

# Econometrics 2 2017

## Problem set 1

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### 1 Problem 1

#### 1.1 (a)

Let  $\epsilon = y - \alpha - x' \beta$ , where  $\alpha = E[y] - E[x']\beta$  and  $\beta = \Sigma^{-1}\delta$ , then I show  $E[\epsilon] = 0$  and  $E[\epsilon x] = 0$ .

$$E[\epsilon] = E[y - E[y] + E[x']\beta - x'\beta] = E[(y - E[y]) - (x' - E[x'])\beta] = (E[y] - E[y]) - (E[x'] - E[x'])\beta = 0$$

$$E[\epsilon x] = E[x\epsilon] = E[x(y - E[y] + E[x']\beta - x'\beta)] = E[x(y - E[y]) - x(x' - E[x'])\beta]$$

$$= E[(x - E[x])(y - E[y]) + E[x](y - E[y]) - (x - E[x])(x' - E[x'])\beta - E[x](x' - E[x'])\beta]$$

$$= \delta - E[(x - E[x])(x' - E[x'])]\Sigma^{-1}\delta = \delta - \delta = 0$$

So now I get the result.

1.2 (b)

1.3 (c)

1.4 (d)

1.5 (e)

## 2 Problem 2

2.1 (a)

2.2 (b)

2.3 (c)

2.4 (d)

## 3 Problem 3

3.1 (a)

3.2 (b)

3.3 (c)

3.4 (d)

3.5 (e)

## 4 Problem 4

4.1 (a)

4.2 (b)

4.3 (c)

4.4 (d)

## 5 Problem 5

5.1 (a)

5.2 (b)