**SPF Data on Real GDP**

RGDP1(t) = EY(t-1|t) 🡪 Given information set at t predict RGDP at t-1. (backcast)

RGDP2(t) = EY(t|t) 🡪 Given information set at t predict RGDP at t. (nowcast)

RGDP3(t) = EY(t+1|t) 🡪 Given information set at t predict RGDP at t+1 (forecast)

RGDP4(t) = EY(t+2|t) 🡪 Given information set at t predict RGDP at t+2 (forecast)

RGDP5(t) = EY(t+3|t) 🡪 Given information set at t predict RGDP at t+3 (forecast)

RGDP6(t) = EY(t+4|t) 🡪 Given information set at t predict RGDP at t+4 (forecast)

**Build the Forecasted Growth rates**

Delta\_RGDP\_t(t) = EY(t+3|t)/EY(t-1|t) – 1 🡪 implied annual GDP growth in 3 periods given info set at t

Delta\_RGDP\_t1(t) = EY(t+4|t)/EY(t|t) – 1 🡪 implied annual GDP growth in 4 periods given info set at t

**Forecast Revision**

Z1(t) = Delta\_RGDP\_t(t) - Delta\_RGDP\_t(t-1) = EY(t+3|t)/EY(t-1|t) - EY(t+3|t-1)/EY(t-1|t-1) 🡪 Forecast revision of the Real GDP growth in one year passing from information set at time t-1 to information set at time t. Z(t) captures an informational shock. Something is updated by the SPFs and they thus revise what the forecasted in the past.

**Real GDP Growth Rate**

YRG(t) = Y(t)/Y(t-4) – 1

**Forecast Error**

FERGDP(t) = YRG(t) - Delta\_RGDP\_t(t-3) = Y(t)/Y(t-4) - EY(t|t-3)/EY(t-4|t-3) 🡪 Forecast error of the annual growth rate at t given the information set at t-3.

**Local Projection**

FERGDP(t) = B0\*Z1(t);

Y(t)/Y(t-4) - EY(t|t-3)/EY(t-4|t-3) = B0\* [EY(t+3|t)/EY(t-1|t) - EY(t+3|t-1)/EY(t-1|t-1)] 🡪 If B0 > 0 this might imply that the causality is going from Y to X because a positive forecast error today is systematically related with a positive forecast revision made today for the future.

FERGDP(t+3) = B3\*Z1(t);

Y(t+3)/Y(t-1) - EY(t+3|t)/EY(t-1|t) = B3\* [EY(t+3|t)/EY(t-1|t) - EY(t+3|t-1)/EY(t-1|t-1)] 🡪 If B3 > 0 this coefficient is the underreaction of Coibon and Gorodnichenko. A positive forecast revision today on a specific horizon is systematically related with a positive forecast error at the same horizon. This means that SPFs systematically underestimate GDP growth rate when they receive a news that GDP growth rate should be higher in future.

FERGDP(t+8) = B8\*Z1(t);

Y(t+8)/Y(t+4) - EY(t+8|t+5)/EY(t+4|t+5) = B8\* [EY(t+3|t)/EY(t-1|t) - EY(t+3|t-1)/EY(t-1|t-1)] 🡪 If B8 < 0, it means that SPFs at t+5 are optimistic regarding financial conditions and predict a higher growth rate than what actually is going to be.

**Comment**

Dynamics responses of FE implies that

1. Initially SPF underreact to the shock.
2. They do not correctly predict the subsequent recession.