



# Research Agenda: Government Capital Account

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## Research Agenda

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- 1) Timing of transactions: Change in private inventories vs. government fixed investment
- 2) Work-in-progress: What it means for the measurement of government value added
- 3) Government inventories



# Topic 1

Timing of transactions:  
Change in private inventories vs.  
government fixed investment



## Timing of transactions: Change in private inventories vs. government fixed investment

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- BEA measures government fixed investment generally on a delivery basis
  - BEA measures work-in-progress as part of change in private inventories
  - When equipment is delivered to the government, BEA records government fixed investment and a decrease in private inventories
  - GDP for any one period is measured only as the work-in-progress for that period



# Assumptions

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- Contractors report work-in-progress to the Census Bureau for their Manufacturers' Shipments, Inventories and Orders statistics



## Question

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- Do contractors report work-in-progress to Census for aircraft, missiles, vehicles and other equipment?
  - Studies before the 1999 comprehensive revision indicated that some contractors do not report work-in-progress to Census
    - B-2 bomber, built by Northrop Grumman
      - BEA developed estimates of work-in-progress to augment statistics reported by the Census Bureau
      - No adjustments were made to delivery-based government investment



## Example: Contractors reporting as expected

- Defense Department buys a plane for \$40 million
- Assume it takes the contractor 1 year to build
- Work-in-progress is equally split over 4 quarters
- GDP is correct

	Q1	Q2	Q3	Q4
GDP	10	10	10	10
Inventory Change	10	10	10	-30
Government investment	0	0	0	40



## Example: Contractors not reporting

- Defense Department buys a plane for \$40 million
- Assume it takes the contractor 1 year to build
- Work-in-progress is equally split over 4 quarters
- GDP is understated in q1, q2 and q3 and overstated in q4

	Q1	Q2	Q3	Q4
GDP	0	0	0	40
Inventory Change	0	0	0	0
Government investment	0	0	0	40





## Research Agenda: Timing

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- Reassess the contractor reporting requirements
- Identify systems that are not reported to Census as work-in-progress
- Focus on larger defense programs
- Develop adjustments for the inventory estimates
  - Disbursements data by program from Department of Defense
  - Other data sources?



## Topic 2

Work-in-progress:

What it means for the measurement  
of government value added



## Work-in-progress: What it means for the measurement of government value added

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- Government fixed investment is recorded on a delivery basis
  - Exceptions:
    - Ships
    - Structures



## Ships

- Defense shipbuilding was never recorded as work-in-progress in the estimates for change in private inventories
- Prior to the recognition of government fixed investment, work-in-progress for defense ships was recorded as defense purchases
- Recognition of government investment during the 1995-96 comprehensive revision replaced ship purchases with ship fixed investment
  - Measured as work-in-progress



## Consumption of Fixed Capital (CFC)

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- With the introduction of government fixed investment, BEA recognized consumption of fixed capital as a partial measure of the services produced by the stock of investment
- Example: A battleship patrols the ocean, carrying sailors and marines who are producing defense services for the country
  - Compensation of the sailors and marines is part of the cost of producing that service
  - Using the ship is another cost of producing that services
    - Measured in part by CFC



## CFC and the SNA

- The SNA does not address the issue of CFC for military ships
  - 1993 SNA does not recognize most military equipment as investment
- The SNA does suggest that CFC is accounted for over the whole period a fixed asset is available for productive purposes
- The SNA recommends recording work-in-progress as change in inventories until the equipment or structure is completed



## Ship CFC

- Based on capital stock estimates where ship fixed investment is measured on a work-in-progress basis
- Ships require considerable time to build and are expensive
- Example:
  - Arleigh Burke destroyer
    - Costs about \$1 billion
    - Built in about 3 years
  - Current NIPA methodology would show CFC, or government services, for up to 3 years before this ship is actually put into service



## Research Agenda: Work-in-progress

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- Determine data sources available to measure ships on a delivery basis
- Assess the impact on the estimates to determine if a modified methodology creates statistically significant differences
- Determine accounting for work-in-progress in the structure of the government accounts
  - Change in government inventories





## Topic 3

# Government Inventories



## Government Inventories

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- SNA recommends presenting inventories as part of the capital account
- Definition:
  - Stocks of outputs that are still held by the units that produced them prior to their being further processed, sold, delivered to other units or used in other ways
  - Stocks of products acquired from other units that are intended to be used for intermediate consumption or for resale without further processing



## War and Government Consumption Expenditures

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- Recent wars
  - Gulf War, 1991
  - Afghanistan, 2001
  - Iraq, 2003
- Common question about the NIPA's
  - Why don't government consumption expenditures show a significant increase when the U.S. goes to war?



## War and Government Consumption Expenditures

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- Response
  - War is being fought from inventories
  - Until inventories are sufficiently depleted to necessitate a ramp up in production of these commodities, it is unlikely that a user would notice anything in government consumption expenditures
  - Exceptions:
    - Compensation
    - Travel and transportation
    - Petroleum



# Consumption Expenditures & Gross Investment

Consumption expenditures & gross investment

- Consumption expenditures
  - Gross output of general government
    - Value added
      - Compensation
      - Consumption of fixed capital
    - Intermediate goods and services purchased
      - Durable goods
      - Nondurable goods
      - Services
  - Less: Own-account investment and sales to other sectors
- Gross investment
  - Structures
  - Equipment and software

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  - Fixed investment
    - Structures
    - Equipment and software
  - Change in government inventories



## Examples: Compare and Contrast

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- Ammunition
  - An intermediate good used in the production of defense services
- Corn
  - A commodity that the Department of Agriculture acquires and sells as part of its farm support programs, specifically the Commodity Credit Corporation (CCC)
- Assume that the government acquires the commodity in the period when it is produced



# Ammunition

	T1	T2
Gross domestic product	50	50
Gross private domestic investment	0	0
Government consumption expenditures and gross investment	50	50
Consumption expenditures	0	200
Gross output of general government	0	200
Value added	0	0
Intermediate goods and services used	0	200
Durable goods	0	0
Nondurable goods	0	200
Ammunition	0	200
Services	0	0
Less: Own-account investment and sales to other sectors	0	0
Gross investment	50	-150
Fixed investment	0	0
Change in government inventories	50	-150
Ammunition purchased	50	50
Less: Ammunition used	0	200



## Ammunition

- Ammunition worth 50 is manufactured in periods t1 and t2
- In t2, war begins and ammunition inventories are drawn down
- The decrease in inventories is offset by an increase in nondurable goods used
- GDP is equal to 50 in both periods, recording only the amount of ammunition manufactured
- Government consumption expenditures would appear larger than in the current NIPA's





# Corn

	T1	T2
Gross domestic product	35	5
Gross private domestic investment	0	25
Government consumption expenditures and gross investment	35	-20
Consumption expenditures	0	0
Gross output of general government	0	0
Value added	0	0
Intermediate goods and services used	0	0
Durable goods	0	0
Nondurable goods	0	0
Ammunition	0	0
Services	0	0
Less: Own-account investment and sales to other sectors	0	0
Gross investment	35	-20
Fixed investment	0	0
Change in government inventories	35	-20
Corn purchased	35	5
Less: Corn sold	0	25



## Corn

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- Corn worth 35 and 5 is grown in periods  $t_1$  and  $t_2$ , respectively
  - In  $t_2$ , the government sells corn of 25 to wholesale and retail establishments
  - No impact on government consumption expenditures
  - Instead, change in private inventories is increased
  - GDP is equal to 35 and 5, respectively, recording only the amount of corn grown



## What do these examples show?

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- Recognizing an inventory measure for government would provide useful additional information about government transactions
- Different types of government inventories have different impacts on government consumption expenditures



## What's currently available?

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- BEA has information for a limited number of inventory transactions
  - Farm products held by the CCC
  - Crude oil held by the Strategic Petroleum Reserve (SPR)
- BEA has no information for most inventory transactions
  - Defense supplies and materials
  - Strategic and Critical Material stockpile



## A Government Inventory Measure

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- For an inventory measure to be truly useful, supplies and materials that are actively used in the production of government services need to be measured
- An inventory measure showing only items such as CCC and SPR provides little additional information than what can be seen in the current NIPA's
- BEA has not produced an inventory measure in the past because of data problems for supplies and materials
- Technology changes, combined with attempts to improve government financial statements, may provide prospects for new and improved source data



## Will we have the data that we need?

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- Currently, BEA classifies missiles as fixed investment
  - The Canberra II Group, which is discussing the next SNA volume, proposes that most missiles should be classified as inventories
- For war losses, an adjustment is made to reduce capital stocks
- BEA receives very detailed information about the production and delivery of most types of missiles
- However, BEA was unable to obtain information about war losses because the data were classified



## Research Agenda: Government Inventories

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- Focus initially on defense inventories
- Work with the Department of Defense to identify data sources
- Develop a methodology for the measurement of inventories



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