National Accounting

Giovanni Ricco

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Macroeconomic Data

Some Economic Data Sources

- FRED
- ALFRED: for vintage versions
- PHILLY FED: expectations and forecasts
- Penn World Tables
- ECB
- OECD
- BoE
- Data Portals: BLOOMBERG (Department), DATASTREAM (Library)
- Many more... FT, WSJ, Yahoo Finance,Google Trends!

GDP/GNI

- GDP combines in a single figure, with no double counting, all the output carried out by **firms**, **non-profit institutions**, **government bodies**, **households**, in a given country during a given period.
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- GDP: total production within the territory (excluding capital gains and losses)
- GNI: total income of agents residing within the territory
- GNI = GDP + Income received by resident units from abroad - Income transferred to units residing abroad
- Net measures(NDP, NNI): deduct consumption of fixed capital

Table 2. **Reconciliation of GDP and GNI for Germany, Luxembourg and Ireland**

Millions of euros

Year 2003	Germany	Luxembourg	Ireland
Gross domestic product	2 128 200	23 956	134 786
+ primary income (including earnings) received from the rest of the world	+104 610	+52 972	+30 296
– primary income (including earnings) paid to the rest of the world	–118 630	–55 722	–52 139
= Gross national income	2 114 180	21 206	112 943
Difference between GDP and GNI (%)	–0.7	–11.5	–16.2

Source: OECD (2006), *National Accounts of OECD Countries: Volume I, Main Aggregates*, 1993-2004, 2006 Edition, OECD, Paris.

StatLink: *http://dx.doi.org/10.1787/783541142830*

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- Does GDP adequately reflect economic activity? NNI growth amounted to "only" 6.4 percent in nominal terms.

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- **Income approach**: GDP = sum of income(mostly from non-farm payroll employment) = compensation of employees + company profits

Table 5. **The three approaches to GDP**

Germany, billion euros

Codes[1]		1991	2004
GDP	Gross domestic product (output approach)	1 502.2	2 177.0
B1B	Value added at base-year prices	1 359.5	1 965.1
D21	+ taxes net of subsidies on the products	142.7	211.9
GDP	Gross domestic product (demand approach)	1 502.2	2 177.0
P3	Final consumption expenditure	1 140.9	1 677.5
P5	+ Gross capital formation	364.9	385.5
P6	+ Exports of goods and services	395.2	834.8
P7	– Imports of goods and services	398.7	720.8
GDP	Gross domestic product (income approach)	1 502.2	2 177.0
D1	Compensation of employees	844.0	1 133.1
B2 + B3	+ Gross operating surplus and gross mixed income	515.1	811.9
D2	+ Taxes net of subsidies on production and imports	143.1	232.1

1. These are the official SNA codes

Source: OECD (2006), *National Accounts of OECD Countries: Volume I, Main Aggregates,* 1993-2004, 2006 Edition, OECD, Paris.

StatLink: *http://dx.doi.org/10.1787/400886162203*

Expenditures: Investment and Private Consumption

- *Gross capital formation*: machinery (including softwares), buildings (offices, infrastructure, dwellings), inventories (constitution of stocks)
- *Gross fixed capital formation* = Gross Capital Formation - Inventories
- *Household final consumption expenditure*: food, clothing, housing services (rents), energy, durable, goods (notably cars), spending on health, on leisure and on miscellaneous services

  $\rightarrow$ purchase of dwellings excluded: not intended to be consumed DURING that period

Table 4. **GDP: expenditure approach**

Germany, 2004[a]

Codes		Million euros	% of GDP
GDP	Gross domestic product	2 177 000	
P3	**Total final consumption**	**1 677 450**	
	of which:		
P31-S14	Household final consumption expenditure	1 225 870	56.3
P31-S15	Final consumption of NPISHs	44 900	2.1
P31-S13	General government final consumption expenditure	406 680	18.7
P5	**Gross capital formation**	**385 480**	
	of which:		
P51	Gross fixed capital formation	378 550	17.4
P52	Changes in inventories	6 930	
B11	**External balance of goods and services**	**114 070**	
	of which:		
P6	Exports	834 820	38.3
P7	Imports	720 750	33.1

a) This table shows the official SNA codes, which the reader can find on the website accompanying this book. These codes facilitate the understanding and manipulation of the data.

Source: OECD (2006), *National Accounts of OECD Countries: Volume I, Main Aggregates*, 1993-2004, 2006 Edition, OECD, Paris.

StatLink: *http://dx.doi.org/10.1787/502048533886*

National Account 'Statistics'

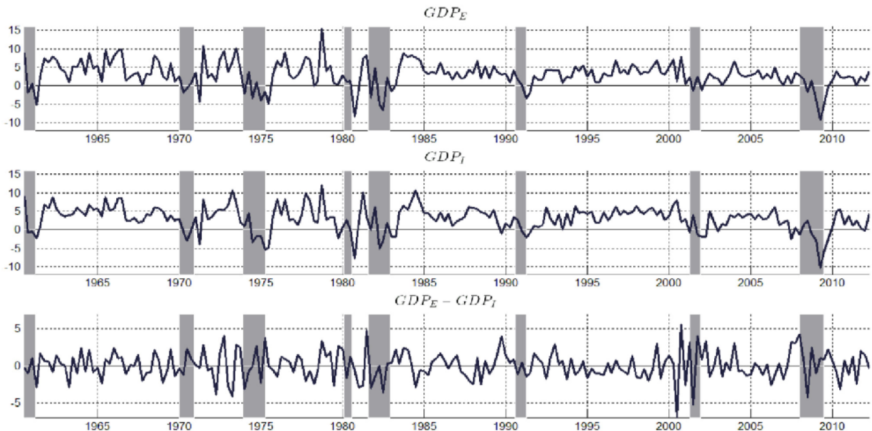
- National accounts better thought as **statistics**: approximation, estimation, revisions.
- Highly dependent on quality of the statistical system in each country
- **Private sector(firms)**

  Tax files are the main source of information about firms - calculate the value added for each firm or group of firms.
- **Public sector** (Central government and local authorities)
- **Problem: Households.** indirect measures using other sources

  e.g. compensation of employees received by HH = compensation paid out by firms + public units

Measurement Error

Aruoba et al (2016): Improving GDP measurement. A measurement-error perspective



Measurement Error

- true GDP as a latent variable on which we have several indicators, the two most obvious being GDP_E and GDP_I, as we then extract true GDP using optimal filtering techniques
- Kalman smoother will derive optimal extraction of GDP conditional upon observed expenditure and income side measurements

Conventions and Pitfalls

- Households internal production (cooking, cleaning) not covered in the national accounts
- The national accounts assume that services of the general government are final uses, but they might better be thought as intermediate consumption
- Counting softwares as gross fixed capital income and not as intermediate consumption led to an upward revision of 1-4 percentage points of GDP
- GDP is not a measure of welfare: it rises if there are more road accidents.. greater activity of emergency services!
- ..and does not represent National Wealth: a natural catastrophe per se may even increase GDP today

Implications

- Suppose the government decides to reduce income tax and correspondingly increase VAT(less painful tax)- leaving the deficit unchanged
- Final demand includes household consumption, which is measured at market prices and includes VAT, GDP will be increased.
- The precise origin of government financing matters!
  Example: It can affect for example the EU Maastricht public deficit criterion without any change in the deficit itself!

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- Every few years the BEA releases a **benchmark** or **comprehensive revision**

Data Revisions

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- Revisions **are predictable** using the information set at the time of the announcement

Volume/Price breakdown

- We are interested in Real GDP (*GDP volume*): need to separate out part of growth that stems from *a change in quantities* from the part due to *a change in prices*
- Problem of Aggregation: quantities are not a good measure- quality?
  $\rightarrow$ Relative prices give information about relative quality
- To calculate volumes, national accountants sum physical units weighted by the prices of these units
- Volume in national accounts measures not the increase in quantity, but the utility

Volume/Price Breakdown

- Another problem: hard to compare different periods, since prices vary at the same time as quantities

  $\rightarrow$ Need to "freeze" the variation in prices- use the same price structure

  Compare $(Q_{1,t} \cdot P_1) + (Q_{2,t} \cdot P_2)$ and $(Q_{1,t+1} \cdot P_1) + (Q_{2,t+1} \cdot P_2)$

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- still- new products? quality improvements?

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- However, the choice of a fixed year means using price structures that become more and more remote from current structure
- Change in relative prices can change quantities and this tends to overstate, understate volumes (e.g. computer)

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- **Problem: type Y did not even exist in year t, so that no price is available to provide the weighting**.

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- They estimate what a computer of type Y would have cost in year t, had it existed.

Distortion due to Constant Price

Example

- Suppose the price of type Y is estimated to be 20% higher than that of type X in year t. $\rightarrow$ Realistic hypothesis, since PC prices fall very rapidly even when their performance increases
- Volume of computers in national accounts for year t+1 will therefore calculated "at year t prices", i.e. at prices that are 20% higher.
- volume of computers measured therefore rises much faster than the number of computers bought $\rightarrow$ overstatement.

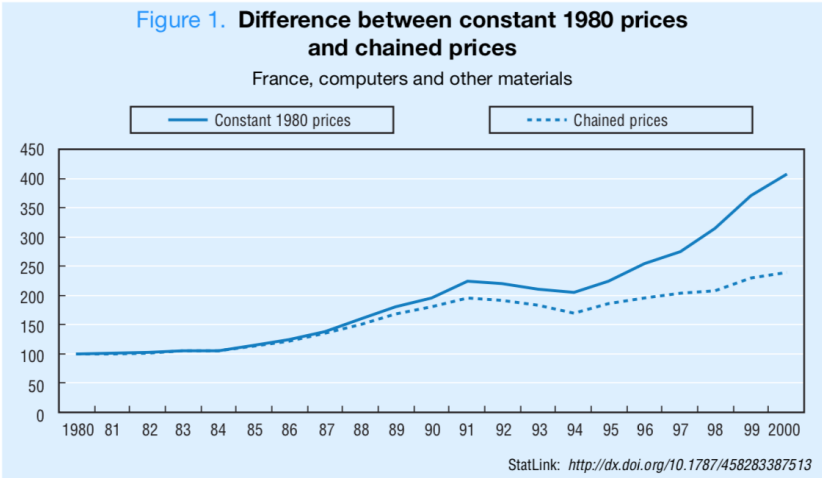
Constant v. Chained Price Series – Alternatives

- Chain-linking methods

  Idea : obtain a series of growth rates, each of which uses the price structure of the previous period. More relevant structure than that of a fixed period from further past

- Fisher Chains (Canada and US): use the average price structure of previous and current period

Constant v. Chained Price Series



Measuring Services: the Case of Banking

- Services become increasingly important part of economy, but the output data for many of services are weak- particularly banking
- In general financial intermediation services cover two parts:
  - financial intermediation services directly charged by financial intermediaries to their clients (fees + commission)
  - "FISIM" : *Financial Intermediation Services Indirectly Measured*, computed as lending rate - reference rate
- **Implication: compensation for bearing credit default risk and the term premium is treated as a productive service and this becomes part of GDP**

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- The risk premium on loans is only a transfer, through banks, of property income from borrowers to savers, and is not part of banks' value added

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- Hence, the implicit revenue should equal the spread of the gross loan interest rate over the yield on an equally risky fixed-income security, not a risk-free security such as a Treasury bill or bond
- Typical statistical practice overstates total bank output by 21 percent. U.S. GDP would have been 0.3% lower on average over 1997 – 2007.

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- seasonal factor is an unobserved component that can be estimated but never perfectly identified

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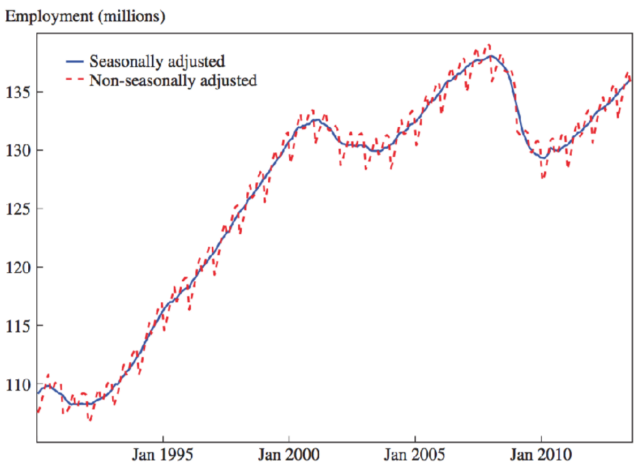
Figure 1. Nonfarm Payrolls Employment: Seasonally Adjusted and Unadjusted, 1990–2013



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- In each year from 2010 to 2013, there has been a tendency for strong economic growth in the early spring being followed by a summer of discontent. Part of this phenomenon could be due to seasonal factors.

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Figure 3. Estimated Effect of Recession-Induced Seasonal Distortion on Monthly Payroll Levels, July 2009–April 2013