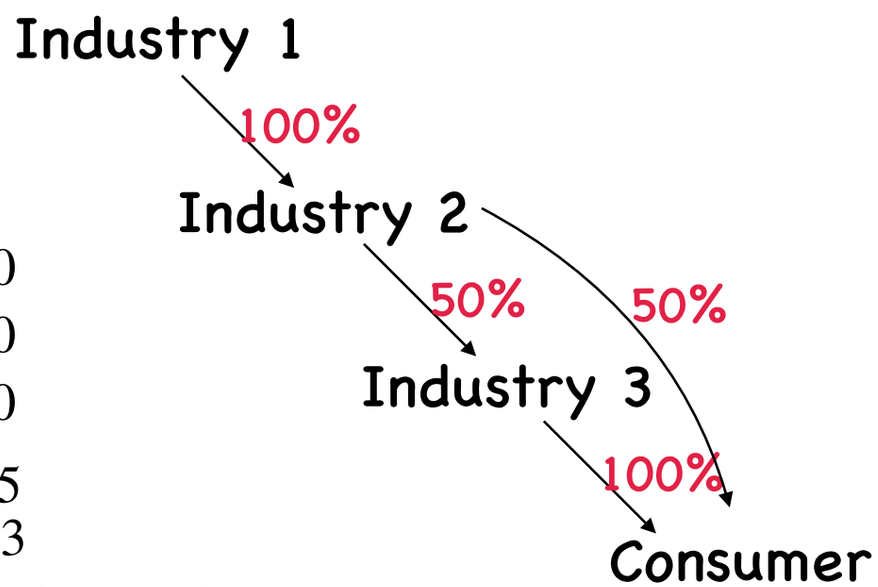
Upstreamness: an elementary example

– Antras, Chor, Fally and Hillberry (2012)



$Y_1 = 100$
$Y_2 = 200$
$Y_3 = 300$

$d_{12} = 0.5$
$d_{23} = 1/3$

- the rest of the coefs are zeros...

$$Y_1 = F_1 + d_{11}Y_1 + d_{12}Y_2 + d_{13}Y_3$$
$$Y_2 = F_2 + d_{21}Y_1 + d_{22}Y_2 + d_{23}Y_3$$
$$Y_3 = F_3 + d_{31}Y_1 + d_{32}Y_2 + d_{33}Y_3$$

d_{12} - 1块钱industry 2的产出，需要industry 1几块钱的产出？

- 这里，d12 = 0.5

$$Y_1 = 100 = 0 + 0 \times 100 + 0.5 \times 200 + 0 \times 300$$
$$Y_2 = 200 = 100 + 0 \times 100 + 0 \times 200 + 1/3 \times 300$$
$$Y_3 = 300 = 300 + 0 \times 100 + 0 \times 200 + 0 \times 300$$

<u>According to Equation (2) in the paper</u>

$$Yi = Fi + di1F1 + di2F2 + di3F3$$
$$(j=1, k=1,2,3) + di1d11F1 + di2d21F1 + di3d31F1$$
$$(j=2, k=1,2,3) + di1d12F2 + di2d22F2 + di3d32F2$$
$$(j=3, k=1,2,3) + di1d13F3 + di2d23F3 + di3d33F3$$

$$Y1 = F1 + d11F1 + d12F2 + d13F3 + d11d11F1 + d12d21F1 + d13d31F1 + d11d12F2 + d12d22F2 + d13d32F2 + d11d13F3 + d12d23F3 + d13d33F3$$

$$Y1 = 0 + 0*0 + 0.5*100 + 0*300 + 0*0*0 + 0.5*0*0 + 0*0*0 + 0*0*100 + 0.5*0*100 + 0*0*100 + 0*0*300 + 0.5*1/3*300 + 0*0*300 = 100$$

$$U1i = 1*Fi/Yi + 2*(di1F1 + di2F2 + di3F3)/Yi + 3*(di1d11F1 + di2d21F1 + di3d31F1 + di1d12F2 + di2d22F2 + di3d32F2 + di1d13F3 + di2d23F3 + di3d33F3)/Yi$$

$$U11 = 1*F1/Y1 + 2*(d11F1 + d12F2 + d13F3)/Y1 + 3*(d11d11F1 + d12d21F1 + d13d31F1 + d11d12F2 + d12d22F2 + d13d32F2 + d11d13F3 + d12d23F3 + d13d33F3)/Y1$$

$$U11 = 1*0/100 + 2*(0.5*100)/100 + 3*(0 + 0 + 50)/100 = 2.5$$

So the "upstreamness" of industry 1 in this example is <u>2.5</u>.
Similarly, the "upstreamness" of industry 2 (i.e., U12) = <u>1.5</u>, and U13 = <u>1</u>.