ECON 753 Problem Set 1

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Problem 1

Part A

Replication of Table A1

```
library(knitr)
kable(A1)
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Category	I-O Industry	Weights
Bioenergy	Agriculture, Hunting, Forestry and Fishing	50.0
Bioenergy	Coke, Refined Petroleum and Nuclear Fuel	12.5
Bioenergy	Construction	25.0
Bioenergy	Education	12.5
Solar	Basic Metals and Fabricated Metal	17.5
Solar	Electrical and Optical Equipment	35.0
Solar	Construction	30.0
Solar	Education	17.5
Wind	Rubber and Plastics	12.0
Wind	Basic Metals and Fabricated Metal	12.0
Wind	Electrical and Optical Equipment	43.0
Wind	Construction	26.0
Wind	Education	7.0
Geothermal	Mining and Quarrying	15.0
Geothermal	Electrical and Optical Equipment	10.0
Geothermal	Construction	45.0
Geothermal	Education	30.0
Hydro	Other Non-Metallic Mineral	18.2
Hydro	Electrical and Optical Equipment	21.0
Hydro	Construction	18.2
Hydro	Education	42.9
Weatherization and Building Retrofits	Construction	100.0
Industrial Energy Efficiency	Electrical and Optical Equipment	50.0
Industrial Energy Efficiency	Construction	20.0
Industrial Energy Efficiency	Education	30.0
Grid Upgrades	Electrical and Optical Equipment	75.0
Grid Upgrades	Construction	25.0
Coal	Mining and Quarrying	50.0

Category	I-O Industry	Weights
Coal	Chemicals and Chemical Products	50.0
Oil and Gas	Mining and Quarrying	50.0
Oil and Gas	Coke, Refined Petroleum and Nuclear Fuel	50.0
Renewable Energy	Bioenergy	20.0
Renewable Energy	Solar	20.0
Renewable Energy	Wind	20.0
Renewable Energy	Geothermal	20.0
Renewable Energy	Hydro	20.0
Energy Efficiency	Weatherization and	
Building Retrofits	50.0	
Energy Efficiency	Industrial Energy Efficiency	25.0
Energy Efficiency	Grid Upgrades	25.0
Fossil Fuel	Coal	50.0
Fossil Fuel	Oil and Gas	50.0

Replication of Table 10

```
library(knitr)
kable(T10)
```

energy_names	Direct Jobs	Indirect Jobs	Direct + Indirect Jobs
Bioenergy	562.58296	61.18570	623.7687
Solar	98.50743	97.50735	196.0148
Wind	75.10361	117.85742	192.9610
Geothermal	145.48118	79.51790	224.9991
Hydro	144.78122	76.14726	220.9285
Weighted Average for Renewables	205.29128	86.44313	291.7344
Weatherization	159.11415	121.08790	280.2021
Industrial Energy Efficiency	105.51909	88.12674	193.6458
Smart Grids	58.69619	115.24087	173.9371
Weighted Average for Efficiency	120.61090	111.38585	231.9967
Coals	49.47604	87.70103	137.1771
Oil and Gas	34.24322	86.81066	121.0539
Weighted Average for Fossil Fuels	41.85963	87.25585	129.1155

Replication of Table 11

```
library(knitr)
kable(T11_4)
```

Source	Jobs per million USD
Renewable Energy	291.7344
Energy Efficiency	231.9967
Fossil Fuels	129.1155
Clean Energy Total	261.8656
Clean Energy relative to Fossil Fuels	102.8150

Part B

Table A1 with my new weights

```
library(knitr)
kable(A1_A1)
```

Category	I-O Industry	Weights
Bioenergy	Agriculture, Hunting, Forestry and Fishing	50
Bioenergy	Coke, Refined Petroleum and Nuclear Fuel	20
Bioenergy	Construction	15
Bioenergy	Education	15
Solar	Basic Metals and Fabricated Metal	25
Solar	Electrical and Optical Equipment	25
Solar	Construction	25
Solar	Education	25
Wind	Rubber and Plastics	20
Wind	Basic Metals and Fabricated Metal	15
Wind	Electrical and Optical Equipment	30
Wind	Construction	10
Wind	Education	25
Geothermal	Mining and Quarrying	15
Geothermal	Electrical and Optical Equipment	10
Geothermal	Construction	45
Geothermal	Education	30
Hydro	Other Non-Metallic Mineral	35
Hydro	Electrical and Optical Equipment	25
Hydro	Construction	25
Hydro	Education	15
Weatherization and Building Retrofits	Construction	100
Industrial Energy Efficiency	Electrical and Optical Equipment	70
Industrial Energy Efficiency	Construction	20
Industrial Energy Efficiency	Education	10
Grid Upgrades	Electrical and Optical Equipment	50
Grid Upgrades	Construction	50
Coal	Mining and Quarrying	75
Coal	Chemicals and Chemical Products	25
Oil and Gas	Mining and Quarrying	30
Oil and Gas	Coke, Refined Petroleum and Nuclear Fuel	70
Renewable Energy	Bioenergy	20
Renewable Energy	Solar	20
Renewable Energy	Wind	20
Renewable Energy	Geothermal	20
Renewable Energy	Hydro	20
Energy Efficiency	Weatherization and Building Retrofits	50
Energy Efficiency	Industrial Energy Efficiency	25
Energy Efficiency	Grid Upgrades	25
Fossil Fuel	Coal	50
Fossil Fuel	Oil and Gas	50

Replication of Table 10 with alternative weights at the subsectoral level

```
library(knitr)
kable(A1_T10)
```

energy_names	Direct Jobs	Indirect Jobs	Direct + Indirect Jobs
Bioenergy	551.76192	59.48581	611.2477
Solar	106.00577	89.35041	195.3562
Wind	86.96998	107.14901	194.1190
Geothermal	145.48118	79.51790	224.9991
Hydro	121.19335	100.55646	221.7498
Weighted Average for Renewables	202.28244	87.21192	289.4944
Weatherization	159.11415	121.08790	280.2021
Industrial Energy Efficiency	69.84080	105.94296	175.7838
Smart Grids	92.16884	117.18988	209.3587
Weighted Average for Efficiency	120.05949	116.32716	236.3866
Coals	58.98124	65.30360	124.2848
Oil and Gas	20.54593	104.37245	124.9184
Weighted Average for Fossil Fuels	39.76359	84.83803	124.6016

Replication of Table 10 with alternative weights at the subsectoral level

```
library(knitr)
kable(head(A1_T11_4))
```

Source	Jobs per million USD
Renewable Energy	289.4944
Energy Efficiency	236.3866
Fossil Fuels	124.6016
Clean Energy Total	262.9405
Clean Energy relative to Fossil Fuels	111.0250

Now with different weights at the sectoral level Table A1

```
library(knitr)
kable(A2_A1)
```

Category	I-O Industry	Weights
Bioenergy	Agriculture, Hunting, Forestry and Fishing	50.0
Bioenergy	Coke, Refined Petroleum and Nuclear Fuel	12.5
Bioenergy	Construction	25.0
Bioenergy	Education	12.5
Solar	Basic Metals and Fabricated Metal	17.5
Solar	Electrical and Optical Equipment	35.0
Solar	Construction	30.0
Solar	Education	17.5
Wind	Rubber and Plastics	12.0
Wind	Basic Metals and Fabricated Metal	12.0

Category	I-O Industry	Weights
Wind	Electrical and Optical Equipment	43.0
Wind	Construction	26.0
Wind	Education	7.0
Geothermal	Mining and Quarrying	15.0
Geothermal	Electrical and Optical Equipment	10.0
Geothermal	Construction	45.0
Geothermal	Education	30.0
Hydro	Other Non-Metallic Mineral	18.2
Hydro	Electrical and Optical Equipment	21.0
Hydro	Construction	18.2
Hydro	Education	42.9
Weatherization and Building Retrofits	Construction	100.0
Industrial Energy Efficiency	Electrical and Optical Equipment	50.0
Industrial Energy Efficiency	Construction	20.0
Industrial Energy Efficiency	Education	30.0
Grid Upgrades	Electrical and Optical Equipment	75.0
Grid Upgrades	Construction	25.0
Coal	Mining and Quarrying	50.0
Coal	Chemicals and Chemical Products	50.0
Oil and Gas	Mining and Quarrying	50.0
Oil and Gas	Coke, Refined Petroleum and Nuclear Fuel	50.0
Renewable Energy	Bioenergy	40.0
Renewable Energy	Solar	40.0
Renewable Energy	Wind	10.0
Renewable Energy	Geothermal	5.0
Renewable Energy	Hydro	5.0
Energy Efficiency	Weatherization and Building Retrofits	20.0
Energy Efficiency	Industrial Energy Efficiency	40.0
Energy Efficiency	Grid Upgrades	40.0
Fossil Fuel	Coal	70.0
Fossil Fuel	Oil and Gas	30.0

Table 10

```
library(knitr)
kable(head(A2_T10))
```

energy_names	Direct Jobs	Indirect Jobs	Direct + Indirect Jobs
Bioenergy	562.58296	61.18570	623.7687
Solar	98.50743	97.50735	196.0148
Wind	75.10361	117.85742	192.9610
Geothermal	145.48118	79.51790	224.9991
Hydro	144.78122	76.14726	220.9285
Weighted Average for Renewables	286.45964	83.04622	369.5059

Table 11

```r
library(knitr)
kable(head(A2_T11_4))
```

Source	Jobs per million USD
Renewable Energy	369.5059
Energy Efficiency	203.0736
Fossil Fuels	132.3401
Clean Energy Total	286.2897
Clean Energy relative to Fossil Fuels	116.3288

Poblem 2

1 Replication of figure 2 RR

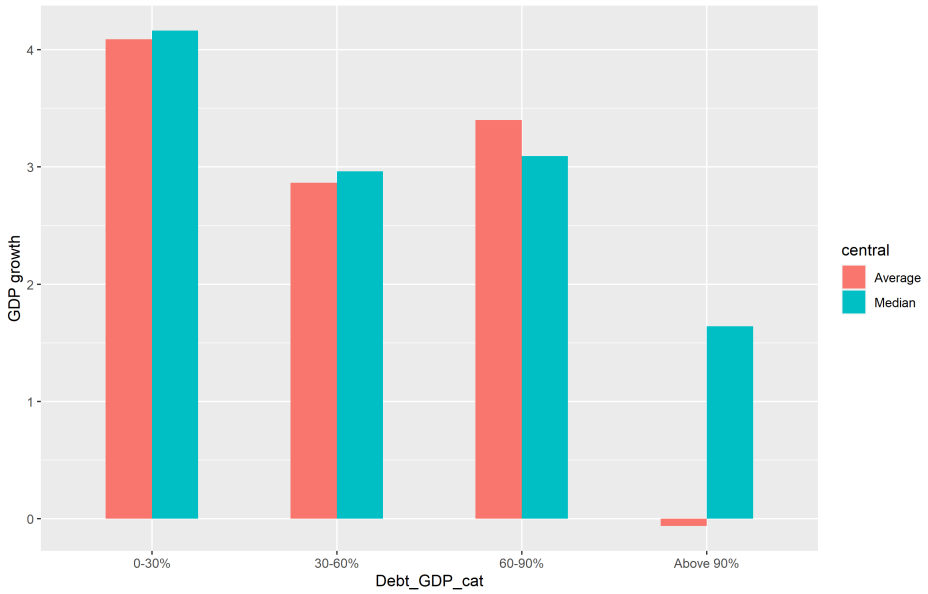

Figure 1: Figure 2 RR

2. Show the prevalence of the four public-debt categories for the sample of countries over time.Show the real GDP growth rate for the sample of countries over time. Discuss any patterns thatyou observe.

```r
library(knitr)
kable(prev_1)
```

Country	0-30%	30-60%	60-90%	Above 90%
Australia	37	13	9	5
Austria	34	25	0	0

Country	0-30%	30-60%	60-90%	Above 90%
Belgium	0	17	21	25
Canada	3	42	14	5
Denmark	23	16	17	0
Finland	44	16	4	0
France	24	20	10	0
Germany	48	11	0	0
Greece	13	5	3	19
Ireland	10	14	32	7
Italy	26	6	17	10
Japan	22	17	4	11
Netherlands	17	34	2	0
New Zealand	9	33	17	5
Norway	51	12	1	0
Portugal	42	9	7	0
Spain	5	36	1	0
Sweden	18	35	11	0
UK	0	38	6	19
US	0	37	23	4

```
library(knitr)
kable(prev_2)
```

0-30%	30-60%	60-90%	Above 90%
426	436	199	110

Prevalence of Real GDP Growth

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library(knitr)
kable(prevGDP)
```

Country	1946-1950	1951-1960	1961-1970	1971-1980	1981-1990	1991-2000	2000-2010
Australia	3.7742505	4.057079	5.286783	3.310568	3.246736	3.441959	2.8755253
Austria	19.5468645	6.028140	4.720503	3.644882	2.316075	2.557066	1.7560900
Belgium	7.7478861	2.641468	5.127077	3.573654	2.057382	2.349175	1.2918860
Canada	2.9566400	4.620591	5.079180	4.273472	2.535731	3.710663	1.8610558
Denmark	7.9458545	3.163720	4.499750	1.589972	2.094581	2.605949	0.8501989
Finland	5.6593573	4.975873	4.831884	3.481533	3.034762	2.070023	1.8182061
France	7.4940048	4.578134	5.579828	3.908958	2.535731	3.710663	1.8610558
Germany	NA	7.739168	4.219219	2.756779	2.315392	2.079083	0.4975409
Greece	NA	NA	7.954927	4.674873	0.710200	2.355700	3.5272222
Ireland	3.2026001	1.739933	4.215289	4.736466	2.870000	7.110000	3.1444444
Italy	NA	6.060585	5.815893	3.128034	2.407300	1.592300	0.2064444
Japan	NA	7.906044	9.139496	4.601107	4.643919	1.193078	0.5378570
Netherlands	NA	3.954550	5.085018	2.931332	2.254174	3.067691	1.2723563
New Zealand	7.0369371	3.484836	3.581376	2.239731	1.723000	2.877800	2.4655556
Norway	7.6505874	3.836354	4.197120	4.710583	2.535731	3.710663	1.8610558
Portugal	2.8372935	4.762352	6.382186	4.819081	2.535731	3.710663	1.8610558
Spain	1.6924847	5.737635	NA	NA	2.981895	2.907287	2.3332958

Country	1946-1950	1951-1960	1961-1970	1971-1980	1981-1990	1991-2000	2000-2010
Sweden	6.1217601	3.620328	5.274890	1.967190	2.203565	2.026641	1.6255954
UK	1.1371502	2.670354	2.832633	1.984710	2.733149	2.547979	2.3448646
US	0.1576796	3.547241	4.215048	3.209143	3.266144	3.411775	1.6148628

3. Replication of figures 1, 2 and 4 of Herndon et al.

Figure 1 Herndon

Figure 2 Herndon

Figure 4 Herndon

Reorganization in a meaningful way

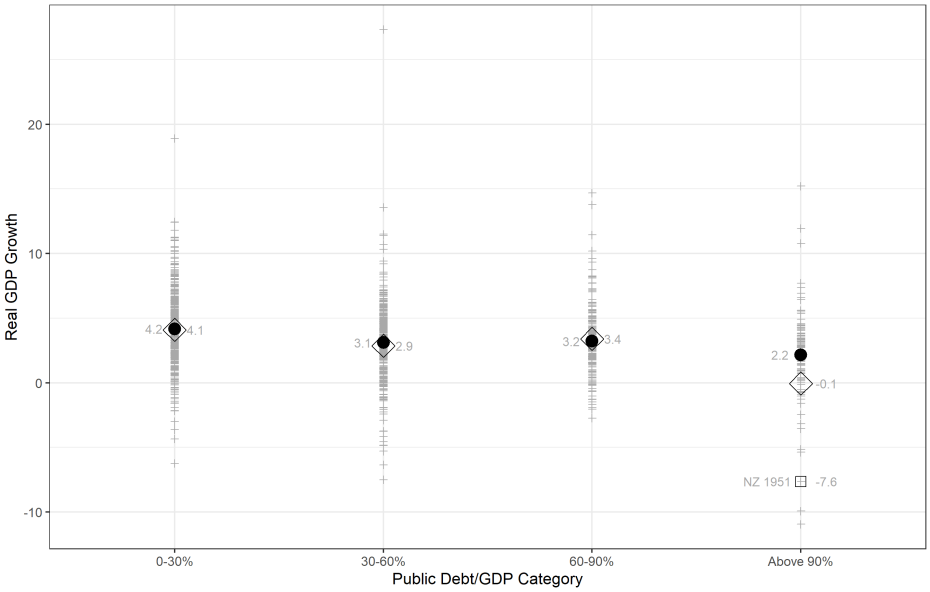

Figure 2: Figure 1 Herndon et al.

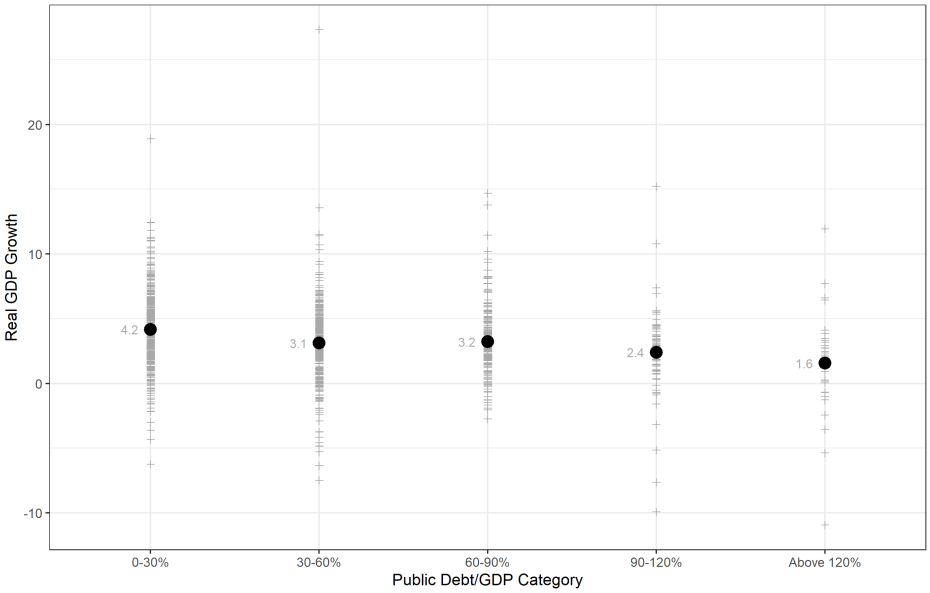

Figure 3: Figure 2 Herndon et al.

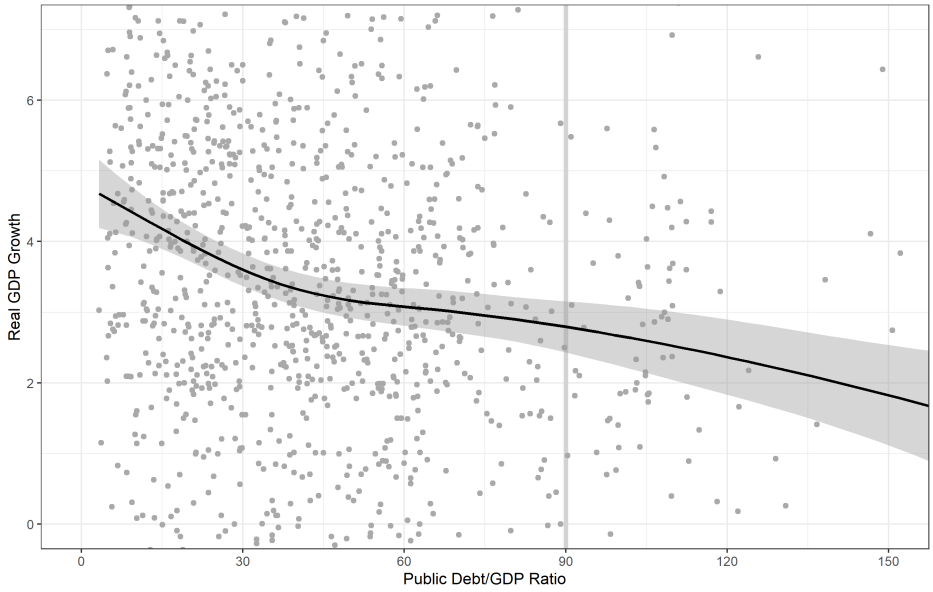

Figure 4: Figure 4 Herndon et al.

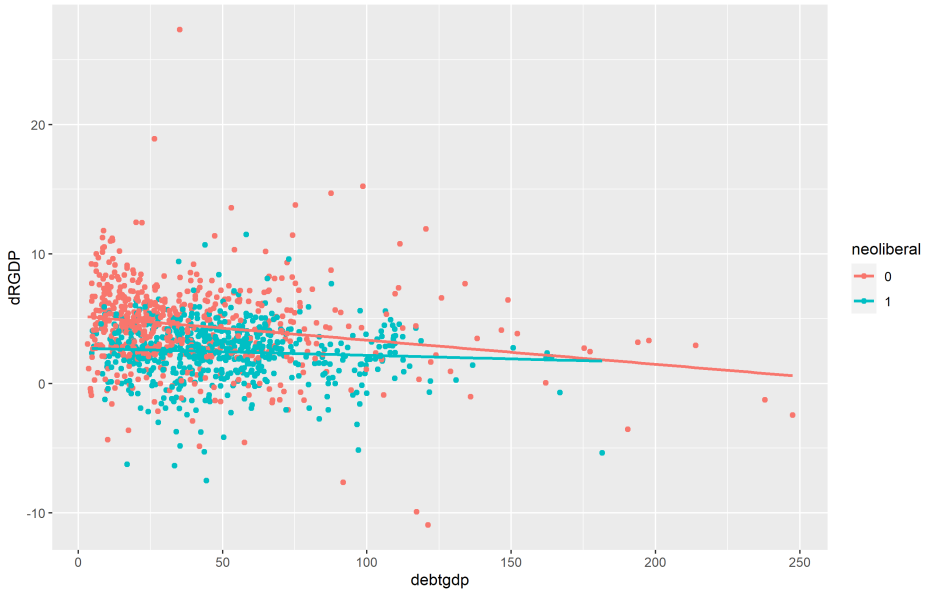

Figure 5: Before and After 1979

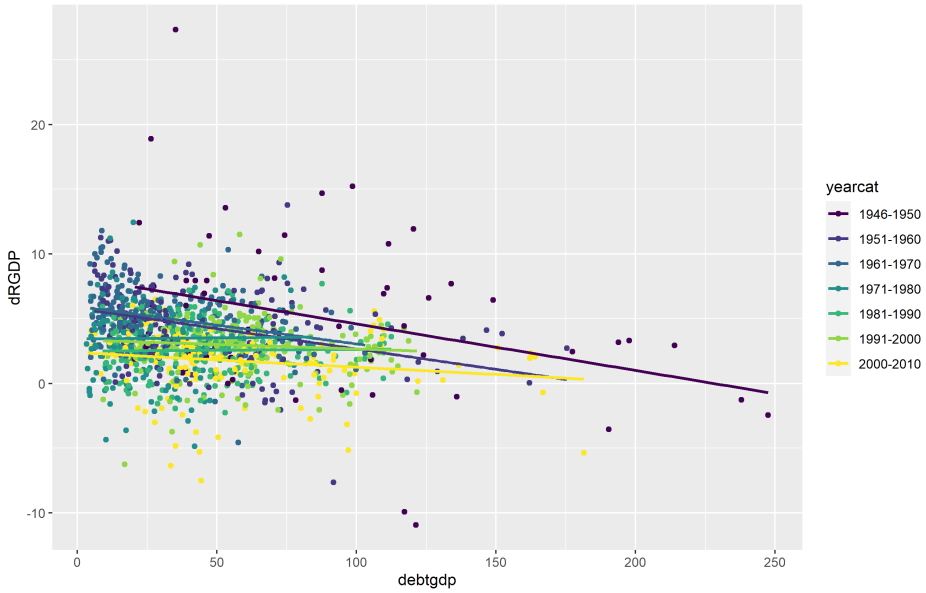

Figure 6: Before and After 1979