Appendix A: Alternative Forecast Scenarios

Uncertainty exists in all industries, but especially in the commercial air travel industry. As volatility in the global environment has increased, the importance of scenarios for planning purposes has increased. In order to help stakeholders better prepare for the future, the FAA has provides alternative scenarios to our baseline forecasts of airline traffic and capacity.

To create the baseline domestic forecast, economic assumptions from IHS Global Insight's 10-year and 30-year U.S. Macro Baselines were used. To develop the alternative scenarios, assumptions from IHS Global Insight's 10-year optimistic and pessimistic forecasts from their January 2017 Baseline U.S. Economic Outlook were combined with the optimistic and pessimistic forecasts from their Fall 2016 30-year U.S. Macro forecast. Inputs from these alternative scenarios were used to create a "high" and "low" traffic, capacity, and yield forecast.

International passengers and traffic are primarily driven by country specific Gross Domestic Product (GDP) forecasts provided by IHS Global Insight. Thus, the alternative scenarios use inputs based on ratios derived from IHS Global Insight's Major Trading Partner and Minor Trading Partners optimistic and pessimistic forecasts in order to create a high and low case.

Scenario Assumptions

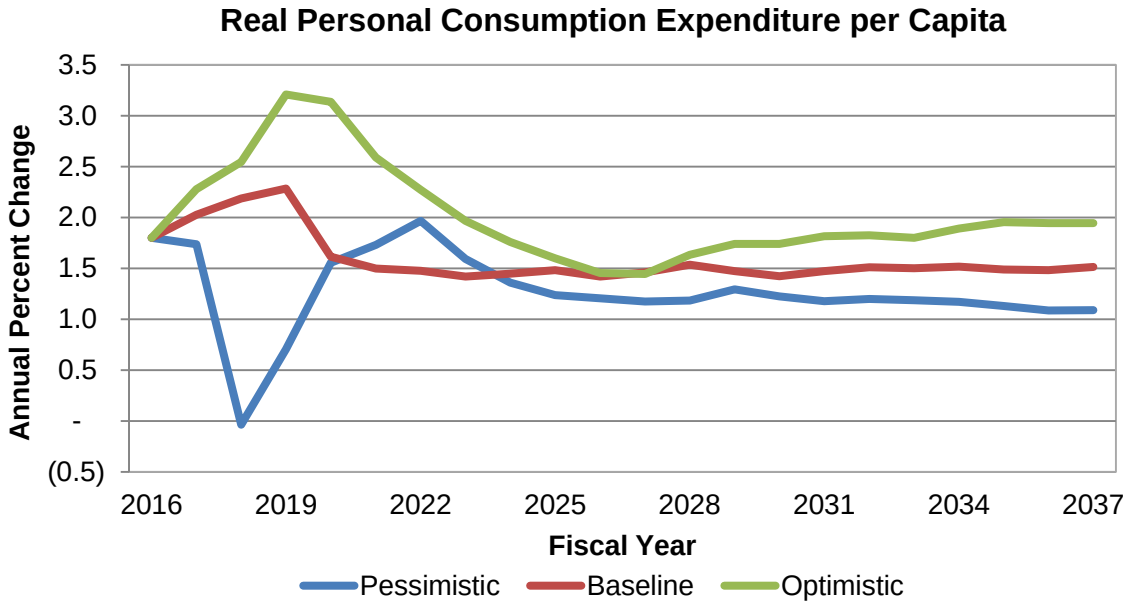
The FAA's domestic baseline forecast assumes that the economy experiences a pickup in growth over the next few years as a result of tax cuts and higher infrastructure spending. Oil prices remain low by historic standards and there are no financial sector collapses.

The FAA's high case forecast uses IHS Global Insight's optimistic forecast. The optimistic forecast sees a rollback in regulations and lower corporate taxes resulting in higher capital spending. Stronger growth in investment spending leads to a boost in productivity and raises economic growth above the baseline case. Given the strengthening outlook, both business and consumer confidence improve leading to robust consumer spending with the housing sector remaining an engine of growth. Continuing oversupply in oil markets keep oil prices low. Inflation remains in check with higher productivity, lower oil prices, and higher interest rates than in the baseline case. In this scenario real personal consumption expenditure (PCE) per capita growth averages 0.4 percentage points faster per year than the baseline forecast and unemployment averages 0.3 points lower on a fiscal year basis than the baseline.[7]

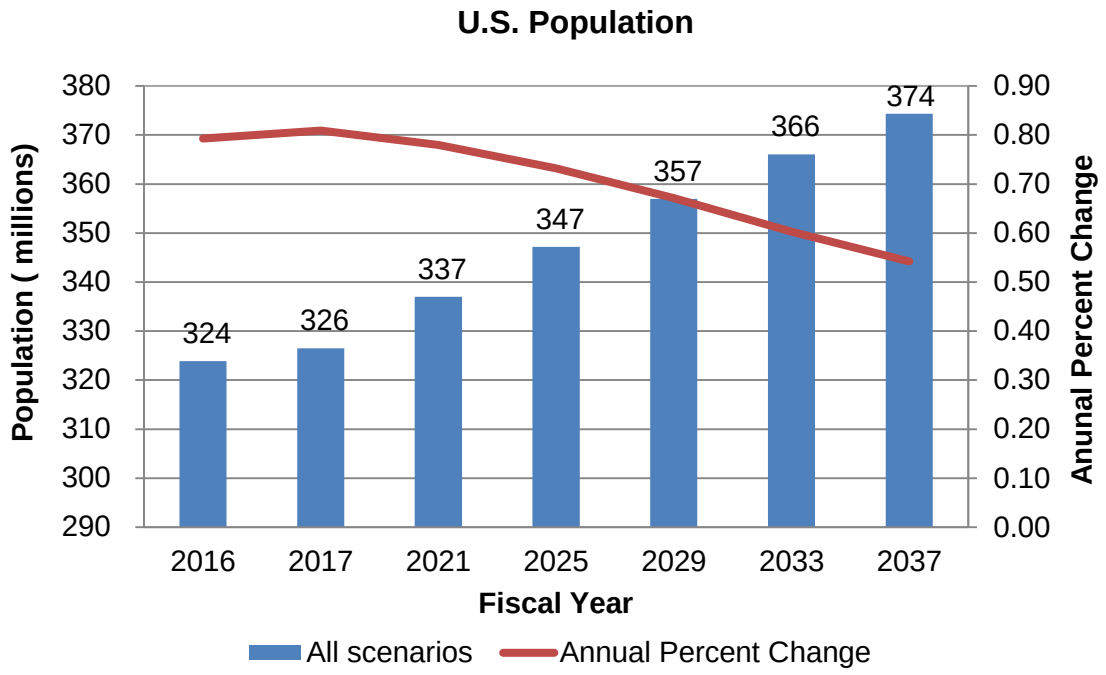
Conversely, FAA's low case forecast uses IHS Global Insight's pessimistic scenario. In this forecast, strained relations with major trading partners fuels uncertainty that causes business to cut back on investment and slows productivity growth leading to a

[7] Real personal consumption expenditure per capita and unemployment are used as an input variables to the FAA's base, high and low forecasts of enplanements.

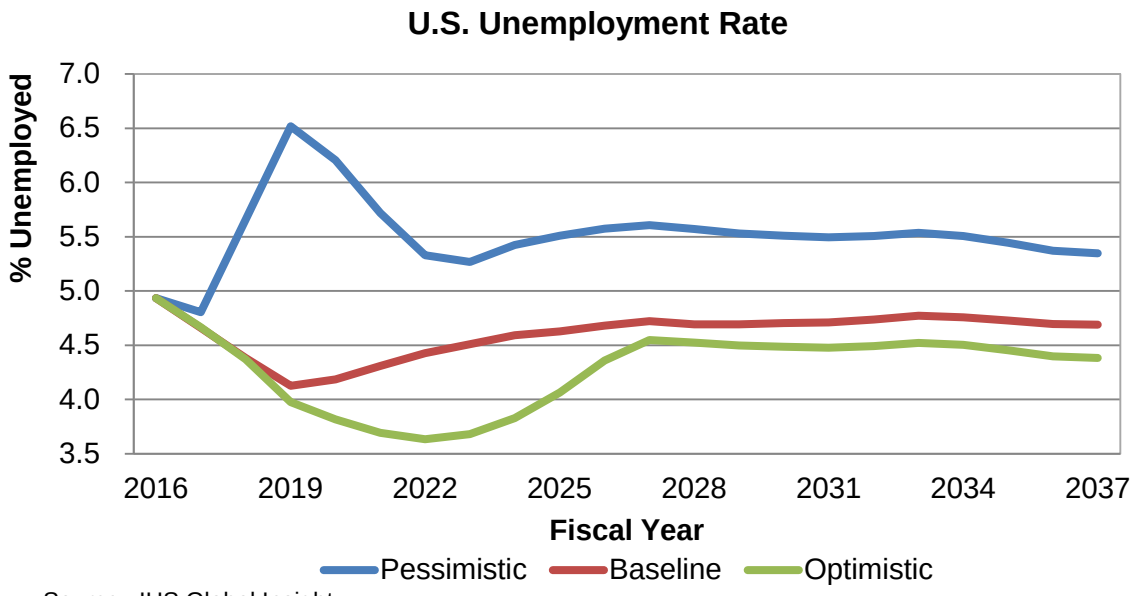
pickup in both wage and price inflation. In addition, the Eurozone's recovery will stall and growth in emerging markets will be less robust. The Federal Reserve raises interest rates to keep inflation in check but business and consumer confidence deteriorate. The combination of higher inflation, higher interest rates, and uncertainty negatively impact consumer spending, the housing market, and business investment, and the U.S. economy suffers a shallow recession in 2018 and the unemployment rate peaks at 6.6%. The Federal Reserve responds by slashing interest rates which spurs a recovery in 2019. In the long run, compared to the baseline forecast, productivity growth remains subdued, oil prices are higher, and economic growth is slower. Real PCE per capita in this scenario grows 0.4 percentage points slower per year than in the baseline; and unemployment, on average, is 0.9 points higher on an annual basis than in the baseline.



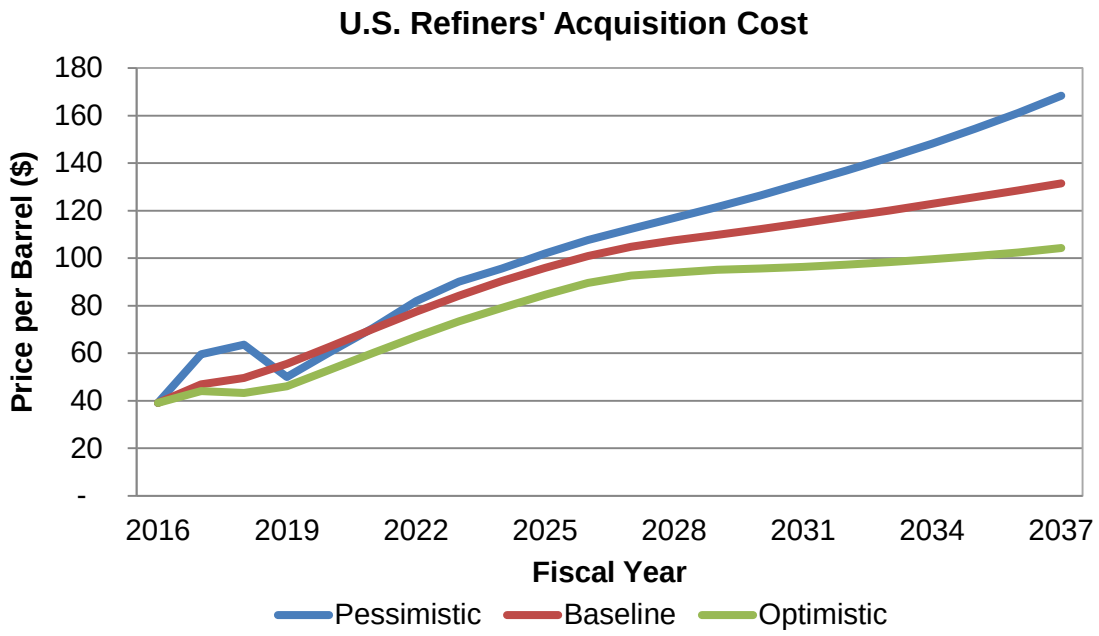
Source: IHS Global Insight



Source: IHS Global Insight

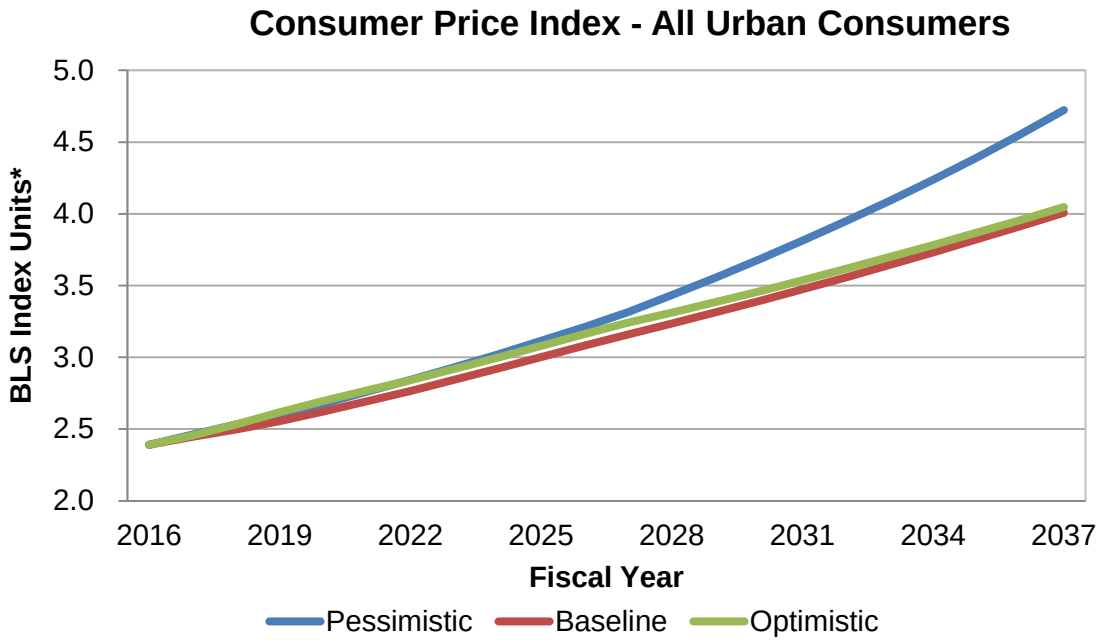


Source: IHS Global Insight



Source: IHS Global Insight

The price of energy is one of the drivers in the growth of consumer prices over the forecast period. In the optimistic case, energy prices and import prices grow more slowly than in the baseline. In the pessimistic case the opposite occurs with energy prices, wages and import prices rising more rapidly compared to the baseline.



* BLS Units: 1982-84 = 1.00
Source: IHS Global Insight

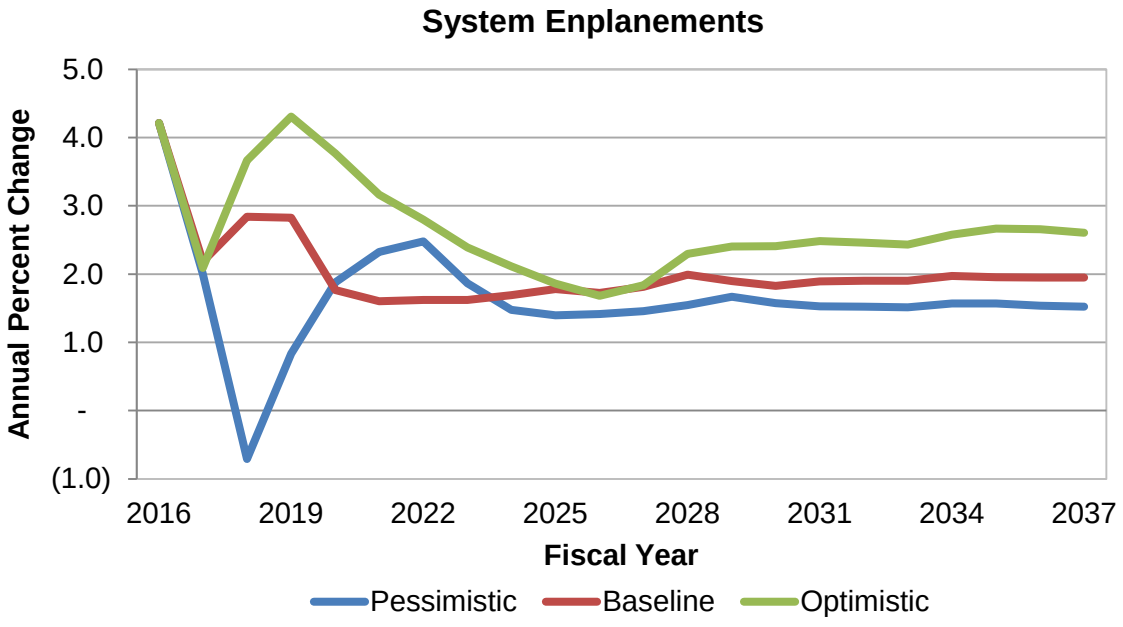
Alternative Forecasts

Enplanements

In the baseline forecast, system enplanements are forecast to grow at an average annual rate of 1.9 percent a year over the forecast horizon of 2017-2037 (with domestic and international passengers up 1.7 and 3.5 percent, respectively).

In the optimistic case, enplanements grow at a quicker pace, averaging 2.6 percent per year (up 2.3 percent domestically and 4.7 percent internationally). This scenario is marked by a more favorable business environment, and lower fuel prices which make the price of flying more affordable to business and leisure travelers. By the end of the forecast period in 2037, system passengers in the optimistic case are 14.6 percent above the baseline, totaling 1.4 billion, 179 million greater than in the baseline.

The pessimistic case is characterized by a period of weakened consumer confidence brought on by persistent unemployment, low consumer demand, and higher inflation. In this scenario enplanements grow an average of 1.5 percent per year (domestic up 1.3 percent and international up 3.0 percent). In the pessimistic case, system passengers in 2037 are 8.3 percent below the baseline case, totaling 1.125 billion, 101 million fewer than in the baseline.

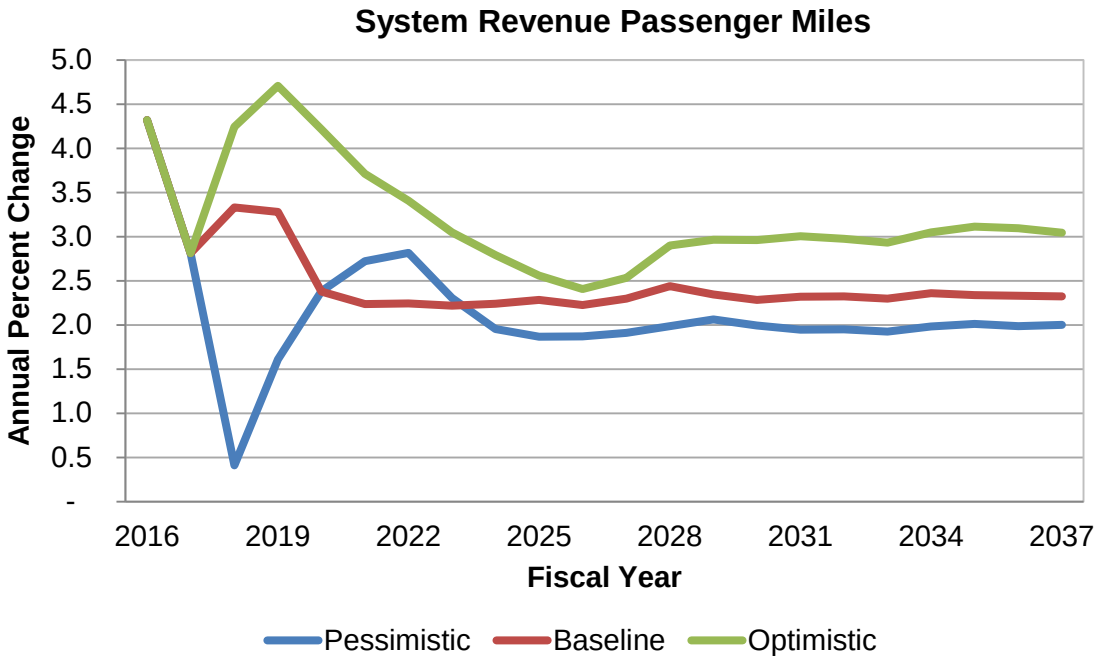


Revenue Passenger Miles

In the baseline forecast, system RPMs grow at an average annual rate of 2.4 percent a year over the forecast horizon (2017-2037), with domestic RPMs increasing 2.0 percent annually and international RPMs growing 3.4 percent annually.

In the optimistic case, the faster growing economy coupled with lower energy prices drives RPMs higher than the baseline, with growth averaging 3.2 percent per year (domestic and international RPMs up 2.6 and 4.5 percent, respectively).

In the pessimistic case, the combination of a slower growing economy and higher energy prices result in RPM growth averaging 2.0 percent annually with domestic markets growing 1.5 percent a year while international traffic grows 3.0 percent annually.



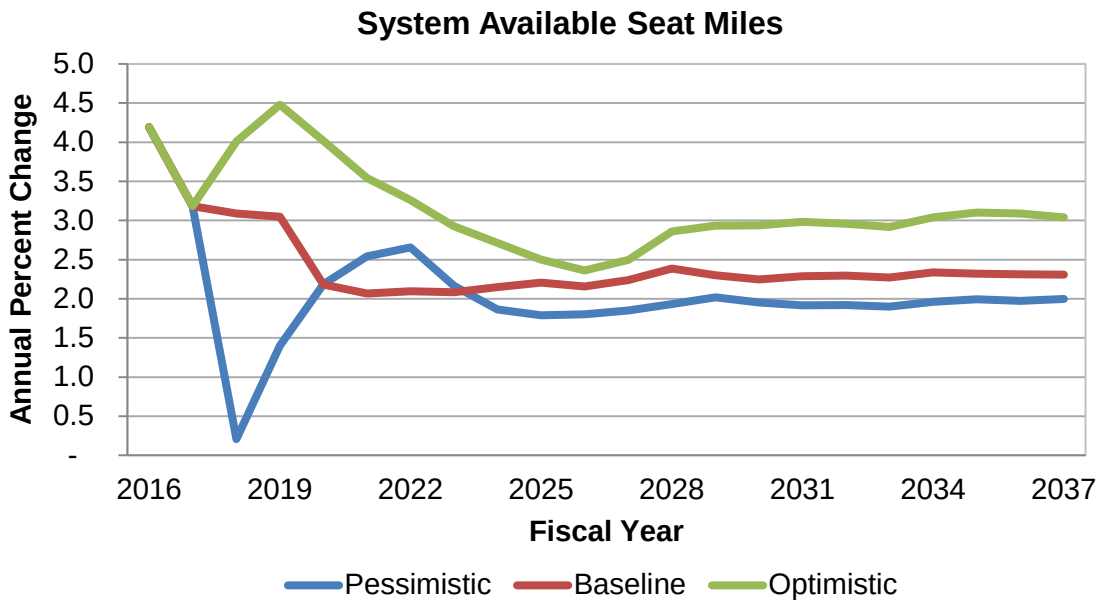
Available Seat Miles

In the base case, system capacity is forecast to increase an average of 2.3 percent annually over the forecast horizon with growth averaging 1.8 percent annually in domestic markets and 3.4 percent a year in international markets.

In the optimistic case, capacity grows at a faster clip than in the baseline forecast, averaging 3.1 percent annually system-wide (2.4 and 4.5 percent for domestic and international markets, respectively). Carriers increase capacity compared to the baseline forecast to accommodate increased travel

demand brought about by a more favorable economic environment.

In the pessimistic case, demand for air travel is lower than in the baseline, thus system capacity grows at a slower pace of 1.9 percent annually (domestic growth of 1.4 percent annually and international up 2.9 percent annually).



Load Factor

System load factors over the 20-year forecast period are relatively similar for all three forecast scenarios. System load factor rises from 83.2 percent in 2017 to 84.4 (optimistic), 84.5 (pessimistic), and 84.6 (baseline) percent in 2037, respectively.

In all three scenarios it is assumed that carriers will keep load factors on the high side by actively managing capacity (seats) to more precisely meet demand (passengers).

The domestic load factor increases over the forecast horizon from 84.1 percent to 86.3 percent in the optimistic and pessimistic scenarios, respectively, while rising to 86.4 percent in the baseline.

The international load factor is forecast to rise gradually from 80.9 in 2016 to 81.2 percent in 2037 in the optimistic scenario and 81.3 percent in the baseline and pessimistic scenarios. This reflects in part the relative growth in demand and capacity in the three (Atlantic, Latin, and Pacific) international regions under each scenario.

Yield

In the baseline forecast, nominal system yield increases 2.1 percent annually, going from 13.56 cents in 2017 to 20.38 cents in 2037. In domestic markets, yield in the baseline forecast rises from 13.76 cents in 2017 to 21.16 cents in 2037. International yield rises from 13.04 cents in 2017 to 18.89 cents in 2037.

System yield rises in the optimistic case at the same rate as in the baseline, up 2.1 percent annually to 20.46 cents by 2037. Domestic yield increases to 21.33 cents while international yield increases to 18.95 cents. The modest growth in yield in both cases is due to advancements in technology, gains in productivity, and relatively favorable fuel prices.

In the pessimistic case, nominal yields rise more rapidly than in the baseline, growing an average of 2.6 percent annually, reaching 22.62 cents by 2037 (24.55 cents domestically and 18.90 cents internationally). This scenario reflects higher general domestic inflation and higher energy prices than in the baseline, forcing carriers to increase fares in order to cover the higher costs of fuel, labor, and capital.

TABLE A-1

FAA FORECAST ECONOMIC ASSUMPTIONS

FISCAL YEARS 2016-2037

Variable	Scenario	Historical	FORECAST					PERCENT AVERAGE ANNUAL GROWTH				
		2016E	2017	2022	2027	2032	2037	2016-17	2017-22	2017-27	2017-32	2017-37
Economic Assumptions												
Real Personal Consumption	Pessimistic	35,306	35,920	38,095	40,668	43,201	45,708	1.7%	1.2%	1.2%	1.2%	1.2%
Expenditure per Capita	Baseline	35,306	36,022	39,406	42,339	45,575	49,102	2.0%	1.8%	1.6%	1.6%	1.6%
(2009 $)	Optimistic	35,306	36,111	41,359	44,874	48,946	53,798	2.3%	2.8%	2.2%	2.0%	2.0%
Refiners Acquisition Cost -	Pessimistic	39.1	59.5	81.9	112.3	136.9	168.3	52.2%	6.6%	6.6%	5.7%	5.3%
Average - $ Per Barrel	Baseline	39.1	46.9	77.4	104.8	117.4	131.4	19.8%	10.6%	8.4%	6.3%	5.3%
	Optimistic	39.1	44.0	67.0	92.6	97.3	104.2	12.6%	8.7%	7.7%	5.4%	4.4%
Consumer Price Index	Pessimistic	2.39	2.46	2.84	3.32	3.95	4.72	3.0%	2.9%	3.0%	3.2%	3.3%
All Urban, 1982-84 = 1.0	Baseline	2.39	2.45	2.77	3.16	3.56	4.01	2.4%	2.5%	2.6%	2.5%	2.5%
	Optimistic	2.39	2.45	2.84	3.25	3.65	4.12	2.7%	3.0%	2.8%	2.7%	2.6%
Civilian Unemployment Rate	Pessimistic	4.9	4.8	5.3	5.6	5.5	5.3	-2.6%	2.1%	1.6%	0.9%	0.5%
(%)	Baseline	4.9	4.7	4.4	4.7	4.7	4.7	-5.6%	-1.0%	0.1%	0.1%	0.0%
	Optimistic	4.9	4.7	3.6	4.5	4.5	4.4	-5.4%	-4.9%	-0.3%	-0.3%	-0.3%

Source: IHS Global Insight

TABLE A-2

FAA FORECAST OF AVIATION ACTIVITY*

FISCAL YEARS 2016-2037

Variable	Scenario	Historical	FORECAST					PERCENT AVERAGE ANNUAL GROWTH				
		2016E	2017	2022	2027	2032	2037	2016-17	2017-22	2017-27	2017-32	2017-37
System												
Aviation Activity												
Available Seat Miles	Pessimistic	1,111.6	1,147.0	1,253.7	1,377.0	1,516.5	1,671.5	3.2%	1.8%	1.8%	1.9%	1.9%
(BIL)	Baseline	1,111.6	1,147.0	1,297.4	1,444.2	1,618.4	1,814.2	3.2%	2.5%	2.3%	2.3%	2.3%
	Optimistic	1,111.6	1,147.0	1,386.2	1,575.9	1,821.1	2,115.0	3.2%	3.9%	3.2%	3.1%	3.1%
Revenue Passenger Miles	Pessimistic	928.0	954.1	1,052.5	1,161.0	1,281.1	1,413.0	2.8%	2.0%	2.0%	2.0%	2.0%
(BIL)	Baseline	928.0	954.1	1,089.6	1,217.9	1,367.4	1,534.3	2.8%	2.7%	2.5%	2.4%	2.4%
	Optimistic	928.0	954.1	1,163.8	1,327.6	1,536.1	1,784.8	2.8%	4.1%	3.4%	3.2%	3.2%
Enplanements	Pessimistic	819.6	836.0	894.2	964.4	1,042.4	1,125.3	2.0%	1.4%	1.4%	1.5%	1.5%
(MIL)	Baseline	819.6	837.5	930.6	1,013.8	1,114.0	1,226.6	2.2%	2.1%	1.9%	1.9%	1.9%
	Optimistic	819.6	836.8	995.7	1,098.0	1,236.9	1,405.5	2.1%	3.5%	2.8%	2.6%	2.6%
Psgr Carrier Miles Flown	Pessimistic	7,346.0	7,518.2	7,950.6	8,534.8	9,210.2	9,948.0	2.3%	1.1%	1.3%	1.4%	1.4%
(MIL)	Baseline	7,346.0	7,518.2	8,243.3	8,953.6	9,827.0	10,808.4	2.3%	1.9%	1.8%	1.8%	1.8%
	Optimistic	7,346.0	7,518.2	8,824.1	9,753.8	11,017.2	12,539.2	2.3%	3.3%	2.6%	2.6%	2.6%
Psgr Carrier Departures	Pessimistic	9,058.2	9,280.0	9,506.1	9,946.0	10,359.4	10,816.9	2.4%	0.5%	0.7%	0.7%	0.8%
(000s)	Baseline	9,058.2	9,289.8	9,893.8	10,443.6	11,053.0	11,778.2	2.6%	1.3%	1.2%	1.2%	1.2%
	Optimistic	9,058.2	9,284.7	10,597.9	11,297.6	12,239.2	13,445.5	2.5%	2.7%	2.0%	1.9%	1.9%
Nominal Passenger Yield	Pessimistic	13.44	13.61	15.35	17.46	19.85	22.62	1.3%	2.4%	2.5%	2.5%	2.6%
(cents)	Baseline	13.44	13.55	15.29	17.14	18.69	20.38	0.9%	2.4%	2.4%	2.2%	2.1%
	Optimistic	13.44	13.59	15.47	17.35	18.82	20.46	1.1%	2.6%	2.5%	2.2%	2.1%

* Includes domestic and international activity.

TABLE A-3

FAA FORECAST OF DOMESTIC AVIATION ACTIVITY

FISCAL YEARS 2016-2037

		Historical	FORECAST					PERCENT AVERAGE ANNUAL GROWTH				
Variable	Scenario	2016E	2017	2022	2027	2032	2037	2016-17	2017-22	2017-27	2017-32	2017-37
Domestic Aviation Activity												
Available Seat Miles	Pessimistic	783.0	813.3	859.8	924.4	999.1	1,076.9	3.9%	1.1%	1.3%	1.4%	1.4%
(BIL)	Baseline	783.0	813.3	894.3	968.0	1,061.7	1,168.5	3.9%	1.9%	1.8%	1.8%	1.8%
	Optimistic	783.0	813.3	957.3	1,041.0	1,163.4	1,314.5	3.9%	3.3%	2.5%	2.4%	2.4%
Revenue Passenger Miles	Pessimistic	663.2	684.2	732.5	792.9	860.2	929.4	3.2%	1.4%	1.5%	1.5%	1.5%
(BIL)	Baseline	663.2	684.2	762.2	830.7	914.7	1,009.2	3.2%	2.2%	2.0%	2.0%	2.0%
	Optimistic	663.2	684.2	815.6	892.9	1,001.7	1,134.4	3.2%	3.6%	2.7%	2.6%	2.6%
Enplanements	Pessimistic	726.2	741.9	783.6	836.8	895.8	955.0	2.2%	1.1%	1.2%	1.3%	1.3%
(MIL)	Baseline	726.2	741.9	815.3	876.7	952.6	1,037.0	2.2%	1.9%	1.7%	1.7%	1.7%
	Optimistic	726.2	741.9	872.5	942.4	1043.1	1,165.7	2.2%	3.3%	2.4%	2.3%	2.3%
Psgr Carrier Miles Flown	Pessimistic	5,815.9	5,971.2	6,140.9	6,471.5	6,869.1	7,277.4	2.7%	0.6%	0.8%	0.9%	1.0%
(MIL)	Baseline	5,815.9	5,971.2	6,389.6	6,779.0	7,302.7	7,900.6	2.7%	1.4%	1.3%	1.4%	1.4%
	Optimistic	5,815.9	5,971.2	6,842.5	7,293.0	8,005.7	8,892.1	2.7%	2.8%	2.0%	2.0%	2.0%
Psgr Carrier Departures	Pessimistic	8,391.5	8,613.7	8,740.4	9,080.1	9,379.9	9,692.4	2.6%	0.3%	0.5%	0.6%	0.6%
(000s)	Baseline	8,391.5	8,613.7	9,095.4	9,512.8	9,973.5	10,524.3	2.6%	1.1%	1.0%	1.0%	1.0%
	Optimistic	8,391.5	8,613.7	9,740.9	10,234.8	10,934.5	11,846.1	2.6%	2.5%	1.7%	1.6%	1.6%
Nominal Passenger Yield	Pessimistic	13.68	13.84	15.81	18.20	21.09	24.55	1.2%	2.7%	2.8%	2.8%	2.9%
(cents)	Baseline	13.68	13.76	15.71	17.74	19.37	21.16	0.6%	2.7%	2.6%	2.3%	2.2%
	Optimistic	13.68	13.81	15.96	18.06	19.60	21.33	0.9%	2.9%	2.7%	2.4%	2.2%

TABLE A-4

FAA FORECAST OF INTERNATIONAL AVIATION ACTIVITY*

FISCAL YEARS 2016-2037

Variable	Scenario	Historical	FORECAST					PERCENT AVERAGE ANNUAL GROWTH				
		2016E	2017	2022	2027	2032	2037	2016-17	2017-22	2017-27	2017-32	2017-37
International Aviation Activity												
Available Seat Miles	Pessimistic	328.6	333.7	394.0	452.6	517.4	594.6	1.5%	3.4%	3.1%	3.0%	2.9%
(BIL)	Baseline	328.6	333.7	403.1	476.3	556.6	645.6	1.5%	3.9%	3.6%	3.5%	3.4%
	Optimistic	328.6	333.7	428.8	534.9	657.7	800.5	1.5%	5.1%	4.8%	4.6%	4.5%
Revenue Passenger Miles	Pessimistic	264.8	269.8	320.0	368.1	420.8	483.7	1.9%	3.5%	3.2%	3.0%	3.0%
(BIL)	Baseline	264.8	269.8	327.4	387.3	452.7	525.1	1.9%	3.9%	3.7%	3.5%	3.4%
	Optimistic	264.8	269.8	348.2	434.7	534.4	650.4	1.9%	5.2%	4.9%	4.7%	4.5%
Enplanements	Pessimistic	93.4	94.1	110.7	127.5	146.6	170.3	0.7%	3.3%	3.1%	3.0%	3.0%
(MIL)	Baseline	93.4	95.6	115.3	137.1	161.4	189.6	2.3%	3.8%	3.7%	3.6%	3.5%
	Optimistic	93.4	94.9	123.2	155.6	193.8	239.8	1.5%	5.4%	5.1%	4.9%	4.7%
Psgr Carrier Miles Flown	Pessimistic	1,530.1	1,546.9	1,809.7	2,063.3	2,341.1	2,670.6	1.1%	3.2%	2.9%	2.8%	2.8%
(MIL)	Baseline	1,530.1	1,546.9	1,853.7	2,174.6	2,524.3	2,907.8	1.1%	3.7%	3.5%	3.3%	3.2%
	Optimistic	1,530.1	1,546.9	1,981.6	2,460.7	3,011.5	3,647.1	1.1%	5.1%	4.8%	4.5%	4.4%
Psgr Carrier Departures	Pessimistic	666.8	666.4	765.7	865.8	979.5	1,124.5	-0.1%	2.8%	2.7%	2.6%	2.7%
(000s)	Baseline	666.8	676.1	798.4	930.8	1,079.4	1,254.0	1.4%	3.4%	3.2%	3.2%	3.1%
	Optimistic	666.8	671.1	857.0	1,062.8	1,304.7	1,599.4	0.6%	5.0%	4.7%	4.5%	4.4%
Nominal Passenger Yield	Pessimistic	12.83	13.03	14.31	15.85	17.31	18.90	1.6%	1.9%	2.0%	1.9%	1.9%
(cents)	Baseline	12.83	13.03	14.31	15.85	17.31	18.89	1.6%	1.9%	2.0%	1.9%	1.9%
	Optimistic	12.83	13.03	14.33	15.89	17.37	18.95	1.6%	1.9%	2.0%	1.9%	1.9%

*Includes mainline and regional carriers.