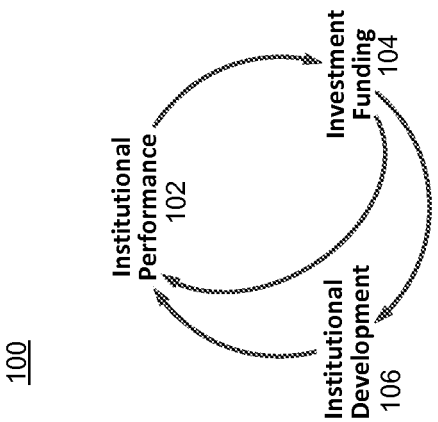

100
Institutional Performance 102
Investment Funding 104
Institutional Development 106

FIG. 1

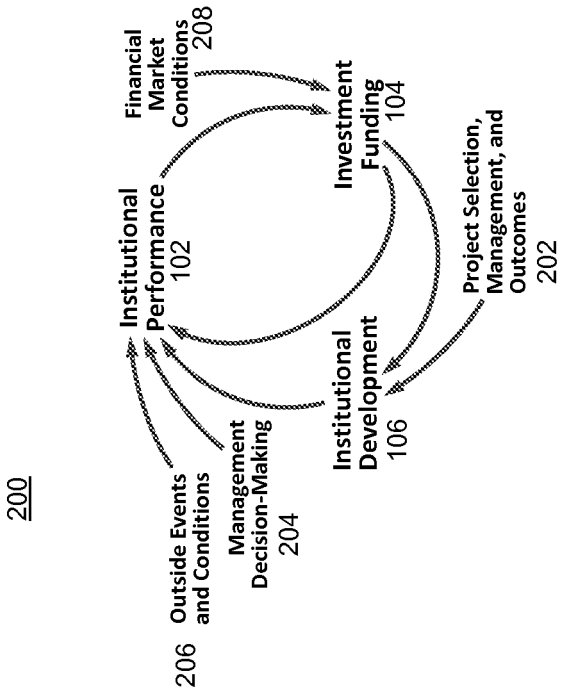

200
Financial Market Conditions 208
Institutional Performance 102
Investment Funding 104
Project Selection, Management, and Outcomes 202
Institutional Development 106
Management Decision-Making 204
Outside Events and Conditions 206

FIG. 2

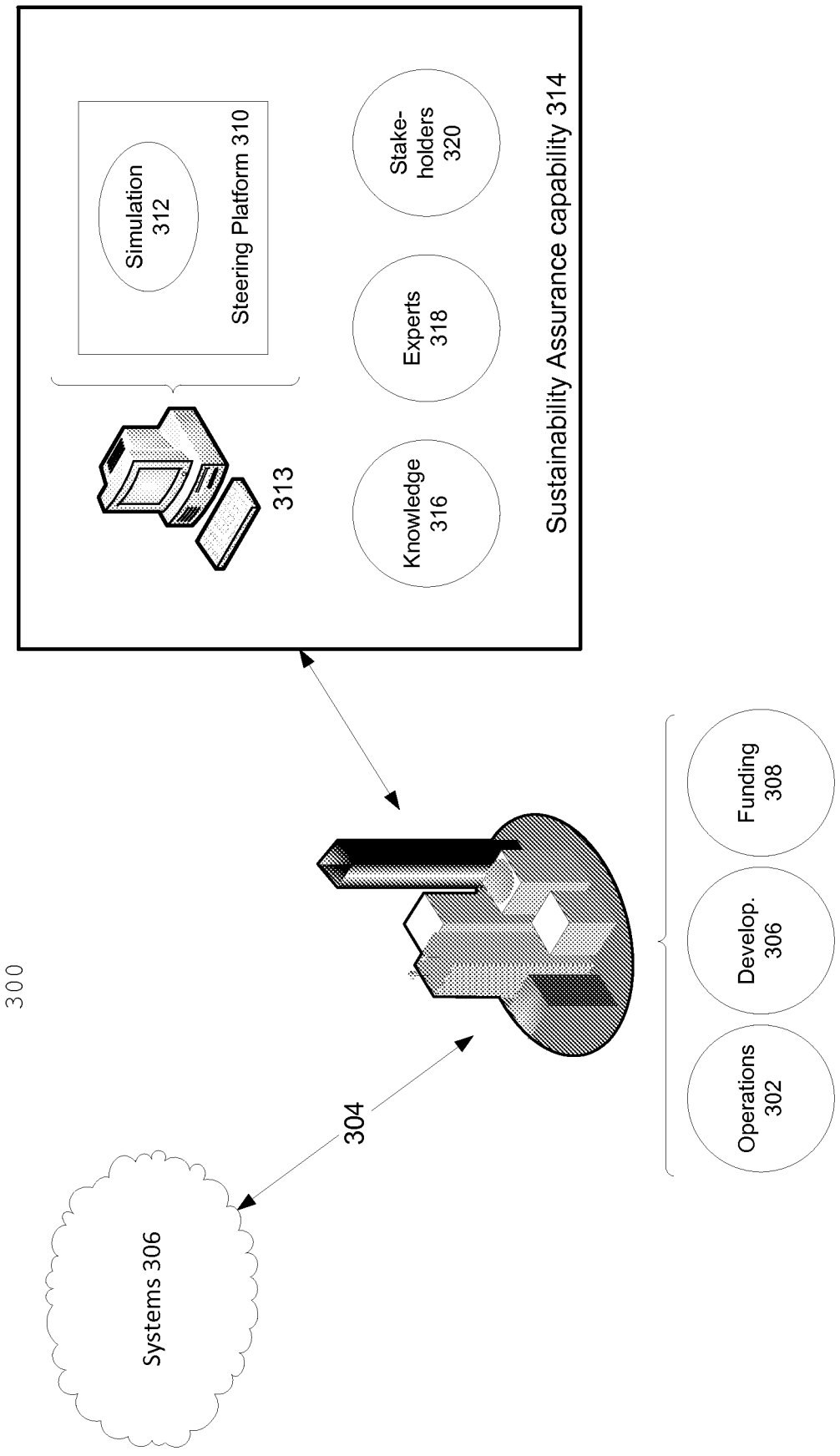

300
Systems 306
304
Operations 302
Develop. 306
Funding 308
Sustainability Assurance capability 314
Knowledge 316
Experts 318
Stake-holders 320
313
Steering Platform 310
Simulation 312

FIG. 3

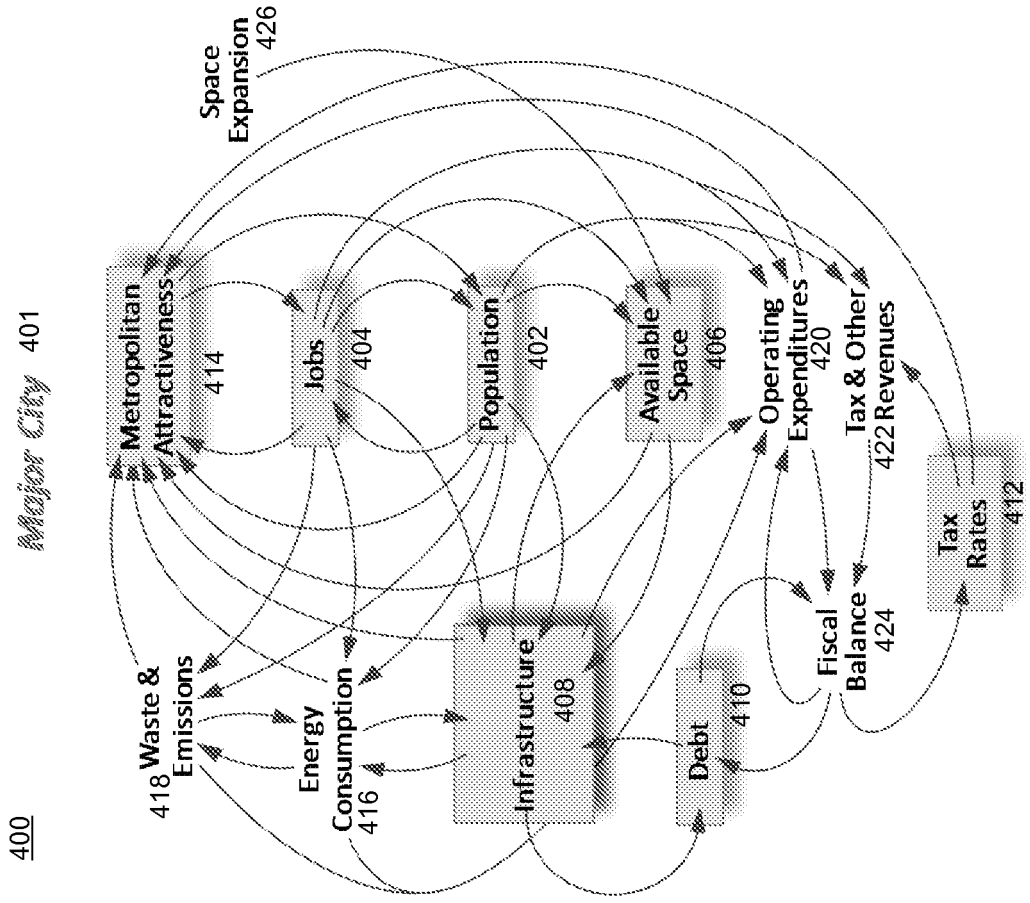

400
Major City 401
Space Expansion 426
Metropolitan Attractiveness 414
Jobs 404
Population 402
Available Space 406
Operating Expenditures 420
Tax & Other Revenues 422
Tax Rates 412
Fiscal Balance 424
Debt 410
Infrastructure 408
Energy Consumption 416
418 Waste & Emissions

FIG. 4A

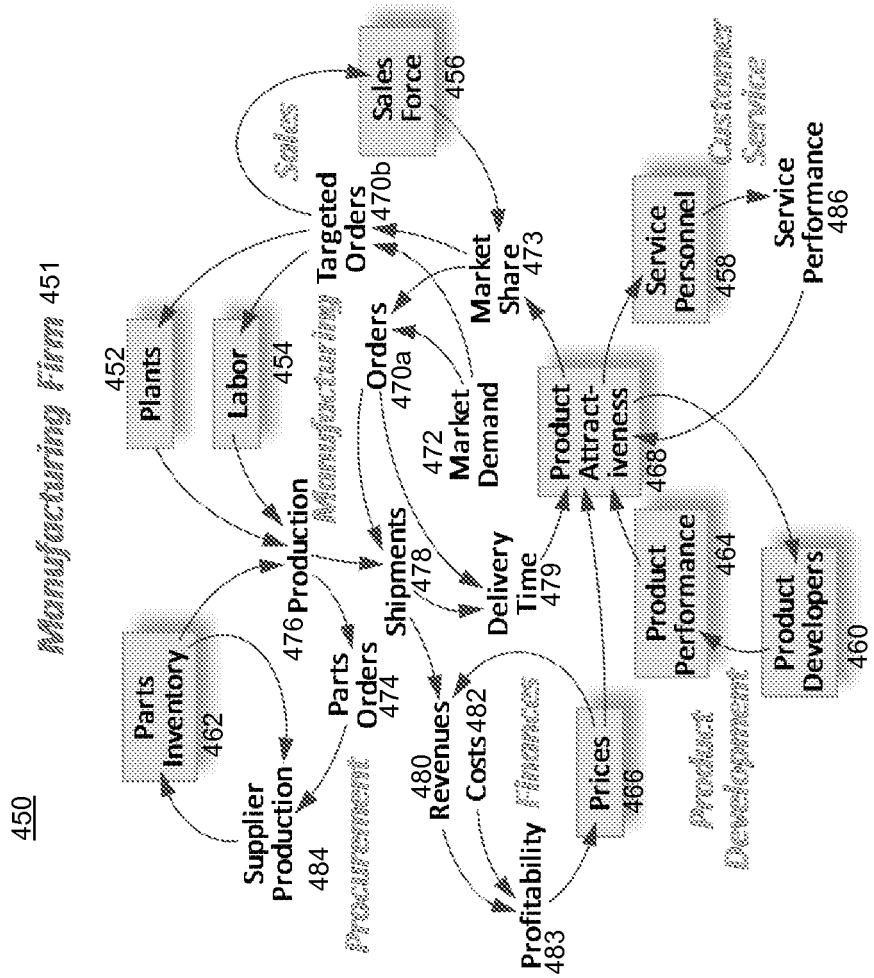

450
Manufacturing Firm 451
Procurement
Manufacturing
Sales
Finances
Product Development
Customer Service
Parts Inventory 462
Supplier Production 484
Plants 452
Labor 454
Production 476
Parts Orders 474
Shipments 478
Orders 470a
Targeted Orders 470b
Sales Force 456
Market Share 473
Market Demand 472
Delivery Time 479
Product Attract-iveness 468
Service Personnel 458
Service Performance 486
Product Performance 464
Product Developers 460
Prices 466
Revenues 480
Costs 482
Profitability 483

FIG. 4B

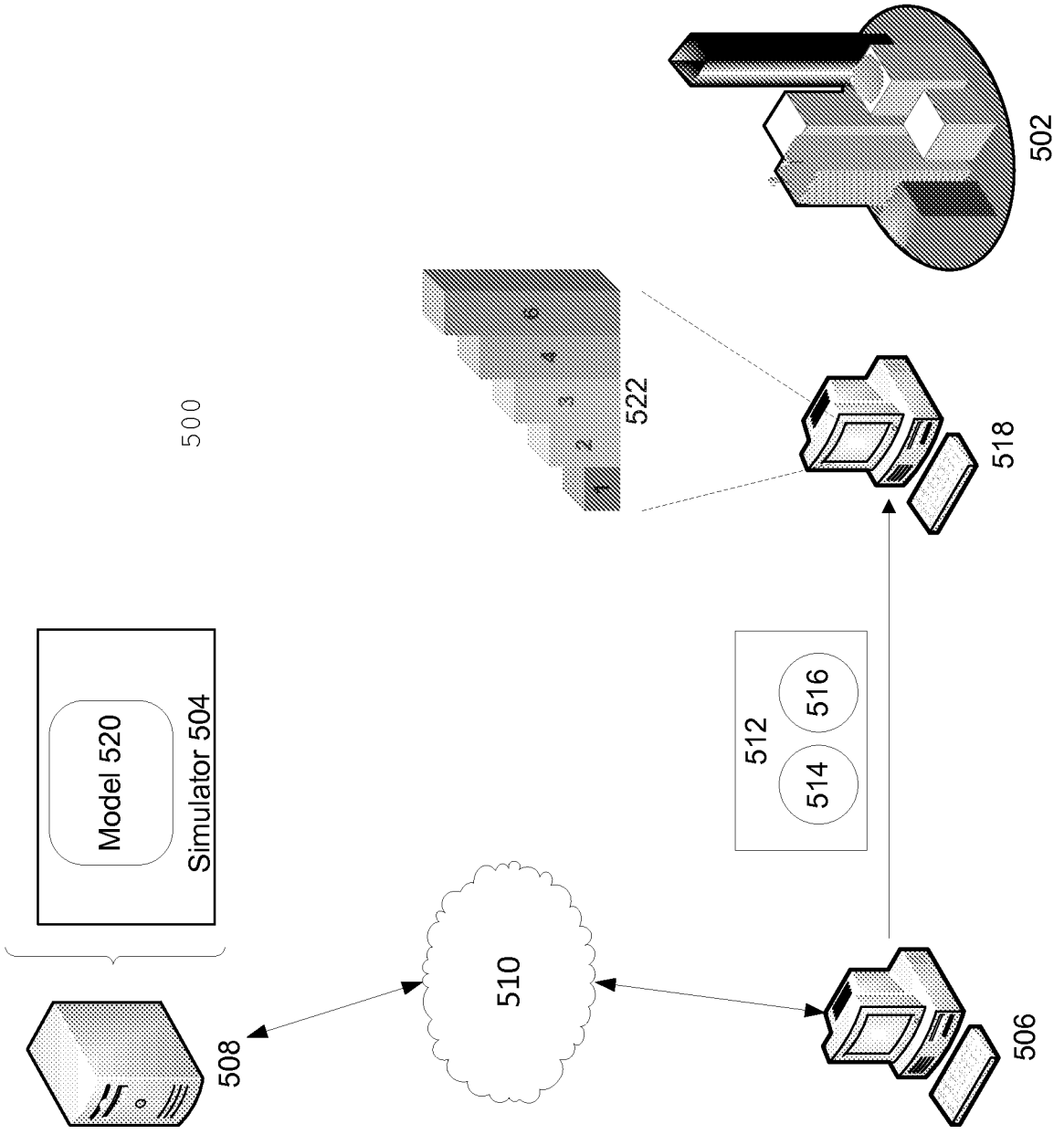

500
Simulator 504
Model 520
508
510
512
514
516
518
522
502
506

FIG. 5

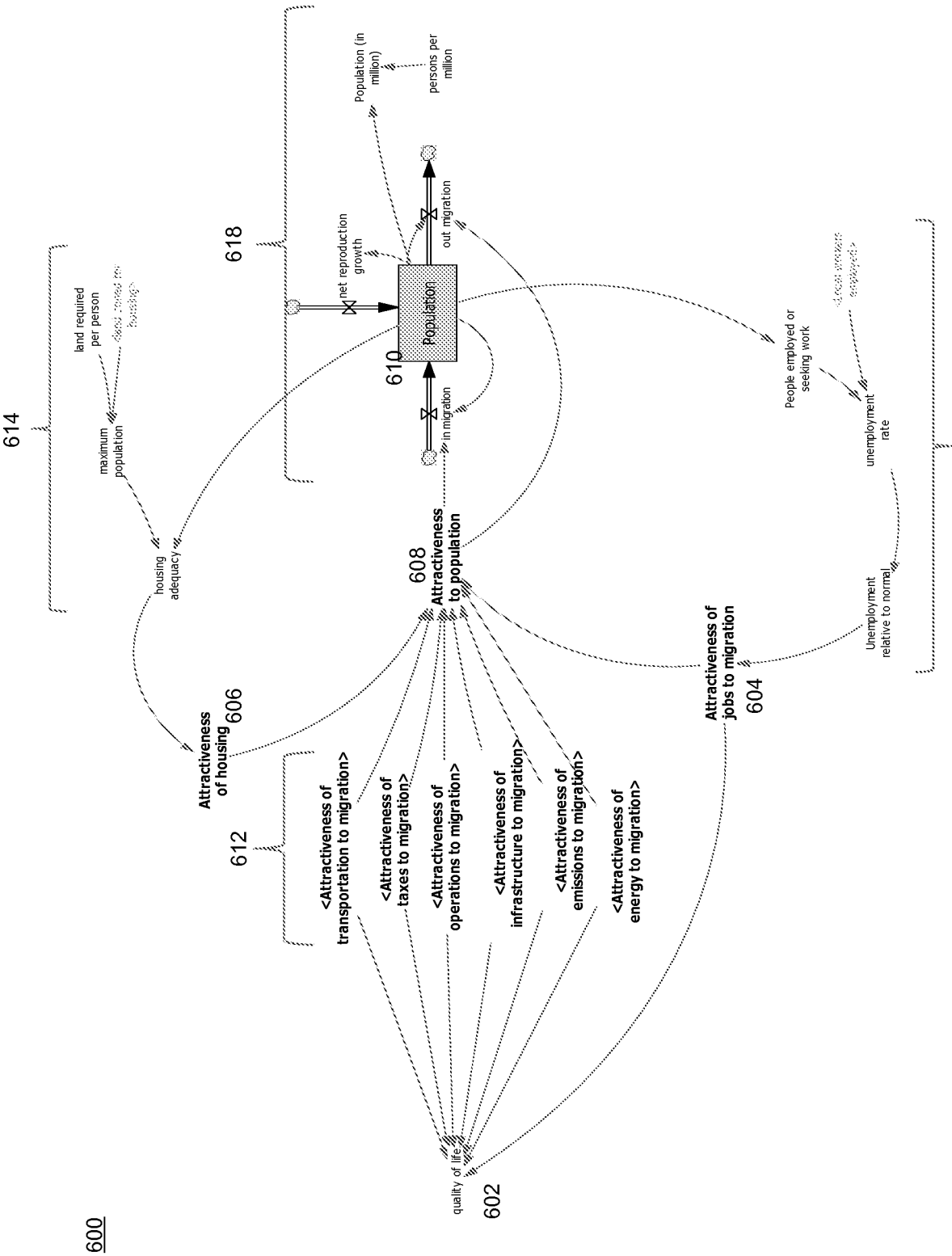

600
602
quality of life
604
Attractiveness of jobs to migration
606
Attractiveness of housing
608
Attractiveness to population
610
Population
612
<Attractiveness of transportation to migration>
<Attractiveness of taxes to migration>
<Attractiveness of operations to migration>
<Attractiveness of infrastructure to migration>
<Attractiveness of emissions to migration>
<Attractiveness of energy to migration>
614
land required per person
maximum population
housing adequacy
616
unemployment rate
Unemployment relative to normal
People employed or seeking work
618
net reproduction growth
in migration
out migration
Population (in million)
persons per million

FIG. 6

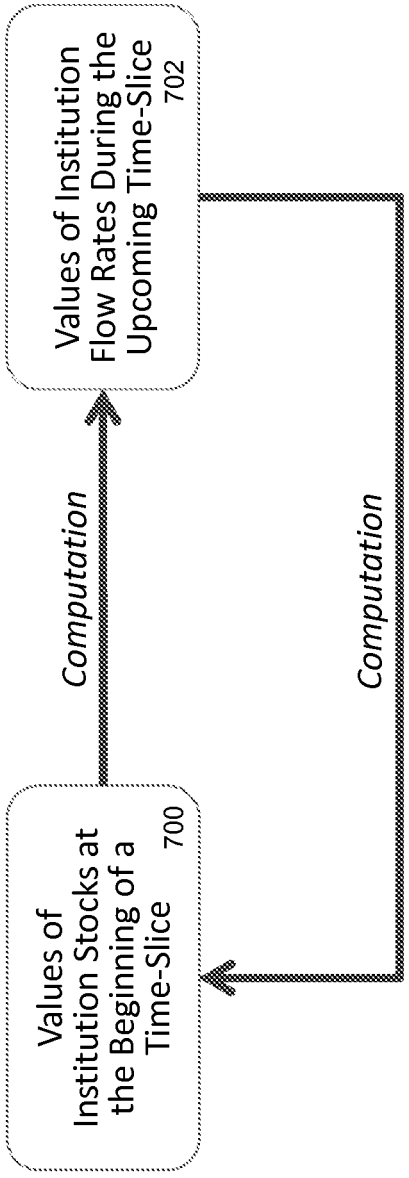

Values of Institution Flow Rates During the Upcoming Time-Slice 702
Computation
Computation
Values of Institution Stocks at the Beginning of a Time-Slice 700

FIG. 7A

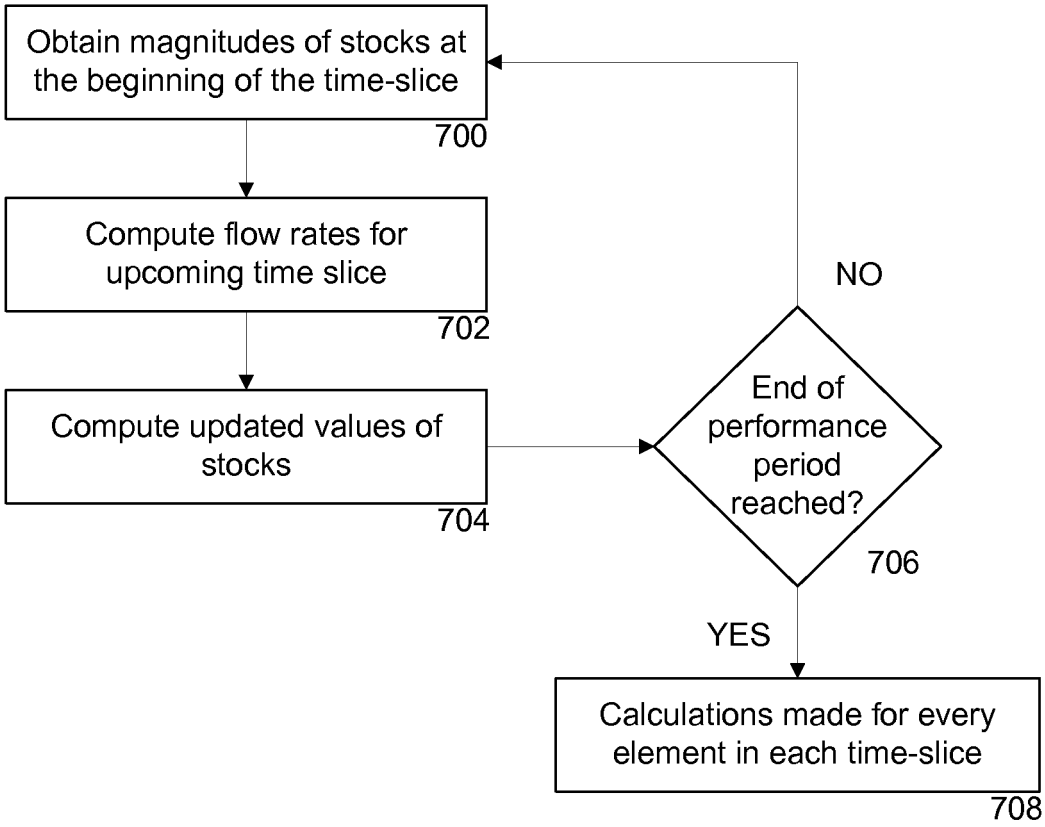

Obtain magnitudes of stocks at the beginning of the time-slice
700
Compute flow rates for upcoming time slice
702
Compute updated values of stocks
704
End of performance period reached?
706
NO
YES
Calculations made for every element in each time-slice
708

FIG. 7B

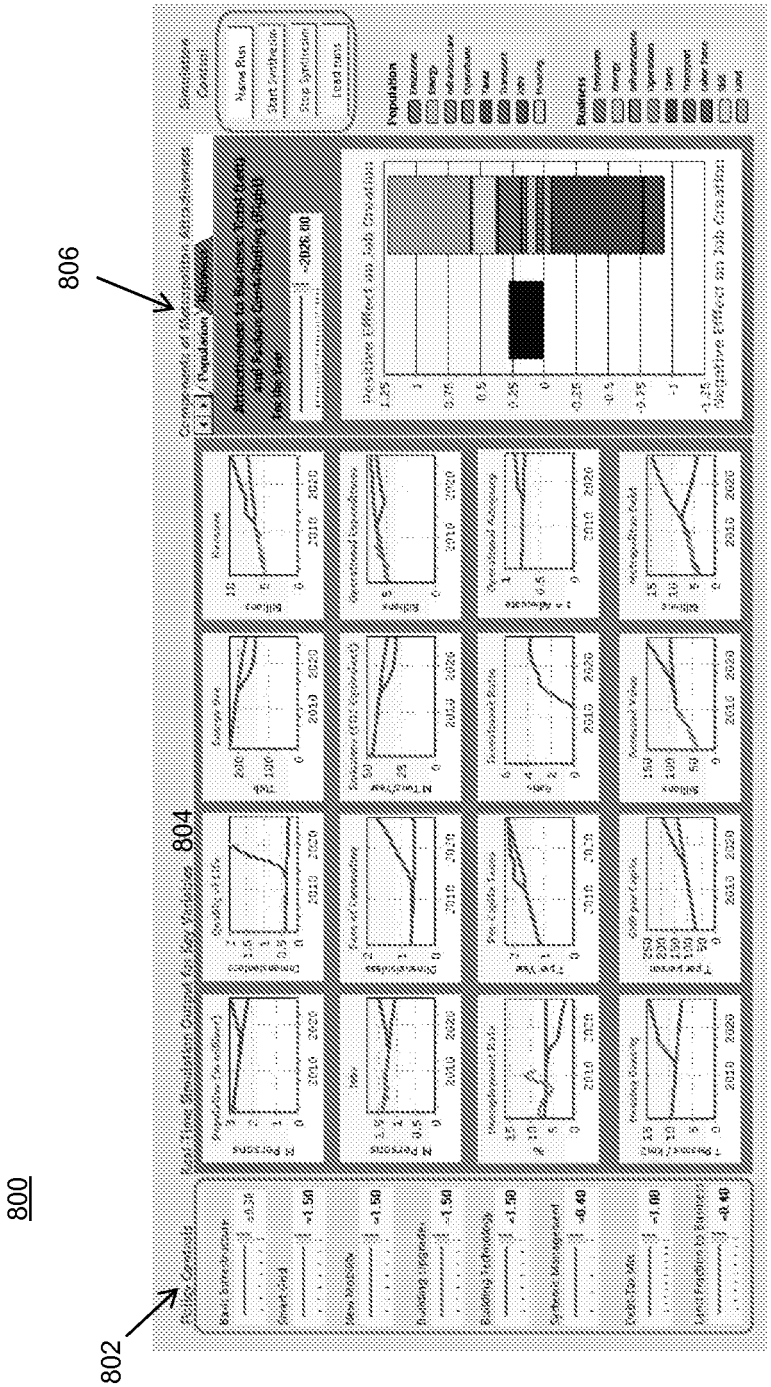


FIG. 8

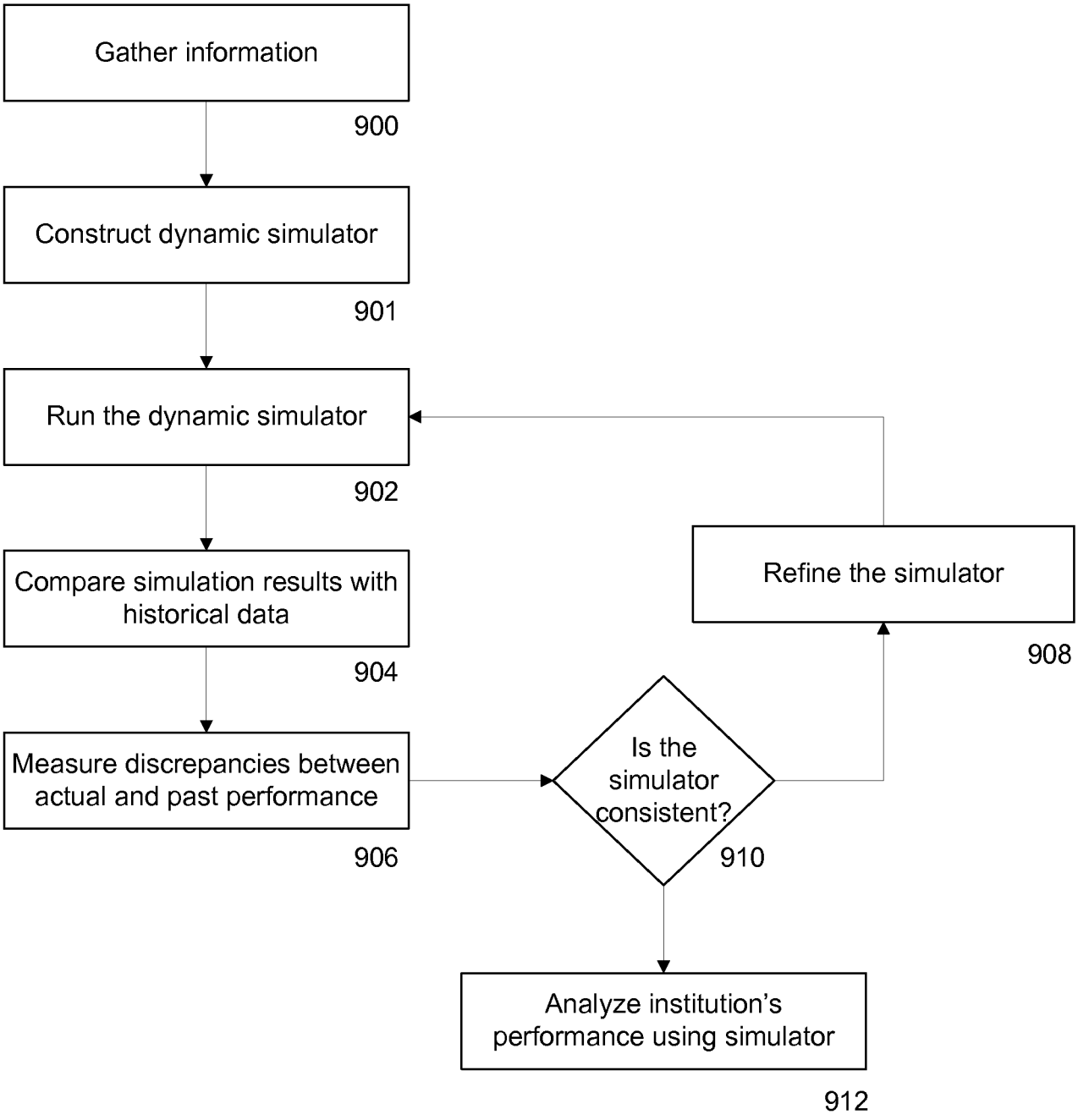

Gather information
900
Construct dynamic simulator
901
Run the dynamic simulator
902
Compare simulation results with historical data
904
Measure discrepancies between actual and past performance
906
Is the simulator consistent?
910
Refine the simulator
908
Analyze institution's performance using simulator
912

FIG. 9

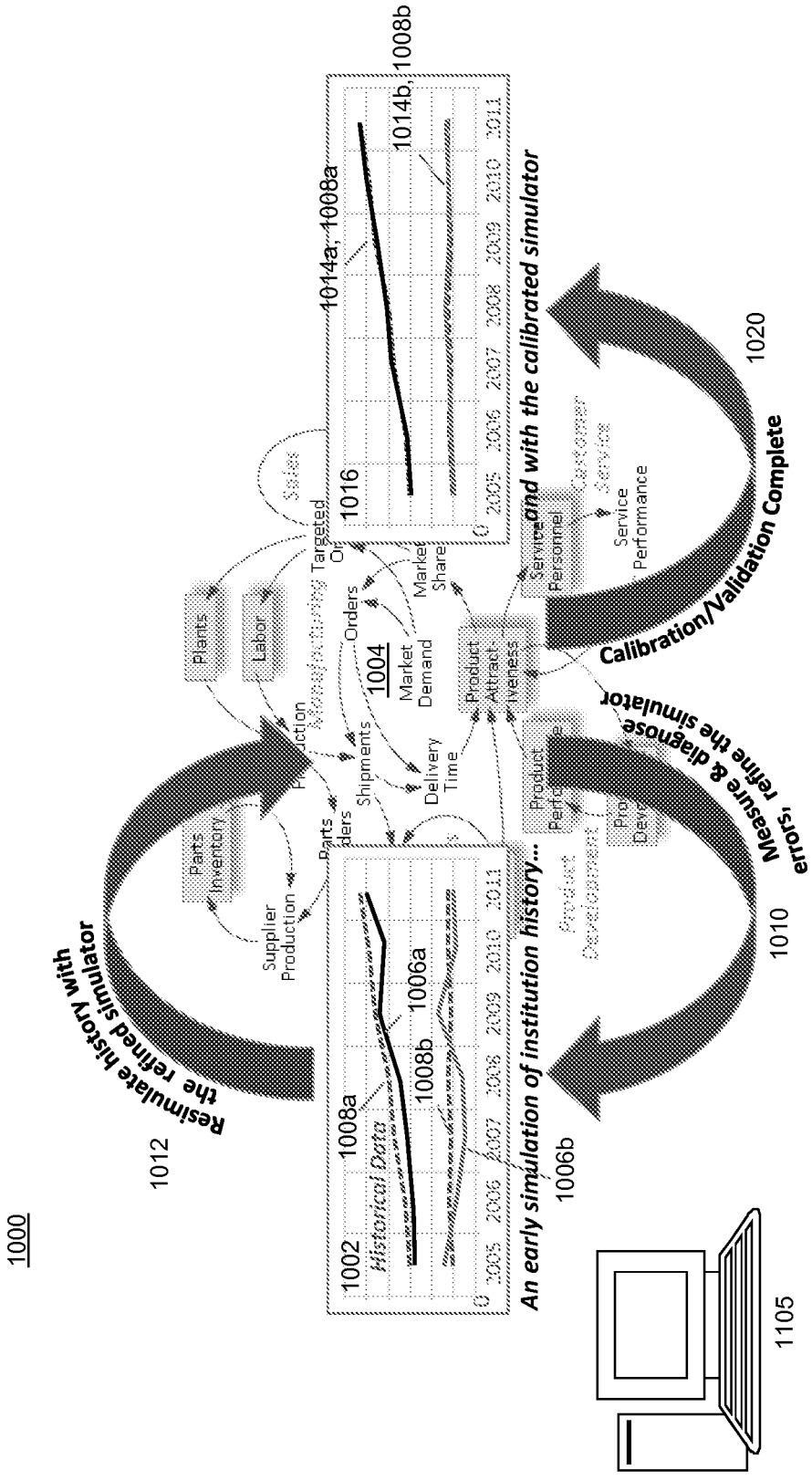

1000
1012
Resimulate history with the refined simulator
1002
Historical Data
1008a
1008b
1006a
1006b
An early simulation of institution history...
1004
1014a, 1008a
1014b, 1008b
1016
Calibration/Validation Complete
1020
Measure & diagnose errors, refine the simulator
1010
1105

FIG. 10

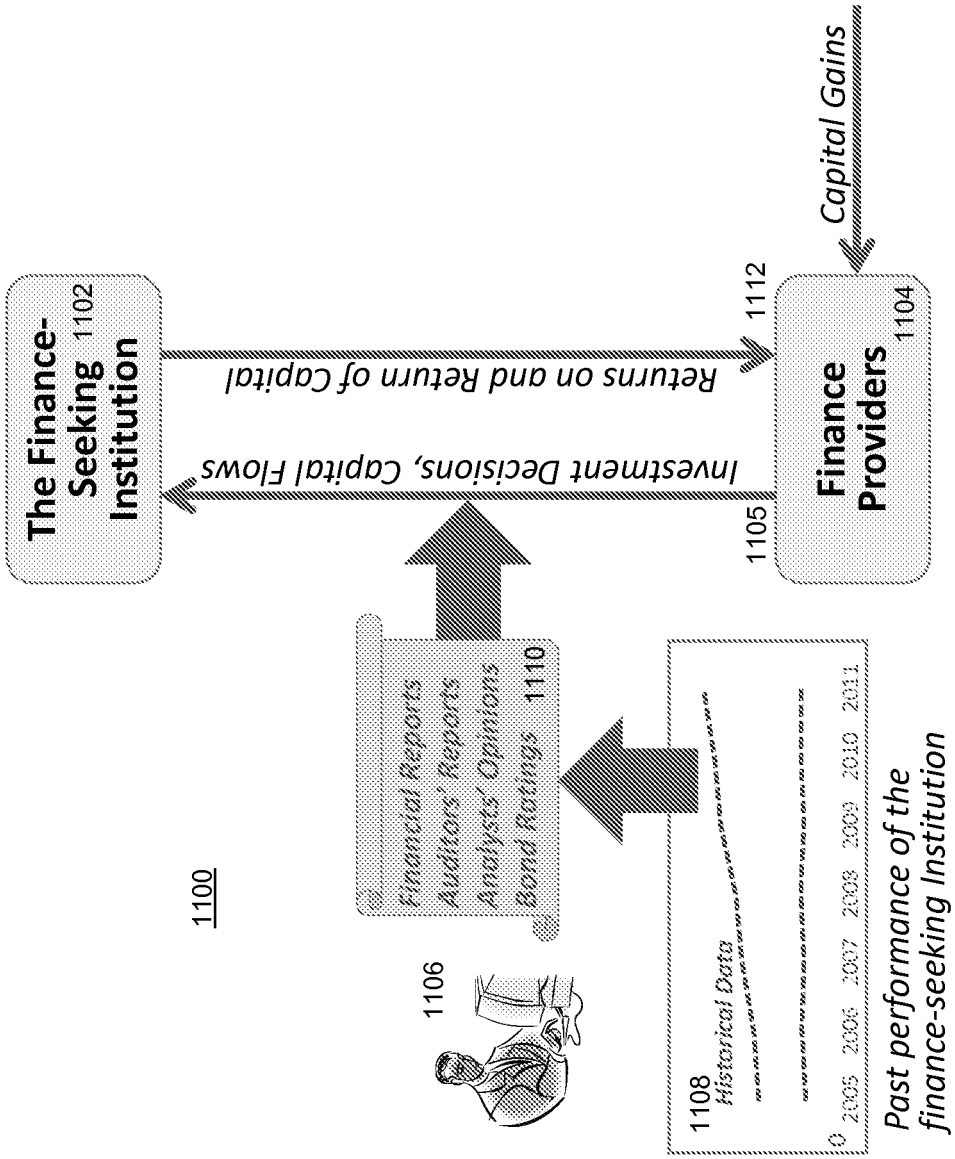

1100
The Finance-Seeking Institution 1102
Returns on and Return of Capital
Investment Decisions, Capital Flows
1112
1105
Finance Providers 1104
Capital Gains
Financial Reports
Auditors' Reports
Analysts' Opinions
Bond Ratings 1110
1106
1108
Historical Data
0
2005 2006 2007 2008 2009 2010 2011
Past performance of the finance-seeking Institution

FIG. 9

FIG. 11

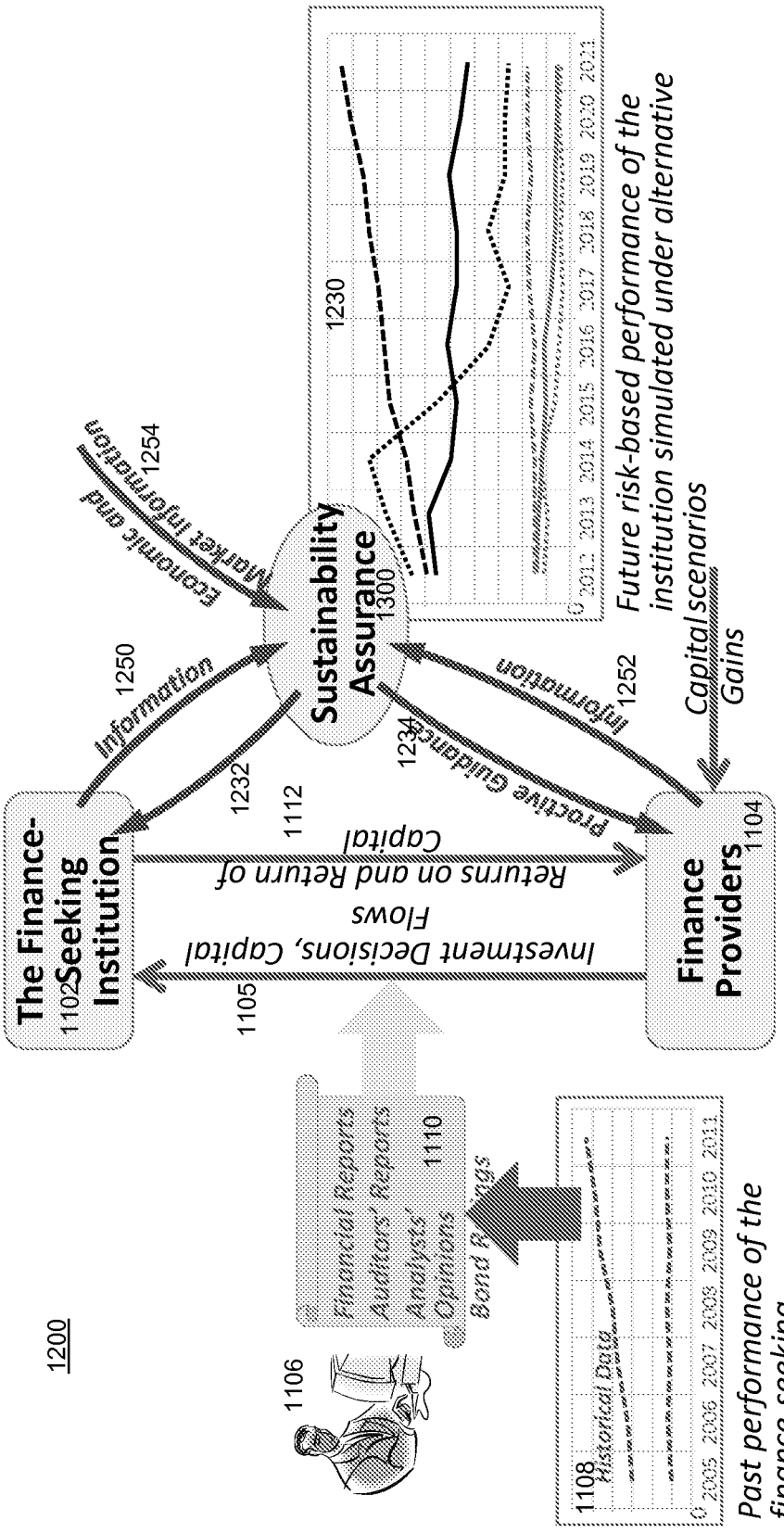

1200
The Finance-Seeking Institution
1102
Finance Providers
1104
Investment Decisions, Capital Flows
Returns on and Return of Capital
1105
1112
1232
Information
1250
Economic and Market Information
1254
Sustainability Assurance
1300
Protective Guidance
1234
Information
1252
Capital Gains
Future risk-based performance of the institution simulated under alternative scenarios
1230
2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Financial Reports
Auditors' Reports
Analysts' Opinions
Bond Ratings
1110
1106
Historical Data
1108
2005 2006 2007 2008 2009 2010 2011
Past performance of the finance-seeking Institution

FIG. 12

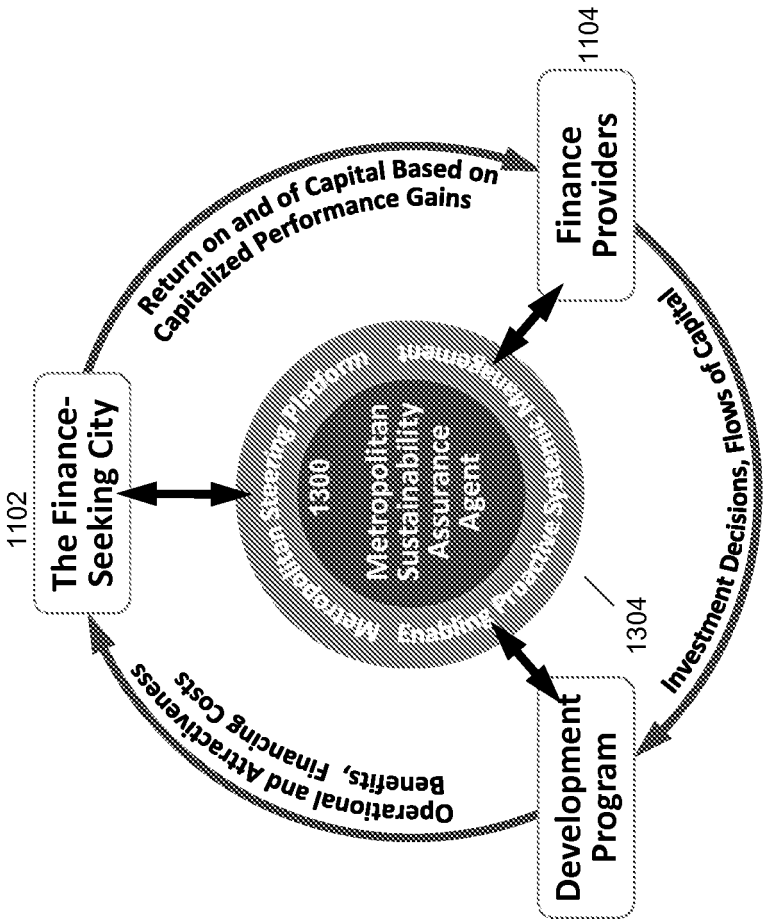

1102
The Finance-Seeking City
1104
Finance Providers
Development Program
1304
1300
Metropolitan Sustainability Assurance Agent
Metropolitan Strategic Platform
Shaping Projects, Programs, Investments
Return on and of Capital Based on Capitalized Performance Gains
Investment Decisions, Flows of Capital
Operational and Attractiveness Benefits, Financing Costs

FIG. 13

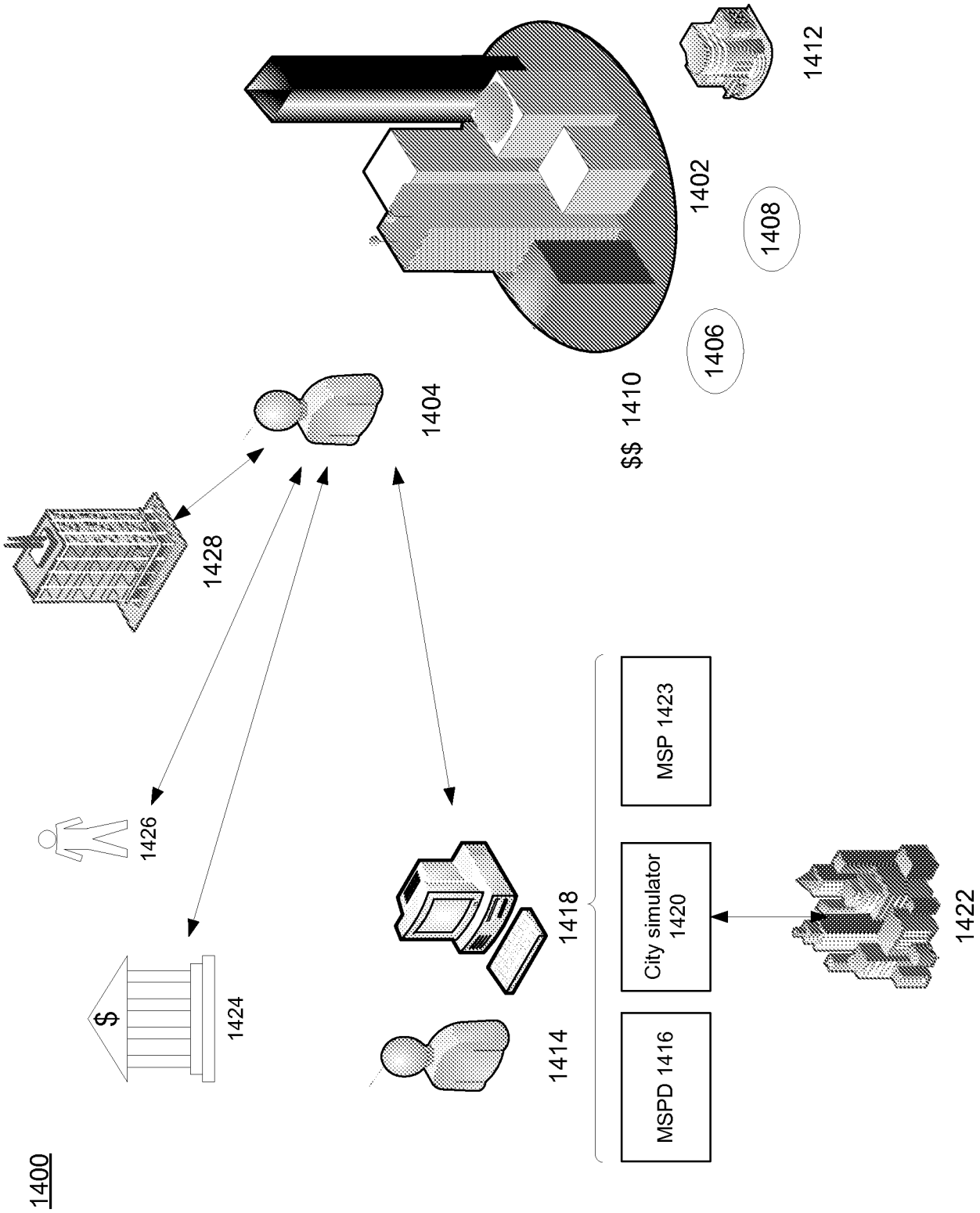

1400
1402
1404
1406
1408
1410
1412
1414
1418
1422
1424
1426
1428
$$
$
MSPD 1416
City simulator 1420
MSP 1423

FIG. 14

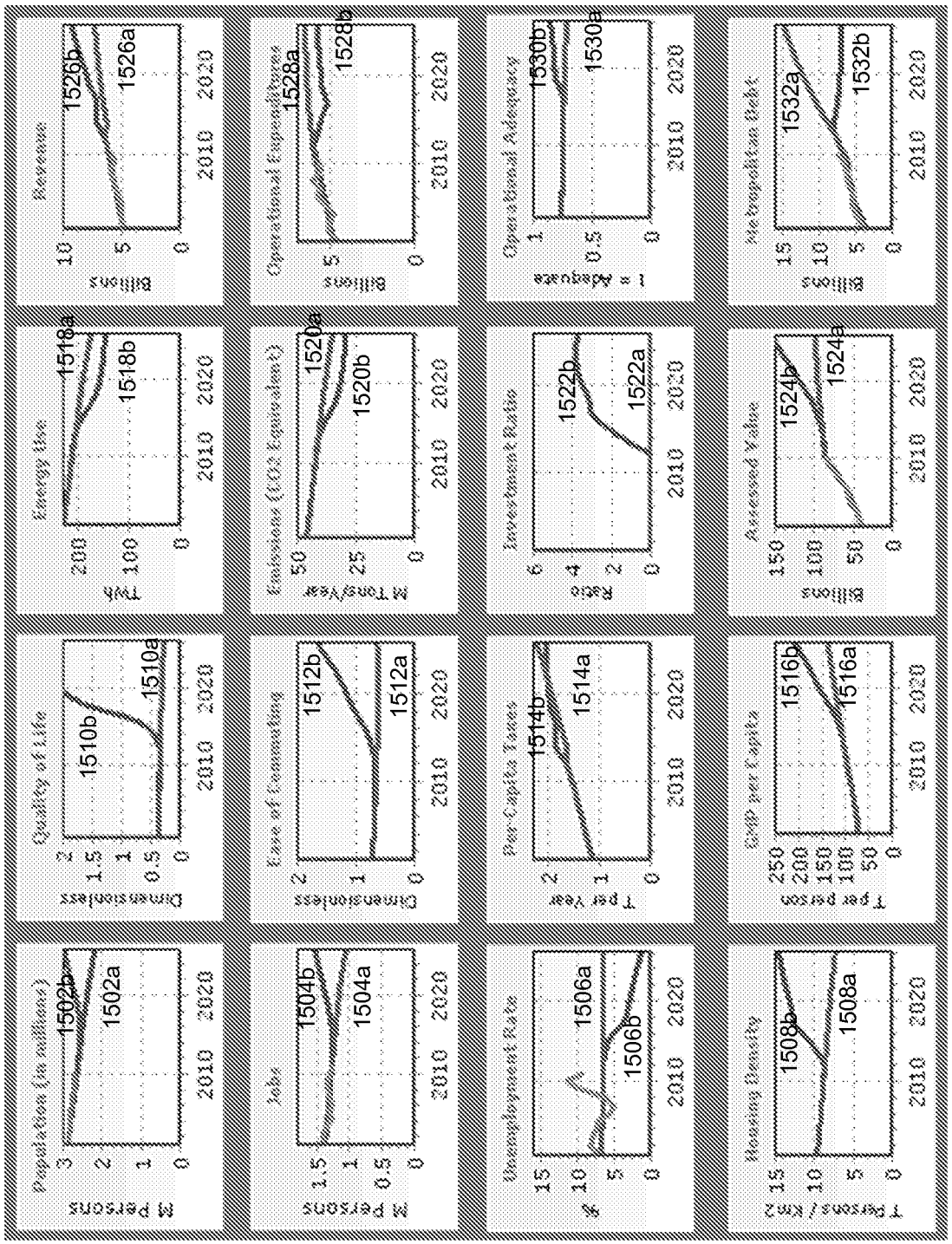

1500
Population (in millions)
1502b
1502a
M Persons
Quality of Life
1510b
1510a
Dimensionless
Energy Use
1518a
1518b
Revenue
1526b
1526a
Billions
Jobs
1504b
1504a
M Persons
Ease of Commuting
1512b
1512a
Dimensionless
Emissions (CO2 Equivalent)
1520a
1520b
M Tons/Year
Operational Expenditures
1528a
1528b
Billions
Unemployment Rate
1506a
1506b
%
Per Capita Taxes
1514b
1514a
T per Year
Investment Ratio
1522b
1522a
Ratio
Operational Adequacy
1530b
1530a
Dimensionless
Housing Density
1508b
1508a
T Persons / Km2
GDP per Capita
1516b
1516a
T per Person
Assessed Value
1524b
1524a
Billions
No Population Debt
1532a
1532b
Billions
2010
2020

FIG. 15

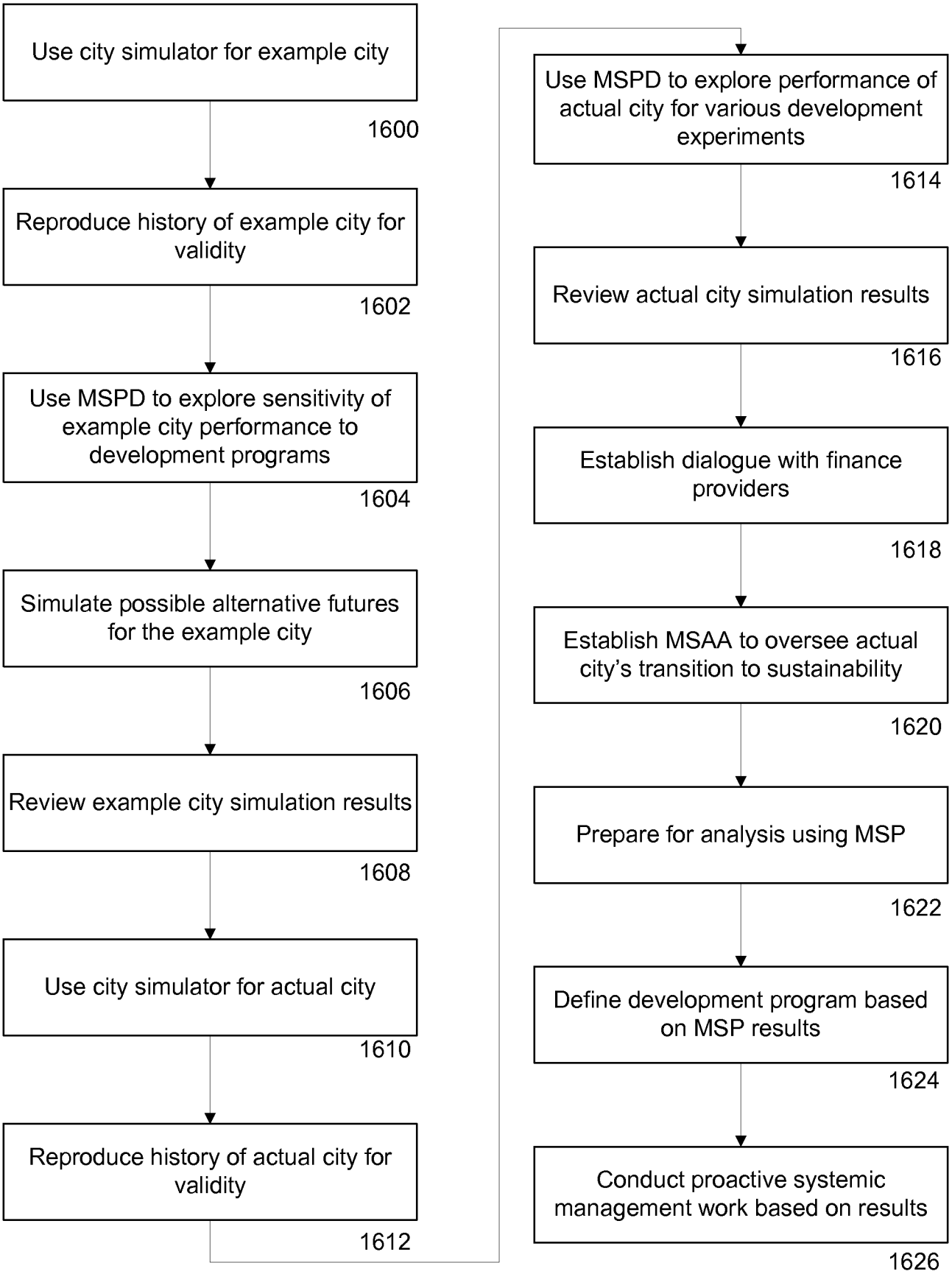

Use city simulator for example city
1600
Reproduce history of example city for validity
1602
Use MSPD to explore sensitivity of example city performance to development programs
1604
Simulate possible alternative futures for the example city
1606
Review example city simulation results
1608
Use city simulator for actual city
1610
Reproduce history of actual city for validity
1612
Use MSPD to explore performance of actual city for various development experiments
1614
Review actual city simulation results
1616
Establish dialogue with finance providers
1618
Establish MSAA to oversee actual city's transition to sustainability
1620
Prepare for analysis using MSP
1622
Define development program based on MSP results
1624
Conduct proactive systemic management work based on results
1626

FIG. 16