Analysis of Economic Data

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Lecture Outline

Introduction

- Economic data may be compiled by government agencies (e.g. GDP and unemployment rates), collected from survey studies (e.g. Survey of Family Income and Expenditure), or recorded by some electronic systems (e.g. stock market transaction data).

- The data may be time-series data recorded over a period of time, cross-section data recorded across different units (households, firms, or countries) at a particular time point, or panel data recorded across different units over a period of time.

- Econometrics is mainly concerned with analyzing economic data based on some economic theory or hypothesis.

Annual Data of Taiwan's GDP: 1951–2013
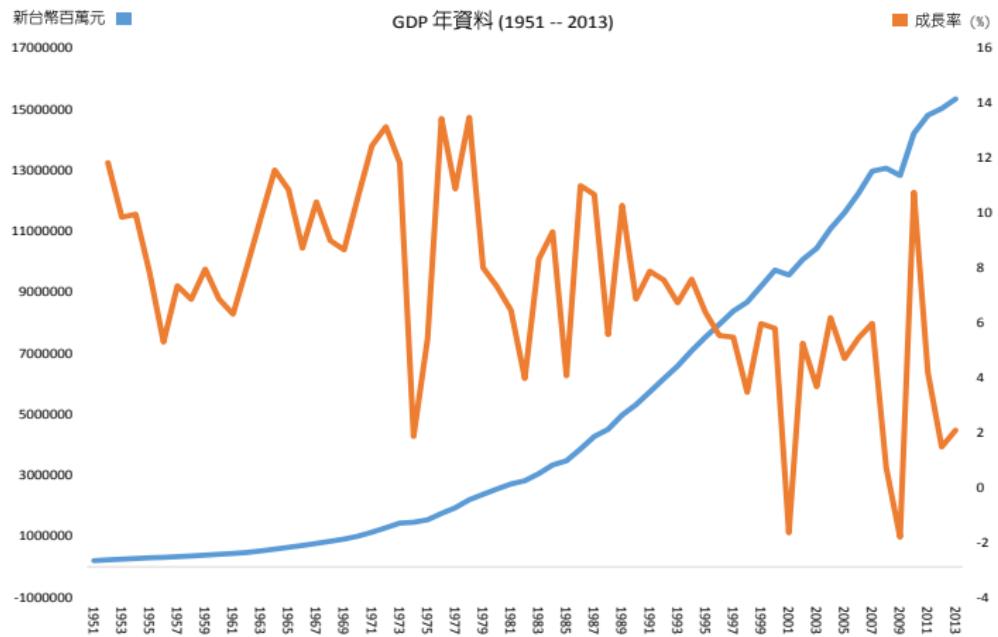
GDP and its growth rates

# Annual Data of Taiwan's Unemployment Rates: 1978–2013
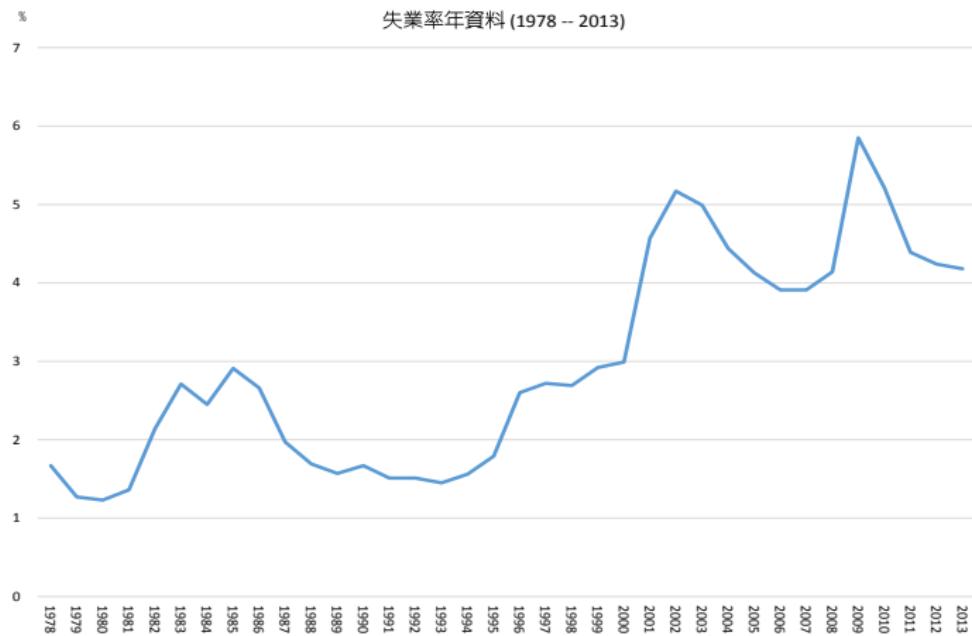
Unemployment rates

Annual Data of GDP Components: 1951–2013
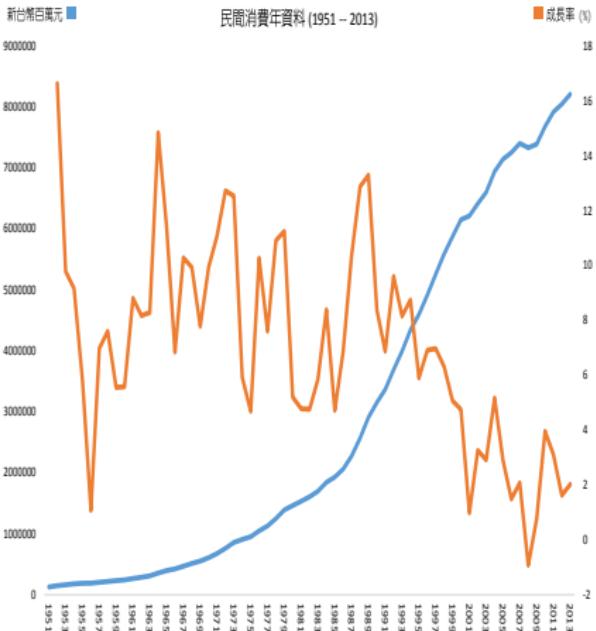
(a) Private consumption
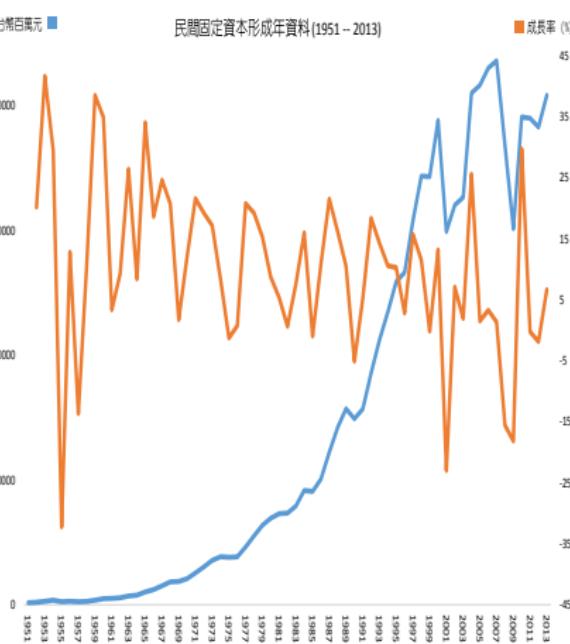
(b) Private investment

Quarterly Data of Taiwan's GDP: 1961Q1–2014Q2
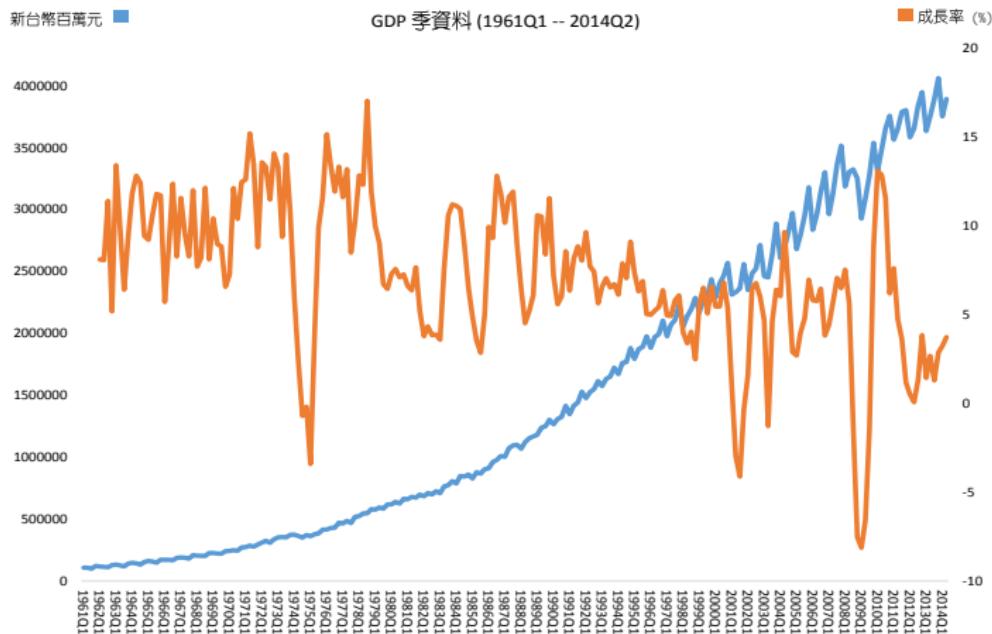
Seasonally unadjusted GDP and its YoY growth rates

SA Quarterly Data of Taiwan's GDP: 1981Q1–2014Q2
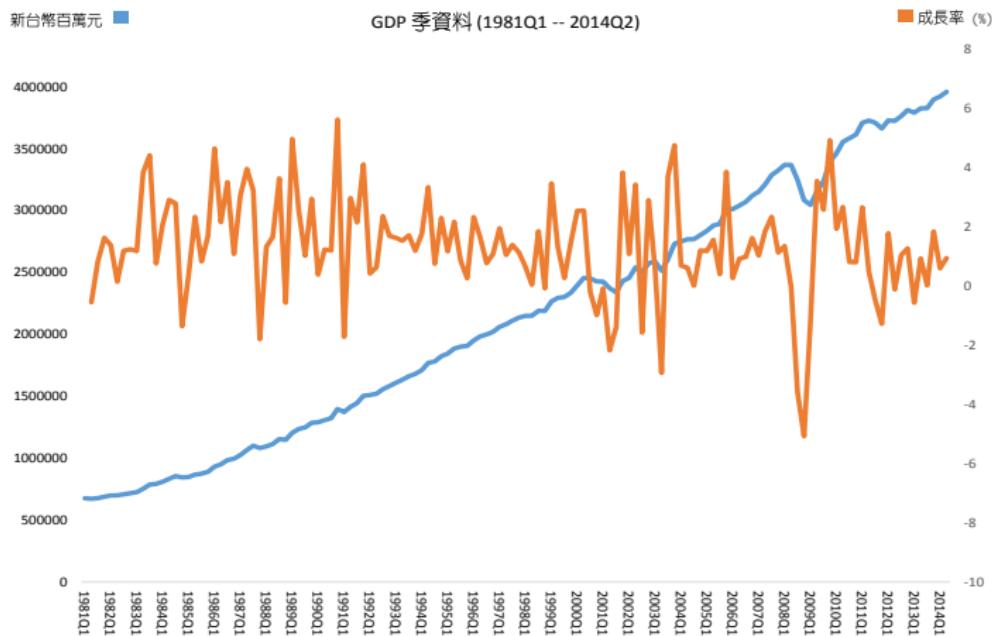
Seasonally adjusted GDP and its QoQ growth rates

Summary Statistics of Annual GDP Growth Rates

Stat.	52–13	52–59	60–69	70–79	80–89	90–99	00–09
Avg	7.28	8.37	9.03	10.12	7.70	6.35	3.43
S.d.	3.44	2.07	1.68	3.88	2.64	1.32	3.15
Max	13.49	11.84	11.57	13.49	11.00	7.88	6.19
Min	−1.81	5.30	6.32	1.86	3.97	3.47	−1.81

Summary Statistics of Annual Unemployment Rates

Stat.	78–13	80–89	90–99	00–09
Avg	2.95	2.07	2.04	4.41
S.d.	1.36	0.60	0.61	0.79
Max	5.85	2.91	2.92	5.85
Min	1.23	1.23	1.45	2.99

Summary Statistics of Annual Consumption Growth Rates

Stat.	52–13	52–59	60–69	70–79	80–89	90–99	00–09
Avg	7.02	7.82	9.19	9.69	7.71	7.29	2.34
S.d.	3.72	4.45	2.61	2.73	3.37	1.40	1.86
Max	16.63	16.63	14.84	12.72	13.29	9.60	5.17
Min	−0.93	1.07	5.58	4.68	4.71	5.07	−0.93

Summary Statistics of Annual Investment Growth Rates

Stat.	52–13	52–59	60–69	70–79	80–89	90–99	00–09
Avg	10.24	13.45	18.22	13.34	9.65	8.36	−0.27
S.d.	14.05	25.52	12.09	8.23	7.02	7.47	14.91
Max	41.69	41.69	34.92	21.63	21.53	18.40	25.62
Min	−32.24	−32.24	1.73	−1.25	−0.95	−5.09	−22.98

Summary Statistics of Quarterly GDP Growth Rates (YoY)

Stat.	62Q1–14Q2	62–69	70–79	80–89	90–99	00–09
Avg	7.14	9.68	10.15	7.71	6.35	3.47
S.d.	4.22	2.18	4.55	2.91	1.54	4.47
Max	17.06	13.43	17.06	12.83	9.66	9.67
Min	-8.12	5.20	-3.40	2.86	2.50	-8.12

Summary Statistics of SA GDP Growth Rates (QoQ)

Stat.	82Q1–14Q2	82–89	90–99	00–09
Avg	1.37	1.98	1.51	0.96
S.d.	1.72	1.66	1.25	2.21
Max	5.64	4.98	5.64	4.94
Min	-5.07	-1.79	-1.71	-5.07

- Two leading indices that characterize Income inequality are: Gini cofficient and Oshima index (income ratio of the high and low income groups).


最高低所得比和吉尼係數 (1964 -- 2013)
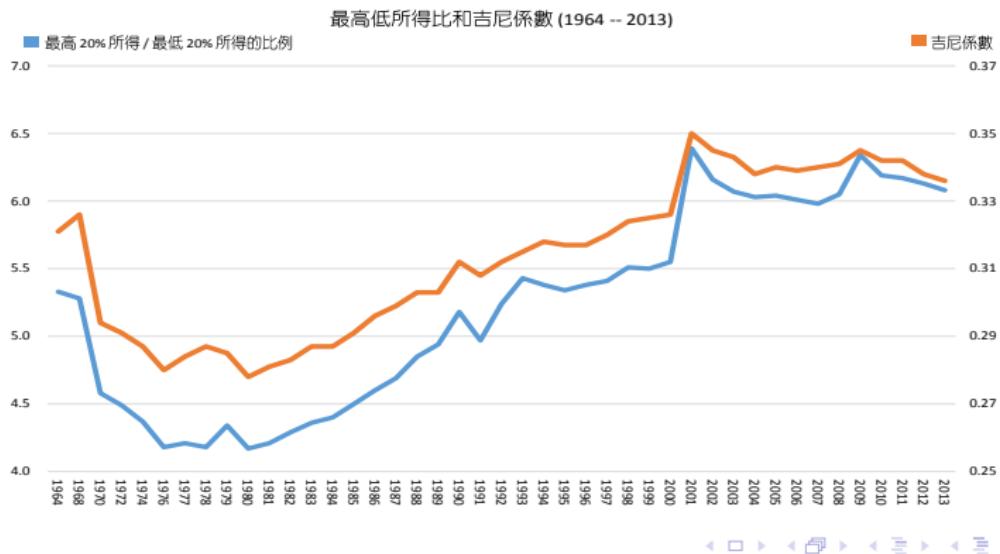
Summary Statistics of Gini Coefficient and Oshima Index

| Index	Stat.	70–13	70–79	80–89	90–99	00–09
	Avg	0.31	0.29	0.29	0.32	0.34
Gini	S.d.	0.02	0.00	0.01	0.01	0.01
Coefficient	Max	0.35	0.29	0.30	0.33	0.35
	Min	0.28	0.28	0.28	0.31	0.33
	Avg	5.22	4.34	4.50	5.33	6.06
Oshima	S.d.	0.75	0.16	0.26	0.16	0.23
Index	Max	6.39	4.58	4.94	5.51	6.39
	Min	4.17	4.18	4.17	4.97	5.55

Real income distributions (left) and their standardized versions (right)

Summary Statistics of Some Household Characteristics

Variable	Group	1980	1990	2000	2005
Saving	Lowest 20%	0.155	0.095	0.076	-0.001
rate	Highest 20%	0.378	0.359	0.275	0.270
Age of	Lowest 20%	43.9	51.3	58.4	61.7
Head	Highest 20%	43.0	43.3	45.1	45.8
Size of	Lowest 20%	3.66	2.66	1.93	1.87
Household	Highest 20%	5.67	4.96	4.50	4.24

Note: All numbers in the columns 3–6 are the averages of the observations in a particular group.

Age Distributions of the Head of Household
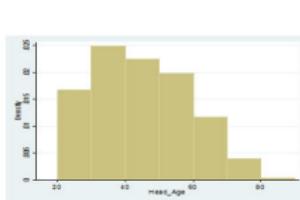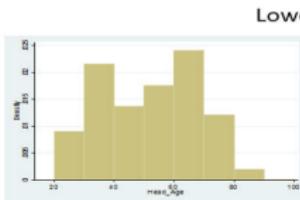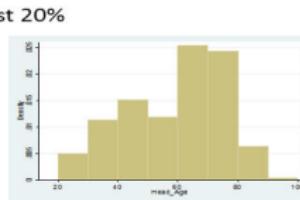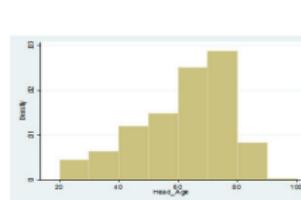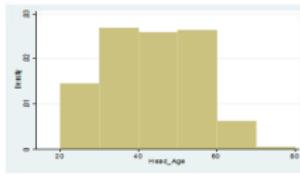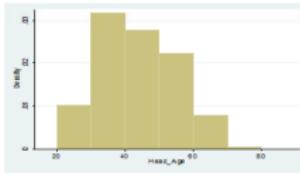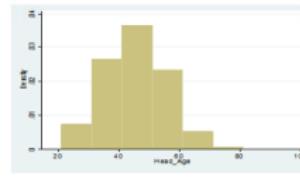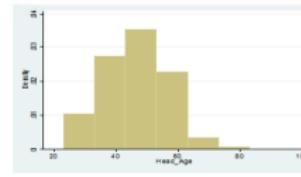
Some Remarks

- One may examine economic data using summary statistics that do not depend on the information of other economic variables. These statistics are unconditional, in the sense that they do not vary with other variables.

- It is more important to analyze the behavior of a variable, conditional on other economic variables; econometric (regression) analysis does exactly this.

- A conditional analysis enables us to understand the behavior of the variable of interest when the conditioning variables change. This is particularly important for, e.g., forecasting or policy decision.