Gross Regional Product	BayEcon (Based on REMI*)
Regional Employment	BayEcon (Based on REMI*, adjustments)
Population	BayPop (Pitkin Myers Cohort-Survival/ Migration Model*)
Households and Housing Units	BayHome (ABAG) and UrbanSim (ABAG and MTC)
Occupations	BayEcon (Based on REMI*)
Income	BayEcon and BayHome
Distribution at the subregional level	BayEcon; Predictive equations by County or Jurisdiction**
Distribution at the small zone/parcel level	UrbanSim (MTC Analysis and Modeling Group) with Land Use Input from ABAG
<p>* With adjustments to reflect Bay Area specialized economic characteristics; econometric verification. ** Developed through iterative process to maintain consistency with Urban Sim approach.</p>	

ABAG/MTC Regional Forecasting Process



Regional Forecasting Model

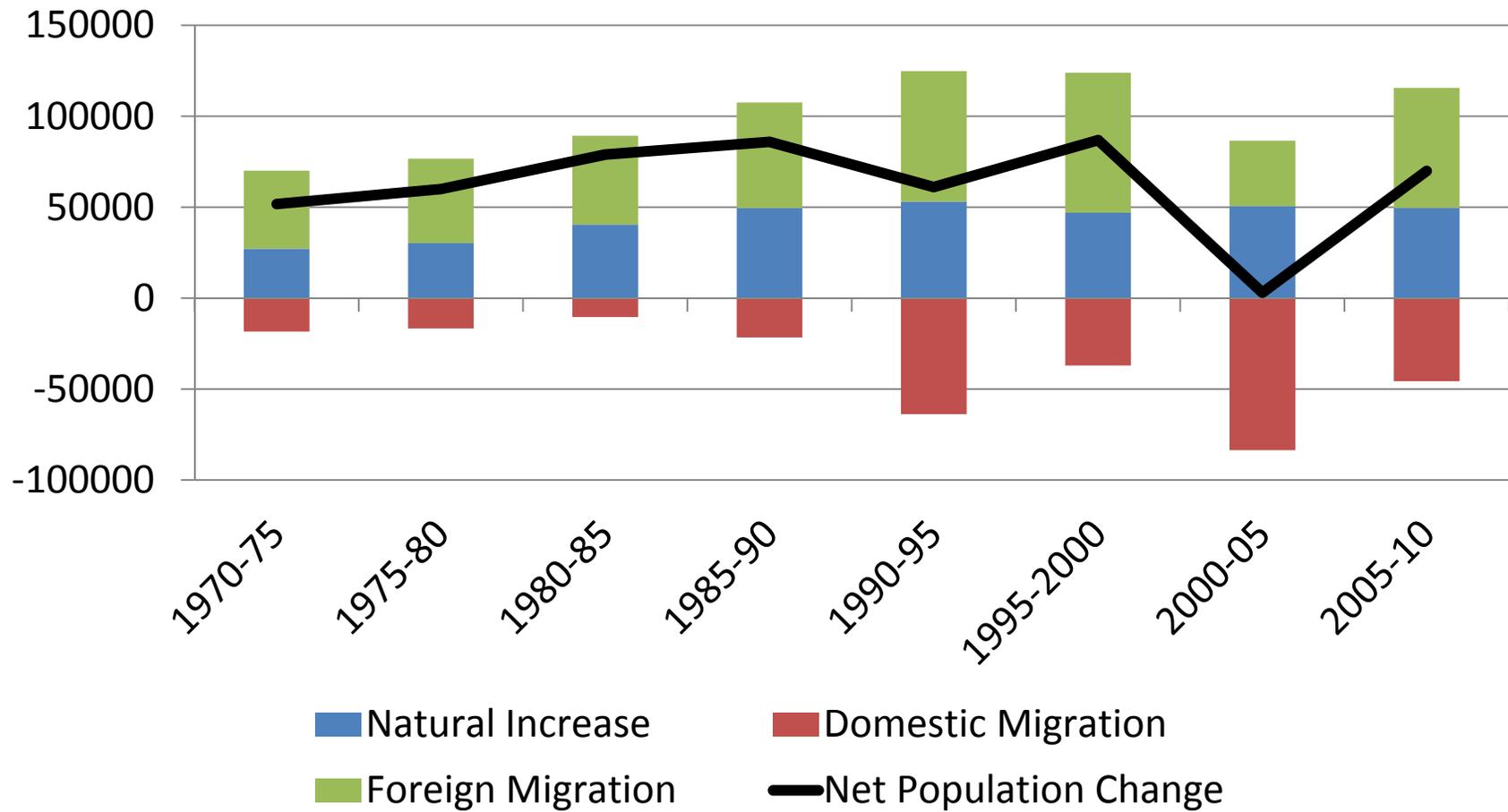
Stage 1 – Population, Economic and Household Regional Totals



BayPop: Demographic Component of the ABAG Regional Forecast

- Theoretical basis from John Pitkin and Professor Dowell Myers (USC)
- Cohort-Survival model with migration patterns drawn from past experience
- Natural increase sensitive to ethnicity, country of origin, and age structure of the population
- Migration sensitive to age, place of birth and broad assumptions about economic activity.

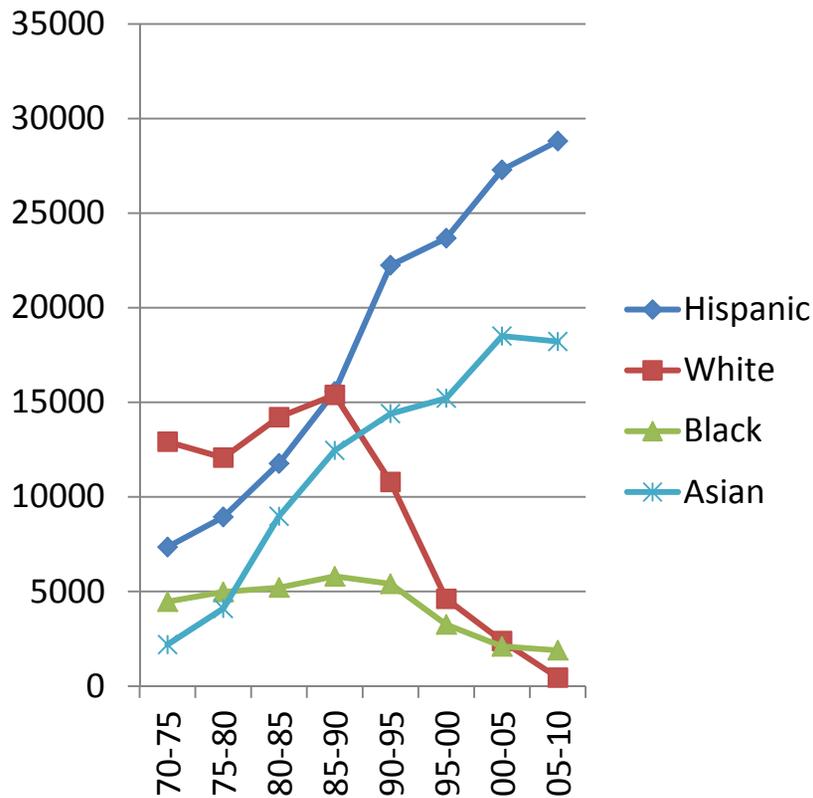
Historic Components of Population Growth



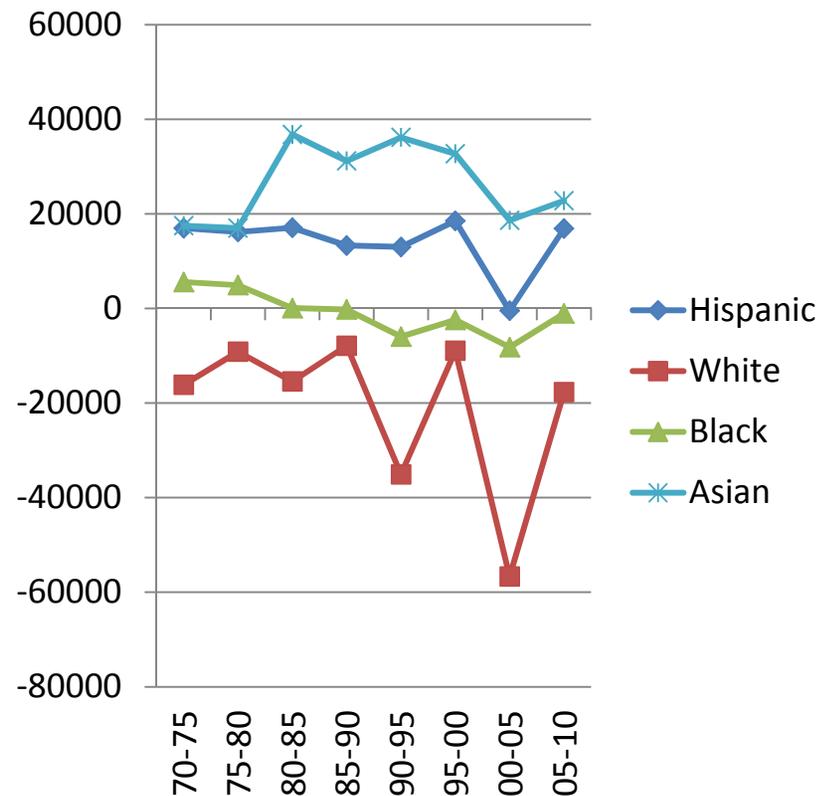
Source: ABAG from Pitkin-Myers analysis.

Population Changes by Ethnicity

Bay Area Natural Increase



Bay Area Net Migration



Source: Pitkin-Meyers analysis

BayEcon: Economic Component of ABAG Regional Forecast

- Built using the REMI model
 - Many statistical equations link related factors
 - Includes CGE, econometric, I-O and economic geography components.
 - Models Bay Area in the context of the national economy, statewide interactions, subregions.
 - Can test sensitivity to assumptions
- Compare results to alternative methodologies

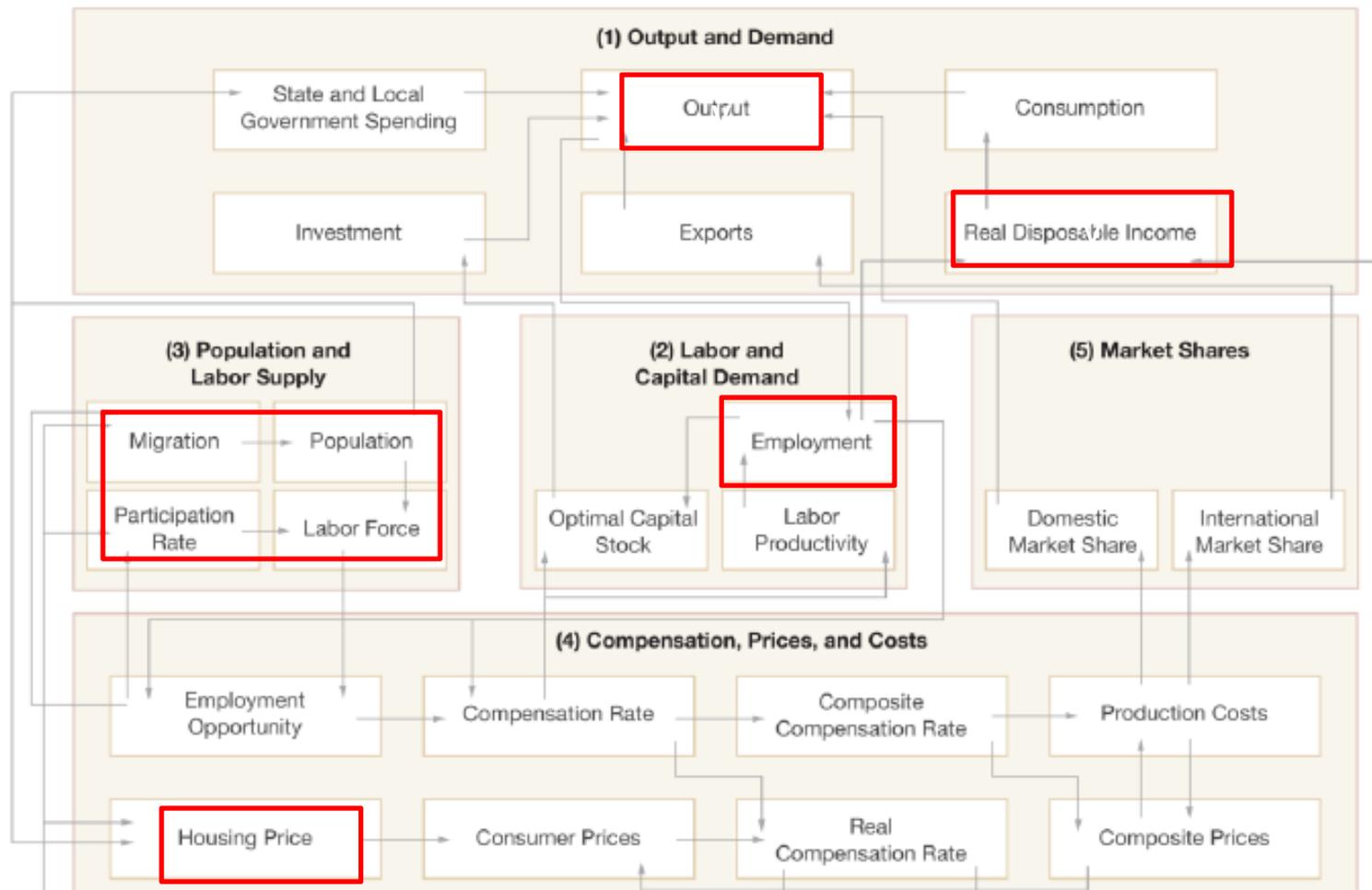
Remi Components

Figure 1: REMI Model Linkages

REMI Model Linkages (Excluding Economic Geography Linkages)



[Economic Geography Linkages; Commodities access index, labor access index]

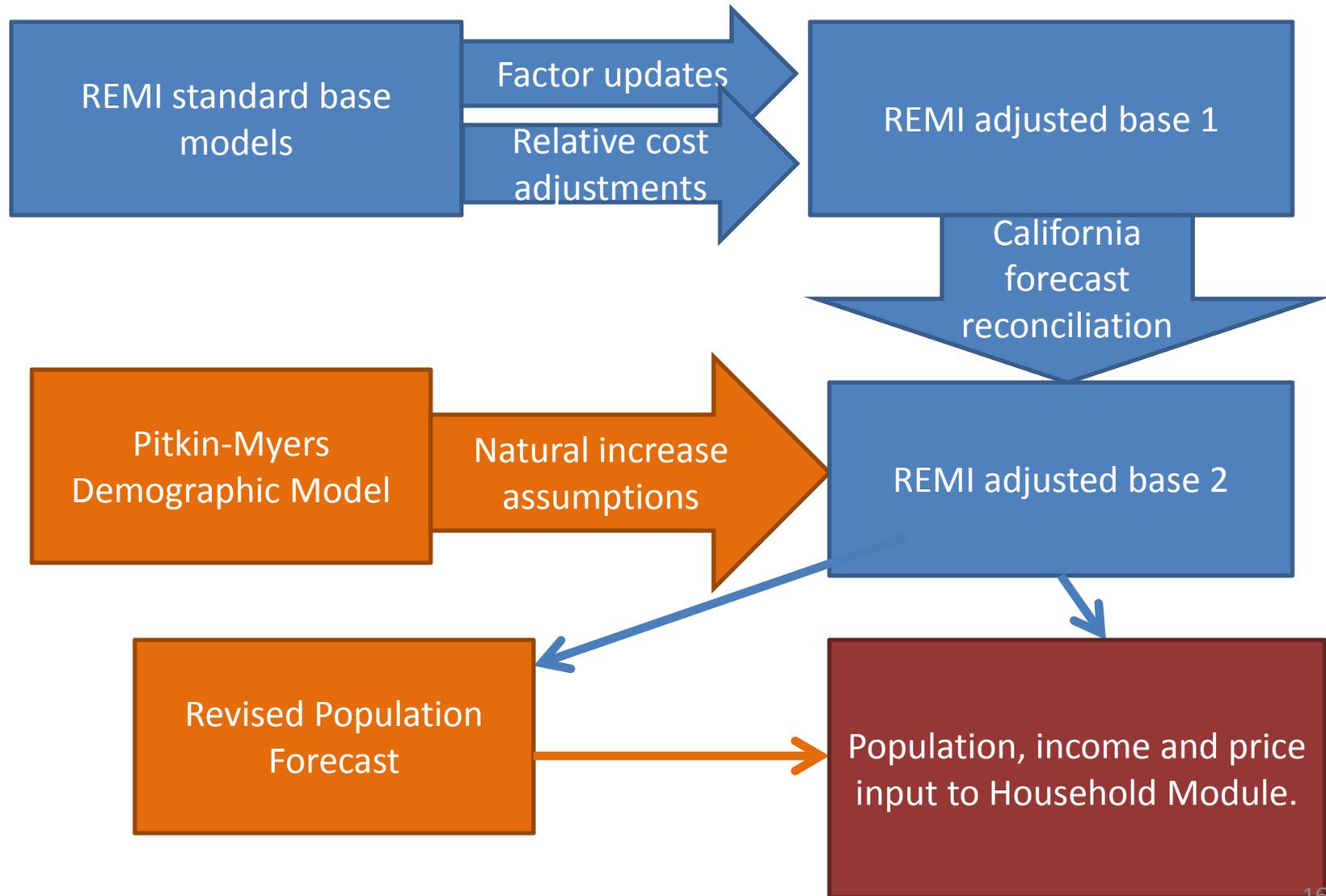


Source: REMI Model Equations, 2012

REMI Model Outputs for the Forecast

- REMI Output
 - Gross regional product
 - Total income
 - Employment by industrial sector
 - Labor force, labor force participation rate
 - Population and migration
- ABAG Adjustments
 - Pitkin-Myers population model
 - Definition of employment
 - Income categories

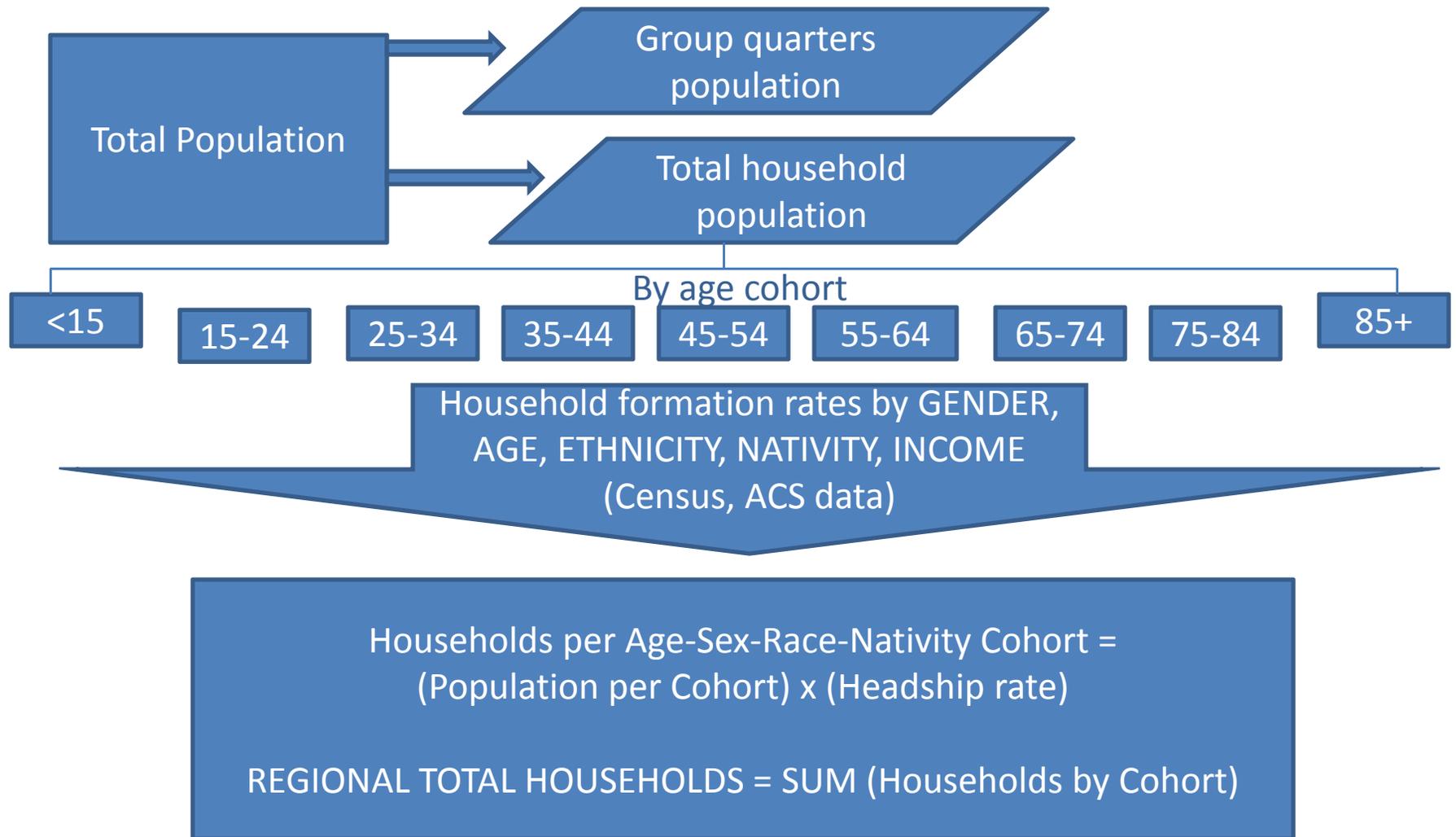
REMI/P-M Adjustment Cycle



BayHome: Housing Market Component of Forecast

- Translate BayPop and BayEcon output on population, jobs and income to group quarters population and to households by income category
- Household formation (headship rates, price effects) tied to BayPop and BayEcon demographic and economic results
- Housing construction
 - Value of investment from BayEcon (REMI)
 - Local policies, market analysis from UrbanSim

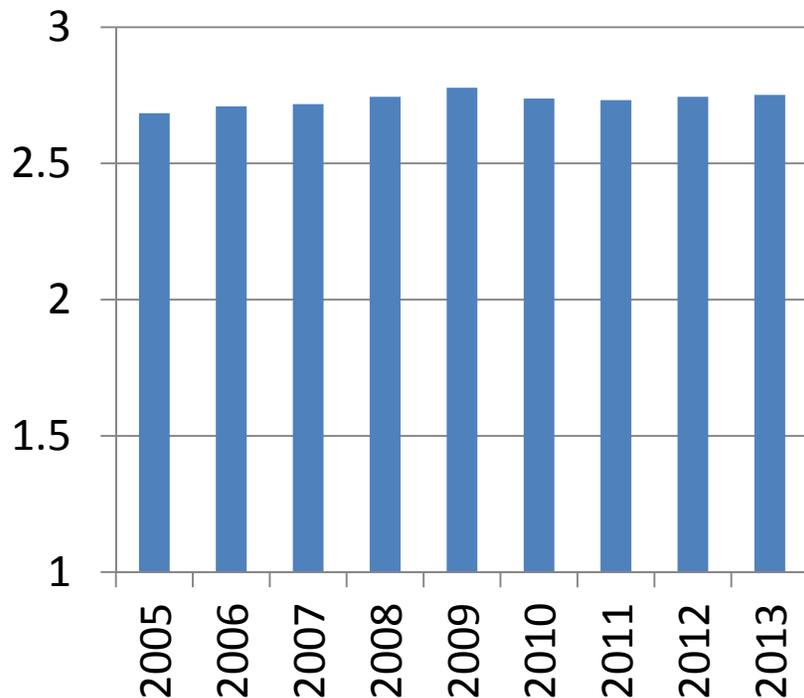
Household Formation Process



Household Size is not Exogenous

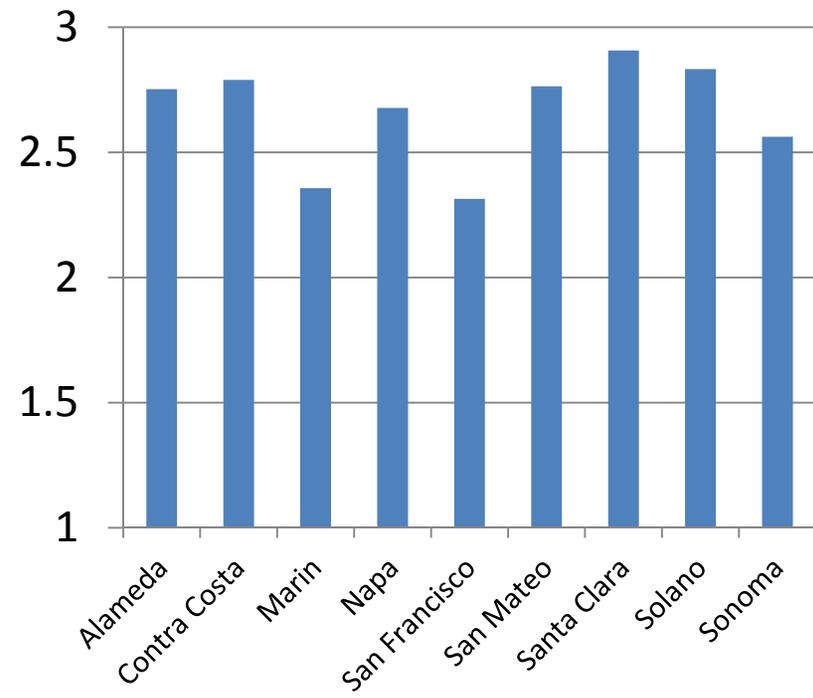
Bay Area Household Size

Persons per Household



Household Size by County

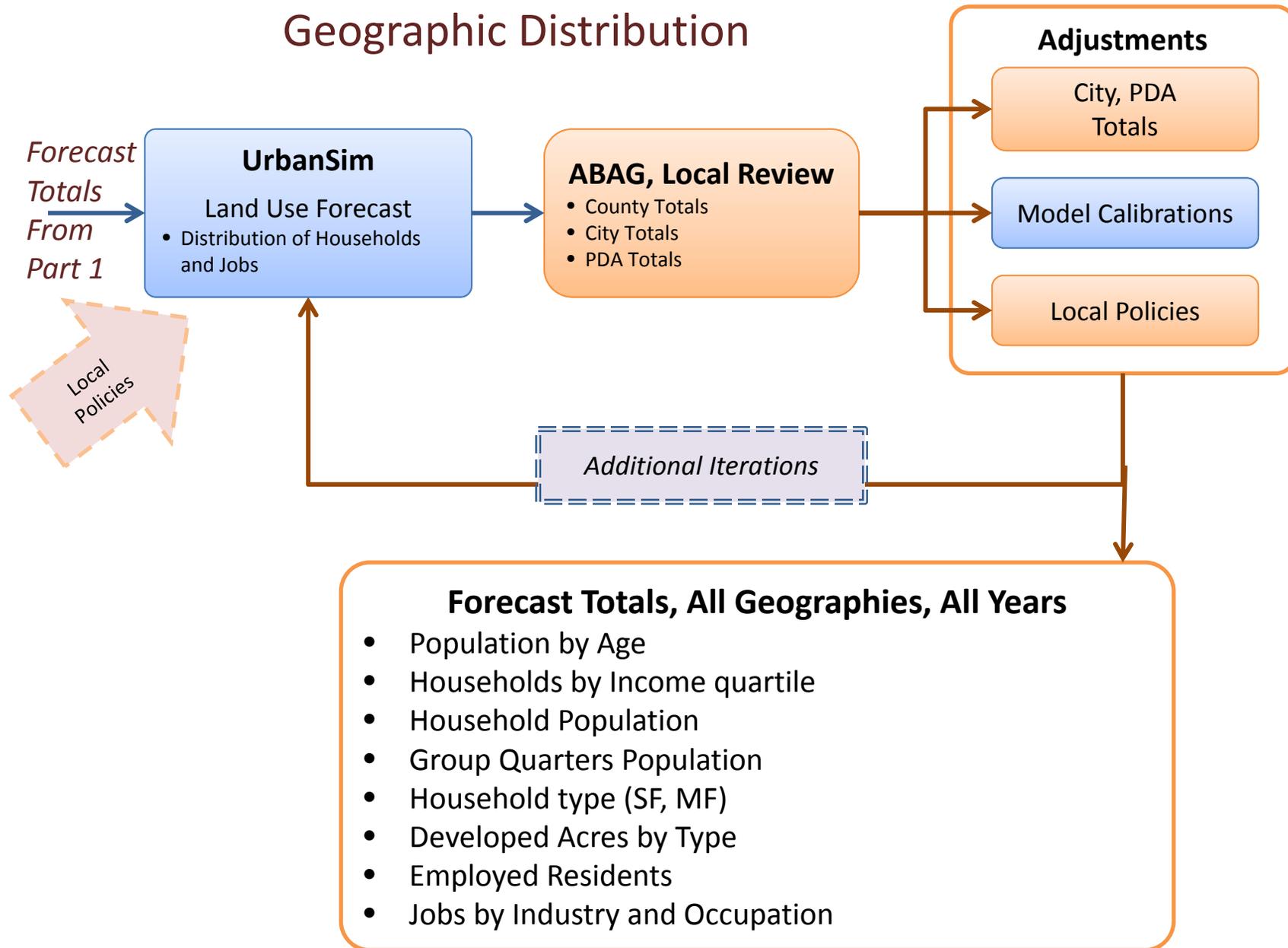
5 Year Average—2012 ACS



Source: ABAG from American Community Survey. Chart on left is from the 1 year data, chart on the right is from the 2012 5-year data.

Part 2 – Land Use Model:

Geographic Distribution



Progress to Date and Next Steps

- Initial runs for population and economic forecast runs completed in 2014
- Technical Advisory Committee established, met in September, November 2014
- Collaboration with COGS and CARB on commutes begun Q4 2014
- Household module design underway, estimates beginning Q1 2015
- To come:
 - Income estimates (beginning Q1 or Q2 2015)
 - Geographic distribution to jurisdictions (Q2 2015)
 - Recalibrations and adjustments (Q3 2015)
 - Small zone distribution, working regional totals (Q4 2015)

Oversight

- Technical Peer Review Committee—12 members + 3 ex-officio members (public sector, private sector, think tank, academia)
- Policy review (RPC and RAWG)
- Regional agency governing body oversight (ABAG Exec Board)

Thank You