## STRATEGIES for MONETARY POLICY

EDITED BY JOHN H. COCHRANE JOHN B. TAYLOR

## Index

adjusted Taylor rule, 224-25, 236 Adrian, Tobias, 76 Afonso, Gara, 182 Agarwal, R., 54 aggregate demand, 94 shocks, 327 aggregate growth, consumption and, 315 aggregate production, 313 aggregate shocks, 313 aggregate technology, 320 AIG, 307 AIT. See average inflation targeting Alphabet, 266 Altavilla, Carlo, 50 Amano, Robert, 328 Amazon, 266 American Economic Association, 2 Anbil, S., 183 Andolfatto, David, 215 Armenter, Roc, 182 asset prices, Bernanke on, 272 average inflation targeting (AIT) dovish policies and, 120-21 evaluation of, 327-28 PLT and, 331 policies, 106 Reifschneider-Williams rule and, 134, 165-66 shock absorption and, 329 static, 119-23, 129, 145, 145f Williams on, 165-66 BA rule, 229

federal funds rate and, 228f measure of, 230f performance of, 239–41 bailouts, 307 balance sheet of Federal Reserve, 159, 163, 177-78, 272, 284, 302 Plosser on, 273 uncertainty and, 272-73 balanced-approach rule, 253-54 of Federal Reserve, 223 balance-of-risk assessments, of Federal Reserve, 276-77 Ball, L., 219, 237 Banegas, A., 183 Bank of Canada, 323 Bank of Japan, 41, 79-80 Bank of New York Mellon, 185 bank profits, 91 bankruptcy, 307 Banque de France, 24 Basel requirements, 212 BEA. See Bureau of Economic Analysis Benhabib, J., 108, 114 Bernanke, Ben, 20, 36, 94, 107-9, 165, 170 on asset prices, 272 on central banks, 37-38 on QE, 272 on temporary price-level targeting, 346-47 Bitcoin, 99 Blue Chip Economic Indicators, 232f Board of Governors, on interest rate rules, 218 bonds inflation-linked, 42n8, 45 nominal, 45 price pegging program, 28-29 real, 45 Bordo, Michael, 20, 29, 71, 81, 357, 359-60 Borio, C., 175 borrowed funds, 189

breakeven inflation, 12 inflation expectations and, 46-48 synthetic, 45, 46f, 69 vanilla, 46f Bretton Woods, collapse of, 3 Brunnermeier, M. K., 49 Buiter, W. H., 36, 54 Bullard, Jim, 170-71, 214, 358, 364 Bureau of Economic Analysis (BEA), 280, 300 Burns, Arthur, 260, 261 business cycle theory, 25 output growth and, 315 variability in, 361 Caballero, R. J., 56, 175 call options, 67 Calomiris, Charlie, 101 Canzoneri, M., 40 Capital Asset Pricing Model (CAPM), 264 Carney, Mark, 23 cash flows discount rate of, 264 free, 265-66 future free, 264 cash hoarding, 29-30, 61 cash-arbitrage argument, 156 cashless limit, negative interest rate policy in, 50–53 Cato Journal, 97, 300 CBO. See Congressional Budget Office CCTW model, 241 CEA. See Council of Economic Advisers central banks, 3-4, 21, 23 Bernanke on, 37-38 core power of, 178 credibility of, 31, 357 deviation of rules by, 217-18 on discretion, 248 ELB and, 131 independence of, 33, 163 inflation and, 40, 329 inflation targeting by, 31, 289 interest rates and, 104 lower bounds and, 105 output gaps and, 329 price stability and, 100 reserve accounts at, 156 short-term nominal interest rate and, 110-11 Taylor on, 304-5 in United States, 169-70 central payment system, federal reserve and, 267-68

Chen, H., 175 China, fiscal shocks in, 43-44 Christiano, L., 219, 237-38, 241, 254 Cieslak, A., 268 Clarida, Richard, 20-26, 99, 108, 171-72, 324, 365 on Federal Reserve, 302 Cleveland Fed, 352n11 CMR14 model, 241 Cochrane, John, 25, 93, 166, 169, 252, 267 on financial crisis, 305 on forward guidance, 358-59 coefficients on inflation expectations, 326f on lagged inflation, 326f Coenen, Günter, 167 Cogan, J., 241 cohort consumption by, 317f endowment profiles mass by, 313f labor force participation by, 316f labor income mass by, 317f leisure decisions by, 316f net asset-holding mass by, 318f commercial paper rate, Federal Reserve and, 206 Congressional Budget Office (CBO), 5, 227 output gap, 232 constrained discretion, 20 Consumer Price Index (CPI), 42n9, 44-45 caps, 69 synthetic breakevens and, 69 in United States, 47-48 consumption aggregate growth and, 315 by cohort, 317f of households, 315 life cycle, 320 monetary policy and, 95-96 See also personal consumption expenditures core power, 178 corridor system, 179f discount rate in, 200 interest rates in, 200 for short-term interest rates, 178-79 cost-push shock, 236 Council of Economic Advisers (CEA), 260 CPI. See Consumer Price Index credibility of central banks, 31, 357 earning, 331-32 of Federal Reserve, 161, 331-32 of forward guidance, 40 Levin on, 357

credit cycle, Federal Reserve and, 305-6 credit market household, 314 nominal GDP and, 312 reallocation by, 316 Crowe, Chris, 21 Crump, Richard, 76, 338 Cúrdia, V., 175 currency dual-currency system, 54 electronic, 29-30, 54-55 exchange rates, 54-55 foreign, 57 hoarding of, 29-30, 61 magnetic stripes in, 54 paper, 53-58, 61-62, 84 size of, 214 See also digital cash The Curse of Cash (Rogoff), 83 Cwik, T., 241 Dallas Fed, 335 on inflation expectations, 339-40 on productivity, 360-61 on structural forces, 340-41 Dallas Fed Trimmed Mean, 335-36 Daly, Mary, 358-59, 361-62, 365 D'Amico, S., 47 data dependence, 5-8 defining, x, 352 of federal funds rate, 6-7 forms of, x monetary policy and, 6-7 in rules-based frameworks, xi in United States, 7 Williams on, 274 Davies, S., 54 debt beta, 265 debt destruction, 36-39 deflation, 359-60 Dell'Ariccia, G., 58 demand shocks, 104, 115-16 impulse response functions and, 137f interest rate rule with, 112n5 monetary policy and, 154t negative, 136 output gap and, 136-37 positive, 137 Democrats, fiscal policy of, 39 deposit rates, 167 difference rule, 218 digital cash, 93-95, 357-58 accounts, 81-82 design principles for, 81

ELBs and, 83-85 establishment of, 81 financial crisis and, 85-86 financial stability and, 85-86 implementation of, 97-98 as medium of exchange, 86 practical steps for, 86-87 as store of value, 86-87 digital savings accounts, 95 discount rate borrowed reserves and, 182f of cash flows, 264 in corridor system, 200 federal funds rate and, 179, 180f, 182f, 200 - 201Federal Reserve, 200 maturities and, 265n1 notation for, 265n1 discount window, Federal Reserve, 179-81 "Discretion vs. Policy Rules in Practice" (Taylor), 4 disinflation, Volcker, 256, 331-32, 357 disruption, 341, 360 Dodd-Frank act, 305-6, 363 dot plots, 281 FOMC, 284f hypothetical, 285 dovish policies AIT and, 120-21 on interest rates, 118-19 Draghi, Mario, 23 dual-currency system, 54 dual-mandate objectives, 5-6 dynamic first-difference rule, 224 dynamic rules, 170 dynamic stochastic general equilibrium, in macroeconomic models, 208 ECB. See European Central Bank economic expansion, 162-63 economic output, growth in, 162 economic recovery adequacy of, 71-73 Federal Reserve and, 73-81, 85 QE and, 80f regime change and, 161 in United States, 72f V-shaped, 92-93, 101 The Economist, 266 education, labor market and, 337

Edwards, Sebastian, 23, 208–9 effective lower bounds (ELBs), 70 binding, 116 central banks and, 131 effective lower bounds (ELBs) (continued) digital cash and, 83-85 mitigation of, 83-85 Eggertsson, G., 39, 109, 175 Eichenbaum, M., 219, 237-38, 254 Eisler, R., 30, 55, 61 ELBs. See effective lower bounds electronic currency, 29-30, 54-55 electronic payments, 156-57 Employment Report, 275 endowment profiles mass, by cohort, 313f equity beta, 265 equity-share contracting, 314-15 Erceg, Chris, 95-96, 357 EU. See European Union Euler equations in New Keynesian model, 155 for output gap, 110 Euribor rate, 157 European Central Bank (ECB), ix-x, 81, 178 fine-tuning operations of, 210 on forward guidance, 167 interest rates of, 157 QE by, 35 European Union (EU) interest rates in, 28, 157 negative interest rate policy in, 49-50, 57-58, 157-58, 167 Eusepi, Stefano, 338 Evans, Charlie, 165, 237-38, 254 Evans rule, 270 excess reserves federal funds rate and, 183f interest on, 183f exchange rates currency, 54-55 fixing, 167 expectations theory, 290 See also inflation expectations Facebook, 266 Farhi, E., 56, 175 FD rule deviations from, 229 federal funds rate and, 228f, 235f Federal Reserve on, 224 inflation and, 242 measure of, 230f optimizing, 240 outcomes under, 246 performance of, 239-41 FDdyn, 224 dynamic simulation of, 234 federal funds rate and, 235f

Federal Deposit Insurance Corporation, 183 federal funds rate BA rule and, 228f borrowed reserves and, 182f cuts, 324 daily effective, 187f data dependence of, 6-7 determination, 181f, 184f deviations, 226f discount rate and, 179, 180f, 182f, 200-201 excess reserves and, 183f FD rule and, 228f, 235f FDdyn and, 235f Federal Reserve and, 195 before financial crisis of 2007-2009, 195 Fisher on, 301 FOMC on, 197, 278, 335 forecasts of, 278-80 historical, 232 IOER and, 183f, 184, 186 lending volume and, 187f longer-run expectations, 15f market quotes and, 10f market-implied probability distribution of, 11 NPP rule and, 228f PCE deflator and, 233f PL rule and, 231f, 233f projections of, 10f rules and, 228f setting of, 203-4 T93 rule and, 228f, 231f, 233f T93adj rule and, 231f, 233f Taylor rule and, 226f tri-party repo rate and, 190 Federal Home Loan Banks (FHLBs), 182 lending from, 186 Federal Open Market Committee (FOMC), 5-6, 70, 77, 155, 171, 180, 205-6, 303 accountability of, 350 on central tendencies, 281 confidence intervals of, 281, 284f dot plots, 284f on federal funds rate, 197, 278, 335 Federal Reserve and, 275-76 on floor system, 197 forecasts of, 277-78 framework decision of, 347 GDP growth and, 278 on inflation, 8f inflation outcomes and, 279 on inflation targeting, 346-47, 351 on interest rate rules, 218 mandate of, 5n7

minutes of, 176 on monetary policy, 278, 284f, 345-46 negative feedback loops and, 273 projections of, 324 public comments of, 276 on QE, 74-75 review of, 345 SEP and, 277-78, 281 on uncertainty, 350 on unemployment rate, 72f Federal Reserve, xiii, xv, 21, 94-95 activist policy of, 271-72 balance sheet of, 159, 163, 177-78, 272, 284, 302 balanced-approach rule of, 223 borrowing of, 209 challenges of, 309-10 Clarida on, 302 commercial paper rate and, 206 credibility of, 161, 331-32 deviations from rules of, 227-35 discount rate, 200 discount window, 179-81 drivers affected by, 265 dual mandate of, 271, 274, 279-80 economic projections of, 282t economic recovery and, 73-81, 85 on FD rule, 224 federal funds rate and, 195 after financial crisis of 2007-2009, 163 financial markets and, 269, 305-6 financial stability and, 271, 305-6 floor system of, 196-97, 201 FOMC and, 275-76 forecasting of, 274, 277-85 freedom of, 208 Friedman on, 28-29 on futures, 10 during Great Moderation, 270 implementation procedures, 198 improvement of, 275-76 incentives and, 25 independence of, 163-64, 365 on inflation, 100 inflation expectations and, 274, 339-40 inflation targeting by, 342 inside information of, 275-76 on interest rate rules, 222-25, 301-2 on interest rates, 158, 194 macroeconomic models and, 235-47 mandate creep of, 271-73 market perceptions of, 296, 302-3 monetary policy of, ix, 161, 177-78, 195 nominal GDP targeting and, 198

nominal growth and, 296 objectives of, 173-74, 200, 270-71 overnight loans of, 173 overreacting of, 274 ownership of, 38 policy statements of, 276-77, 300 policy tools of, 270-71 preeminence of, 161-62 on price-level targeting rule, 229 QE and, 33-34, 211, 271-72 reserve balances and, 159f reserves at, 87 review of, ix, xvi, 309, 323 risk assessment of, 280 risk premia and, 267 securities holdings of, 175f Shultz on, 307 size of, 218 stock market and, 271 strategy selection of, 309-10 sufficiency of, 41 survey data, 9n12 in taper tantrum, 272 toolbox of, 73-81 uncertainty and, 267-68 valuations and, 267-68 weekly liabilities, 189f Federal Reserve Bank of Chicago, 364 Federal Reserve Bank of New York, 196, 204-5,274 Ferrero, A., 175 FHLBs. See Federal Home Loan Banks fiat money system, 195 Filardo, Andy, 213, 360, 362-63 financial crisis, 324 Cochrane on, 305 digital cash and, 85-86 See also Great Recession financial crisis of 2007-2009, 161 federal funds rate before, 195 Federal Reserve after, 163 monetary policy and, 363 financial markets Federal Reserve and, 269, 305-6 monetary policy and, 8-13 signals and noise in, 8-13 financial stability digital cash and, 85-86 Federal Reserve and, 271, 305-6 negative interest rate policy and, 58-59 financial wealth, Gini coefficients, 318 fine-tuning operations, of ECB, 210 firm value, 264 firm-specific risk, 263-64

Index

fiscal councils, 38-39 fiscal policy of Democrats, 39 monetary policy and, 162-64 of Republicans, 39 in US, 39 fiscal shocks in China, 43-44 in United States, 43-44 Fisher, Peter, 92, 203 on federal funds rate, 301 Fixed Income Clearing Corporation, 186 floor system of Federal Reserve, 196-97, 201 FOMC on, 197 interest rates in, 200 FOMC. See Federal Open Market Committee foreign currency holdings, 57 forward curve, illustration of, 293f forward guidance, 30-31 Cochrane on, 358-59 credibility of, 40 defining, 39 ECB on, 167 inflation targets and, 39-41 Reifschneider-Williams rule and, 304 Frankel, Jeff, 300 FRB-US model, 221, 254, 255, 256f forecasts, 278 free cash flows, 265-66 Friedman, Milton, 14, 21, 56, 81, 94, 99, 199 on Federal Reserve, 28-29 on inflation, 2 on interest rate rules, 220 on interest rates, 28-29 on liquidity, 214 on monetary policy, 2n3 on unemployment, 2 Friedman rule, 166, 169 Fuhrer, J., 40 future free cash flows, 264 futures Federal Reserve on, 10 interest rates, 9, 11 Galí, Jordi, 108.

GCF. See general collateralized finance rate GDP. See gross domestic product general collateralized finance rate (GCF), 186 targeting, 215 Germany, 52 Gertler, M., 108, 175 Gesselian stamp tax, 54 Giannoni, Marc, 108–9, 338 Gini coefficients calculation of, 317-18 financial wealth, 318 labor income mass and, 317 in United States, 318f globalization, 360 Gnocchi, Stefano, 328 Goldman Sachs, 307 Goodfriend, Marvin, 54, 91, 180 government debt, maturity structure of, 33-34 government liabilities, QE and, 33 government-sponsored enterprises (GSEs), 212 - 13Great Depression, 100, 161 Great Inflation, 256 Great Moderation, 256 Federal Reserve during, 270 Great Recession, 70, 199n3 labor force participation and, 72-73 monetary policy and, 349 performance during, 227 Greenlaw, D., 176 Greenspan, Alan, 3, 270 on yield curve, 301 Greenwood, R., 33, 175 gross domestic product (GDP) deflator, 231f, 232 growth, FOMC and, 278 See also nominal GDP targeting growth aggregate, 315 aggregate technology, 320 consumption, 315 in economic output, 162 GDP, 278 nominal, 296 output, 315 in take-home pay, 162 in US, 57-58 GSEs. See government-sponsored enterprises Guha, Krishna, 22, 164-65 Gürkaynak, R. S., 46 Hamilton, James, 175, 177, 194, 200, 203-4, 210-12, 214 Handbook of the Equity Risk Premium (Cochrane), 267 Harlow, Bruce, 261 Harrison, R., 109 Heider, F., 157, 158 helicopter money, 36-39 Hetzel, Robert, 350 Hodrick, Laurie, 306

Hoover Institution, xiv, 71, 99 households consumption growth of, 315 credit market, 314 debt, 314 log-log-preferences of, 312 human capital, 360-61 hyperactive fiscal policy, 36-39 Iacoviello, M., 241 Ihrig, Jane, 215 IMF. See International Monetary Fund impulse response functions, 133f, 134f demand shocks and, 137f supply shocks and, 130f, 135f impulse responses, productivity shocks and, 319f IN10 model, 241 incentives, Federal Reserve and, 25 indebtedness, 317-18 inequality, 341 inflation, xvi, 20, 24, 104, 113 breakeven, 12 central banks and, 40, 329 falling, 324-25 FD rule and, 242 Federal Reserve on, 100 FOMC on, 8f Friedman on, 2 gap, 252 goals, in United States, 345 lagged, 326f longer-run expectations of, 13 long-term interest rates and, 291f macroeconomic models of, 9 market-based inference of, 13 model-based inference of, 13 nominal GDP and, 320 outcomes, FOMC and, 279 output gap and, 152-54, 245f patterns, 327f PCE, 280, 281 Phillips curve and, 110 quality-adjusted, 280, 300 reduction of, 294, 323-24 regime change, 171 relative standard deviations of, 242 shocks, negative, 168 standard deviation of, 239 steady-state standard deviation of, 240f survey data on, 12-13 sustained high, 44-48 T93 rule and, 243f true, 170

uncertainty and, 9n11 unconditional distribution of, 152-54 unemployment and, 2 in United States, 170 variability trade-offs, 245f volatility, 166, 219 inflation expectations, 8, 41 anchoring of, 294 approximations of, 150 breakeven and, 46-48 coefficient on, 326f convergence of, 293 Dallas Fed on, 339-40 Federal Reserve and, 274, 339-40 implications, 298-99 interest rate rule and, 156 long-term, 42-44, 290-91, 293 market-derived, 43t measurement of, 44-48 in price-level targeting rule, 149 real world, 294-96 relevance of, 325-26 SAIT and, 145f short-term, 291-93 stable, 294f survey data and, 48t term structure and, 293 in United States, 48n12 upper bounds and, 117-18, 132f, 144f well-anchored, 299 Williams on, 325 yield curve and, 291f inflation rate, 110, 115-16 price-level targeting rule and, 134 under Reifschneider-Williams rule, 122-23, 135, 137 inflation targeting baseline, 329 central banks and, 31, 289 consequences of, 292-94 by Federal Reserve, 342 FOMC on, 346-47, 351 forward guidance and, 39-41 frameworks, 111-19 interest rates under, 292f, 295, 298-99 as international standard, 170 in Japan, 31 monetary policy and, 111-16 negative interest rate policy and, 52 path amendment of, 40 rises in, 30-31 vield curve of, 289 See also average inflation targeting inflation-linked bonds, 42n8, 45

inflation-tilting rule, 225 interest on reserve accounts, 156, 199 on reserve balance, optimality of, 159 interest rate on excess reserves (IOER), 181-84, 187f federal funds rate and, 183f, 184, 186 short-term interest rates and, 302 tri-party repo rate and, 185f interest rate rules Board of Governors on, 218 with demand shocks, 112n5 Federal Reserve on, 222-25, 301-2 FOMC on, 218 Friedman on, 220 inflation expectations and, 156 Meltzer on, 220 optimality of, 113n6 Taylor on, 220 temporary price-level targeting rule and, 151 interest rates, xi central banks and, 104 in corridor system, 200 cumulative changes in, 177f distribution of, 157 dovish policies on, 118-19 of ECB, 157 in EU, 28, 157 Federal Reserve on, 158, 194 in floor system, 200 Friedman on, 28-29 futures, 9, 11 under inflation targeting, 292f, 295, 298-99 in Japan, 28, 172 liquidity premium and, 295 long-term, 290-91, 291f long-term inflation expectations and, 290-91 monetary policy and, 155 natural, 2 New Keynesian model and, 315 nominal, 150n12, 156-57 price stability and, 2 QE and, 273 shadow, 226 short-term, 178-79, 295, 302 short-term nominal, 110-11 smoothing, 194, 198-201 swaps markets, 9 Taylor rule and, 112, 225 term structure of, 289-90 on Treasury bonds, 176f on Treasury securities, 290-91

in United States, 158, 172 volatility of, 292f, 293, 295 Wicksellian natural rate of interest, 315 zero percent, 166 See also effective lower bounds; negative interest rate policy interest rates on reserves (IOR), 87 International Monetary Fund (IMF), 363 international standards, inflation targeting as, 170 investment/savings (IS), 104 IOER. See interest rate on excess reserves IOR. See interest rates on reserves Ireland, Peter, 196n2, 204, 208, 210, 215 IS. See investment/savings Jackson Hole conference, 74 Japan financial crisis in, 28 inflation targets in, 31 interest rates in, 28, 172 negative interest rate policy in, 49-50, 57 QE in, 79-80 JEC. See Joint Economic Committee job creation, monetary policy and, 162-63 Joint Economic Committee (JEC), 76 JPMorgan Chase, 185 junk debt, 35-36 Kaplan, Robert, 324, 360 Karadi, P., 175 Kennedy administration, 260 Kiley, M. T., 58, 109, 170 Kim, Don H., 76 Kimball, Miles, 54 Klee, E., 183 Koby, Y., 49 Koenig, E., 109, 314 k-percent policy rule, 14, 22 Krishnamurthy, A., 76 Kydland-Prescott economy, 315 labor force participation, 26 by age, 72f by cohort, 316f Great Recession and, 72-73 prime-age, 337, 338f unemployment rate and, 72f labor income mass by cohort, 317f Gini coefficients of, 317 labor market education and, 337 unemployment rate and, 71-72

labor slack, 337-39 Lacker, Jeff, 205 lagged inflation, coefficients on, 326f large-scale asset purchases effects of, 174-78 QE and, 174 law of one price, 201 LCR. See liquidity coverage ratio Leduc, Sylvain, 328 leisure decisions, by cohort, 316f Lester, Benjamin, 182 Levin, Andrew, 29, 70-71, 92-96, 177, 238, 244 on credibility, 357 on repo rate, 210 on stress tests, 286 Levy, Mickey, 95, 300 LIBOR, 59f life cycle consumption, 320 Lilley, Andrew, 70, 171 liquidity, 12 Friedman on, 214 trap, 105n3, 115 liquidity coverage ratio (LCR), 213 liquidity preference hypothesis, 289-90 liquidity premium, interest rates and, 295 log-log-preferences, of households, 312 log-normal distribution, 313 longer-run expectations, of inflation, 13 Longer-Run Strategy Statement, 275 longer-term equilibrium, 346 long-term inflation expectations interest rates and, 290-91 short-term inflation expectations and, 293 long-term interest rates determination of, 290-91 inflation and, 291f loss ratio, 220 Loungani, Prakash, 70-71, 177 lower bounds binding, 169 central banks and, 105 equilibrium in, 105n3 of nominal interest rate, 156-57 supply shocks and, 169 zero, 157-58, 323, 331 See also effective lower bounds Macaulay duration, 69

Macro Model Data Base, xiv, 218, 221, 248 macroeconomic models, 109–11 dynamic stochastic general equilibrium in, 208 Federal Reserve and, 235–47

of inflation, 9 of monetary policy, 14-16 nominal interest rates and, 174-75 optimal rules in, 244-47 macroeconomic policy, 3 macroeconomic shocks, 346 macroprudential efforts, 305 Madigan, B., 40 makeup strategies, 327-28 market expectations, 271 market feedback monetary aggregates and, 296 monetary policy and, 296-98 market perceptions, of Federal Reserve, 296, 302-3 market pricing, 47-48 of options, 67-71 market quotes, federal funds rate and, 10f market signals, 211-12 Martin, Bill, 259 maturities, discount rate and, 265n1 maturity structure, of government debt, 33-34 maximum employment, 73 McCallum, B., 220 medium-scale policy model, 237-38 output gap in, 236 trade-off curve in, 246 Meltzer, A., 220 Mendes, R., 108, 114 Merrill Lynch Option Volatility Estimate (MOVE), 292f Mertens, Thomas, 105, 108-9, 114, 158, 170, 325 Mester, Loretta, 278, 364 Miller, Bill, 259 Minerd, Scott, 302 Miranda-Agrippino, S., 177 Mishkin, Rick, 20, 108-9 modern monetary theory (MMT), 163-64, 209 Moench, E., 76 monetary aggregates, market feedback and, 296 monetary paralysis, 31 monetary policy benchmark, 139 calibration, 153t, 154t clarification of, 351-54 consumption and, 95-96 data dependence and, 6-7 defining, 195-98 demand shocks and, 154t design, 61-62

monetary policy (continued) dynamic, 132-38 expectations of, 348-49 explanation of, 348-49 of Federal Reserve, 161, 177-78, 195 financial crisis of 2007-2009 and, 363 financial markets and, 8-13 fiscal policy and, 162, 163-64 FOMC on, 278, 284f, 345-46 framework comparison, 127-32, 330f Friedman on, 2n3 Great Recession and, 349 inflation targeting and, 111-16 interest rates and, 155 job creation and, 162-63 macroeconomic models of, 14-16 market feedback and, 296-98 New Keynesian model and, 155 nominal GDP and, 314 optimal, under discretion, 111-16 outcomes under, 138-40 parameterization of, 127-28 risk-free rate and, 266 role of, 1-5 shocks, 238 simulated effects of, 330f social losses and, 138f, 140f static frameworks, 128-32 stress tests, 286 supply shocks and, 125, 135, 153t systematic approach to, 351-54 uncertainty in, 349-51 Williams on, 158, 286 Monetary Policy Report, 6, 217, 221, 353 analysis of rules in, 252-53 deviations from rules of, 227-35 efficacy of, 248 rules in, 222-25 T93adj rule and, 232 monetary policy rules, xii-xiii money functions of, 81 markets, 211 private forms of, 81 See also currency money supply slowdown in, 297f true, 296 mortgages, securitized, 307, 314 Motto, R., 241 MOVE. See Merrill Lynch Option Volatility Estimate Moynihan, Pat, 260 Musk, Elon, 313

Nakamura, E., 177 Nakata, T., 108, 114 National Bureau of Economic Research (NBER), 70, 72f natural real interest rate, 236 NBER. See National Bureau of Economic Research negative feedback loops, FOMC and, 273 negative interest rate policy alternatives to, 32 in cashless limit, 50-53 customers and, 157-58 drawbacks, 62 in EU, 49-50, 57-58, 157-58, 167 fairness of, 57 financial stability and, 58-59 implementation of, 28-29, 50-53, 59-60 inflation targeting and, 52 in Japan, 49-50, 57 mildly negative, 49-50 nominal, 52 probability of, 68-69 QE compared with, 32-35 real assets and, 52 on reserve accounts, 159-60 risks of, 52-53 unconstrained, 27, 48-49 in United States, 28, 57 Nelson, Bill, 361 Neri, S., 241 net asset-holding mass, by cohort, 318f net investment, 265 New Keynesian model, xiv, 104, 109, 218 equations in, 155 Euler equation in, 155 interest rates and, 315 monetary policy and, 155 nominal GDP and, 311-12 nominal short rate in, 156 output volatility in, 219 Philips curve in, 155 small, 236 variables in, 110 Nikolsko-Rhevskyy, A., 220, 221, 225, 226, 254 Nixon, Richard, 260 NK. See small New Keynesian model nominal bonds, 45 nominal GDP targeting, xv-xvi, 169, 358 credit market and, 312 Federal Reserve and, 198 growth, 297f inflation and, 320 monetary policy and, 314 New Keynesian model and, 311-12

output gap in, 171 QE and, 306 quality-adjusted inflation and, 300 in recessions, 319 SEP on, 280, 300 targets, 300, 311, 320 Woodford on, 311 nominal growth, Federal Reserve and, 296 nominal income targeting, evaluation of, 327-28 nominal interest rate equations for, 150n12 lower bounds of, 156-57 nominal interest rates, macroeconomic models and, 174-75 nominal risk-free rates, 264 nominal short rate, in New Keynesian model, 156 nonpecuniary costs, 180 non-state-contingent nominal contracting, 314 NPP rule, 225, 229, 254-55, 257 federal funds rate and, 228f measure of, 230f performance of, 239-41 Office of Management (OMB), 260 OK. See small Old Keynesian model Okun's law, 4, 223, 270-71 Old Keynesian model, xiv, 218 output volatility in, 219 small, 237 OLG. See overlapping generations structure OMB. See Office of Management open-market operations, 210 operating procedure, 214 Operation Twist, 301 optimal interest rate rule, 120-21 "Optimal Monetary Policy in Closed Versus Open Economies" (Taylor), 23 options, 10 call, 67 market pricing of, 67-71 synthetic, 67 Orphanides, A., 167, 237 output gap, 104, 110 CBO, 232 central bank and, 329 demand shocks and, 136-37 equations for, 150n12 Euler equations for, 110 inflation and, 152-54, 245f in medium-scale policy model, 236 in nominal GDP targeting, 171

relative standard deviations of, 242 in small New Keynesian model, 236 in small Old Keynesian model, 236 standard deviation of, 239 steady-state standard deviation of, 240f T93 rule and, 243f unconditional distribution of, 152-54 variability trade-offs, 245f output gap-tilting rule, 223, 253-54 output growth, business cycle theory and, 315 output volatility, 219 overlapping generations (OLG) structure, 312 overnight debt, 93 overnight loans, of Federal Reserve, 173 Papell, David, 220, 221, 223, 225, 252, 254 paper currency, 53-58, 61-62 abolition of, 84 Pastor, L., 267 Paulson, Hank, 60-61 payment systems, 55-56 PC index, 25 PCE. See personal consumption expenditures PCE deflator, 223, 233f Penn Central, 260 pension funds, 61 personal consumption expenditures (PCE), 80, 232f, 351 core inflation, 325f headline inflation, 325f inflation, 280, 281 measurement of, 335-36 Phillips curve, 104, 127-28, 128n11, 270-71, 339, 361-62 inflation and, 110 in New Keynesian model, 155 Piazzesi, Monika, 155-60, 167-68 PL rule federal funds rate and, 231f PCE deflator and, 233f price-level targets in, 229 Plosser, Charlie, 22, 199n3, 365 on balance sheet, 273 PLT. See price-level targeting polarization, 161-62 policy rate path, 10 Poole, W., 179, 199 Powell, J. H., 272, 284, 286, 300 preferred habitat theory, 290 Prescott, Ed, 25, 94 price stability, 207-8, 336 central banks and, 100 interest rates and, 2 Taylor-type rules and, 4-5

price-level targeting (PLT), xiii, 107, 224-25, 326-27 AIT and, 331 algorithm for, 148-50 Bernanke on, 346-47 dynamic, 123-25 evaluation of, 327-28 Federal Reserve on, 229 with full makeup strategy, 331 inflation expectations in, 149 inflation rate and, 134 mechanisms of, 168 parameterized, 139 PL rule and, 229 state-level, 125 supply shocks and, 125 temporary, 125-27, 134, 151-52, 346-47 prime-age labor force participation, 337, 338f private banks, 178-79 Prodan, R., 220, 221, 225, 254 productivity, 26 Dallas Fed on, 360-61 impulse responses and, 319f profile, 312-13 shocks, 319f units, 313 Proulx, K., 175 public comments, FOMC, 276 public debt, 211 public-private partnerships, 97 pure expectations theory, 290 QE. See quantitative easing quadratic loss ratios, 257f quality-adjusted inflation, 280 nominal GDP and, 300 quantitative easing (QE), xi-xii, 31, 83 Bernanke on, 272 defining, 174 by ECB, 35 economic recovery and, 80f efficacy of, 74, 78t emergency, 35-36 Federal Reserve and, 33-34, 211, 271-72 fiscal, 35-36 fixing, 167 FOMC on, 74-75 government liabilities and, 33 interest rates and, 273 in Japan, 79-80 large-scale asset purchases and, 174 limitations of, 70-71 negative interest rate policy compared with, 32-35

nominal GDP and, 306 pure, 32-35 in US, 34-35 quarterly model, 312 quasi-fiscal policies, 30-31, 60 Reagan, Ronald, 261-62 real assets, negative interest rate policy and, 52 real bonds, 45 real-time measures of discretion, 225-27 recessions, 94-95, 272 nominal GDP in, 319 reference rate, 121 regime change, 171 Reifschneider, David, 107, 119 on forecasting, 278-79 Reifschneider-Williams rule, xiii, 107, 121-23, 128, 141 advantages of, 168 AIT and, 134, 165-66 algorithm for, 146-48 forward guidance and, 304 inflation rate under, 122-23, 135, 137 lemma 2, 146 relative standard deviations of inflation, 242 of output gap, 242 repo rate Levin on, 210 private, 190 reverse, 184-85 tri-party, 185f, 187f, 190 Republicans, fiscal policy of, 39 reserve accounts at central bank, 156 interest on, 156, 199 negative interest rate policy on, 159-60 reserve balances Federal Reserve and, 159f optimality of interest on, 159 residuals, 249 reverse repo rate, 184-85, 187f Ricco, G., 177 risk assessment, of Federal Reserve, 280 risk premia, 10 Federal Reserve and, 267 filtering for, 12, 22 uncertainty and, 290 risk-free rates monetary policy and, 266 nominal, 264 risk-neutral pricing, 23, 67-71 RMSEs. See root mean squared errors Roberts, J., 58, 109, 170

Rogoff, Ken, 54, 70, 83, 91-102, 171 root mean squared errors (RMSEs), 279 twenty-year average of, 284f Rostagno, M., 241 Rotemberg, J., 218 R-star estimates, 325f Rubin, Bob, 24-25 Rudebusch, G., 219, 237 rule-based international monetary system, 60 rules-based frameworks, data dependence in, xi Sack, Brian, 364 Şahin, Ayşegül, 338 Saidi, F., 157 SAIT. See static average-inflation targeting San Francisco Fed, 325-26 Schepens, G., 157 Schmidt, Helmut, 260 Schmidt, S., 108, 114 Schmitt-Grohé, S., 108, 114 securities, Federal Reserve holdings, 175f securitized mortgages, 307, 314 Selgin, George, 97, 169 Seneca, M., 109 Senyuz, Z., 183 SEP. See Summary of Economic Projections shadow interest rates, 226 Sheedy, Kevin, 314 shock absorbers, 301 AIT as, 329 shocks aggregate, 313 aggregate demand, 327 cost-push, 236 demand, 104, 112n5, 115-16, 136-37, 137f, 154t fiscal, 43-44 inflation, 168 macroeconomic, 346 monetary policy, 238 productivity, 319f supply, 125, 130-31, 130f, 134, 135, 135f, 141, 151, 153t, 169 short-term inflation expectations, 291-92 long-term inflation expectations and, 293 short-term interest rates corridor system for, 178-79 IOER and, 302 term structure and, 295f short-term nominal interest rate, central bank and, 110-11 Shultz, George P., 259-62 on Federal Reserve, 307

small New Keynesian model (NK), 236 small Old Keynesian model (OK), 237 output gap in, 236 trade-off curves in, 246 Smets, F., 237, 254, 255f Smets-Wouters model, 219, 221 social losses monetary policy and, 138f, 140f upper bounds and, 132f Solow, Bob, 260 SOMA. See System Open Market Account spot curve, illustration of, 293f static average-inflation targeting (SAIT), 119-23, 129, 145 inflation expectations and, 145f "Steady as You Go" (Shultz), 261 steady-state distribution, 238 steady-state standard deviation of inflation, 240f of output gap, 240f Steinsson, J., 177 stimulus, 70-71, 94 stock market, 274 Federal Reserve and, 271 stress tests, monetary policy, 286 structural forces, Dallas Fed on, 340-41 subsidies, in United States, 158 Summary of Economic Projections (SEP), 7, 7f, 324 addendums in, 281-82 FOMC and, 277-78, 281 forecasts in, 277, 280 median of, 325f on nominal GDP, 280, 300 publication of, 281 revamping, 279 Summers, Larry, 24-25 supply curve, 186 supply shocks, 141 cutoff, 151 impulse response functions and, 130f, 135f lower bounds and, 169 monetary policy and, 125, 135, 153t negative, 130-31 positive, 134 price-level targeting rule and, 125 responses to, 131 temporary price-level targeting rule and, 151 survey data Federal Reserve, 9n12 on inflation, 12-13 inflation expectations and, 48t Svensson, Lars, 108, 167, 219, 237

Swanson, E., 175 swaps markets, interest rates, 9 Sweden, 38-39 synthetic breakeven, 45-46 cap, 46f synthetic breakevens, CPI and, 69 synthetic options, 67 System Open Market Account (SOMA), 75-76 T93 rule, 229, 252-53, 255-56 federal funds rate and, 228f, 231f, 233f inflation and, 243f measure of, 230f output gap and, 243f PCE deflator and, 233f performance of, 239-41 T93adj rule, 229 federal funds rate and, 231f, 233f Monetary Policy Report and, 232 PCE deflator and, 233f take-home pay, growth in, 162 taper tantrum, 76-77 Federal Reserve in, 272 targeted inflation patterns, shocks and, 327f Tase, M., 183 Taylor, John, 4, 20-23, 109, 203-6, 238, 241, 243 on central banks, 304-5 on interest rate rules, 220 on policy rules, 252 Taylor rule, 4-5, 14-15, 52, 231 adjusted, 224-25, 236 defining, 218, 222-23 deviation, 148 expression of, 222-23 federal funds rate and, 226f interest rates and, 112, 225 properties of, 4n5 Taylor-type rules instrument-rule specification and, 5 price stability and, 4-5 Woodford on, 4-5 temporary price-level targeting, 125-27, 134 Bernanke on, 346-47 interest rate rule and, 151 supply shocks and, 151 term premia, 22 on Treasury, 12 term structure inflation expectations and, 293 of interest rates, 289-90 short-term interest rates and, 295f Teryoshin, Y., 221 Tetlow, R., 221

Thornton, D., 177 time-series models, evolution of, 15f TIPS. See Treasury Inflation-Protected Securities Tolley, G., 199 transparency, 284 Treasury (US) bonds, 45 debt issuing by, 93 term premiums on, 12 yield curve, 11 Treasury and Tax Loan Program (TT&L), 210 Treasury bills, 296 Treasury bonds, interest rates on, 176f Treasury Indexed Bonds, 45n11 Treasury Inflation-Protected Securities (TIPS), 21, 24-25, 42, 85n31 daily trading volumes on, 47 launch of, 12n13 market data, 12 spot rates, 12 Treasury securities, 47, 173 interest rates on, 290-91 TreasuryDirect, 95 Treasury-Fed Accord of 1951, 162 tri-party repo rate, 187f federal funds rate and, 190 IOER and, 185f true money supply, 296 TT&L. See Treasury and Tax Loan Program Tulip, Peter, on forecasting, 278 Turner, A., 36 uncertainty, 214 balance sheet and, 272-73 Federal Reserve and, 267-68 FOMC on, 350 in monetary policy, 349-51 point estimates and, 16f risk premia and, 290 vield curve and, 295 unemployment, 94 Friedman on, 2 gap, 234 inflation and, 2 unemployment rate, 5 FOMC on, 72f labor force participation and, 72f labor market and, 71-72 longer-run, 7f measurement of, 336 natural, 338-39 recession and, 21 in United States, 14-15, 71-72

unicorns defining, 266n2 valuation of, 266 United Kingdom, 38-39 United States (US) central banks in, 169-70 CPI in, 47-48 data dependence in, 7 economic recovery in, 72f fiscal policy in, 39 fiscal shocks in, 43-44 Gini coefficients in, 318f growth in, 57-58 inflation expectations in, 48n12 inflation goals in, 345 inflation in, 170 interest rates in, 158, 172 negative interest rate policy in, 28, 57 QE in, 34-35 subsidies in, 158 unemployment rate in, 14-15, 71-72 yield curve in, 24 upper bound, 116-19, 143-45 binding, 116 inflation expectations and, 132f, 144f inflation expectations with, 117-18 social losses and, 132f Uribe, M., 108, 114 US. See United States valuation, 271 Federal Reserve and, 267-68 of unicorns, 266 vanilla breakeven, 46f Vayanos, D., 175 vector autoregressions, 266 Veronesi, P., 267 Vissing-Jorgensen, A., 76, 268

Volcker, Paul, 3, 168–69, 262 Volcker disinflation, 256, 331–32, 357 Vuolteenaho, T., 266 WACC. See weighted average cost of capital Waldron, M., 109 Warsh, Kevin, 161-65 weighted average cost of capital (WACC), 264 welfare gains, 120-21 well-anchored inflation expectations, 299 Wenzel, Robert, 168-69 Whelpley, W., 180 Wicksellian natural rate of interest, 315 Wieland, Volker, 166-67, 170, 237, 241, 244, 252 Williams, John, 105-9, 114, 119, 155, 158, 244 on AIT, 165-66 on data dependence, 274 on inflation expectations, 325 on monetary policy, 158, 286 Woodford, Mike, 4-5, 39, 108, 109, 175, 218 on nominal GDP, 311 World Bank, 97 Wouters, R., 237, 254, 255f Wright, I., 76 Wu, J. C., 175

Yellen, Janet, 52, 253–54, 348 Yellen rule, 257 yield curve, 46–47 factors influencing, 292 Greenspan on, 301 inflation expectations and, 291f of inflation targeting, 289 shape of, 291–92 slope of, 295 Treasury, 11 uncertainty and, 295 in United States, 24 volatility, 299 Yoldas, E., 183

Zabai, A., 175 zero lower bound (ZLB), 157–58, 323 time at, 331