Discussion of "The Great Diversification and its Undoing" by Vasco Carvalho and Xavier Gabaix

Alessio Moro

University of Cagliari

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Summary

This paper introduces a new measure of aggregate volatility that depends directly on sectoral TFP volatility and Domar weights.

"Fundamental volatility" tracks well US GDP volatility over time.

It also tracks reasonably well GDP volatility in Germany, France, Japan and UK.

Robust to several checks.

Model free: the I-O matrix is not necessarily stable over time.

Value added

It relates "fundamental volatility" instead of "equilibrium volatility" to aggregate volatility.

It can account for the most important volatility swings of the last 50 years (oil shocks, great moderation, financial crisis).

It suggests the "Great Moderation" comes from structural change.

Potentially important implications already for the one sector growth model.

Why are Domar weights moving?

Perform a "fundamental volatility" decomposition.

$$\sigma_F(t) = \sqrt{\sum_{i=1}^{N} \left(\frac{S_{it}}{Y_t}\right)^2 \sigma_i^2} = \sqrt{\sum_{i=1}^{N} \left(\frac{S_{it}}{Y_{it}}\right)^2 \left(\frac{Y_{it}}{Y_t}\right)^2 \sigma_i^2}$$

where S_{it} is nominal gross output in sector i, Y_{it} is nominal value added (GDP) in sector i, Y_t is nominal GDP in the economy.

$\frac{S_{it}}{Y_{it}}$ depends on the share of intermediate goods in gross output in sector i

$\frac{Y_{it}}{Y_t}$ is the value added share of sector i in total value added (nominal GDP).

A decomposition experiment

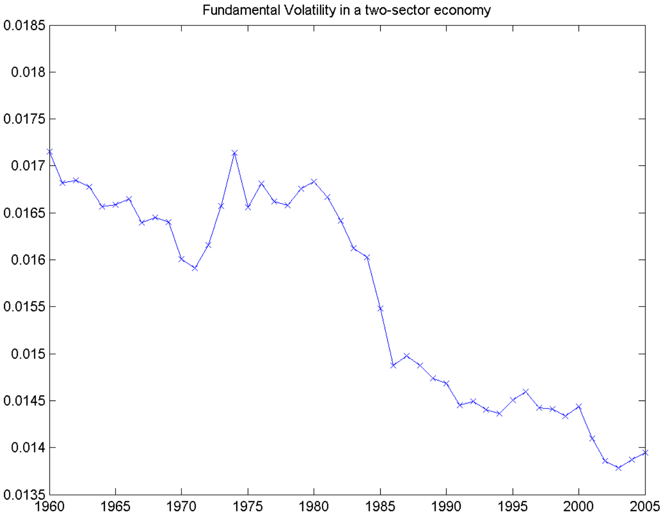
Fix $\frac{S_{it}}{Y_{it}}$ to their period one value and compute

$$Counterfactual_1(t) = \sqrt{\sum_{i=1}^{N} \left(\frac{S_{i1}}{Y_{i1}}\right)^2 \left(\frac{Y_{it}}{Y_t}\right)^2 \sigma_i^2}$$

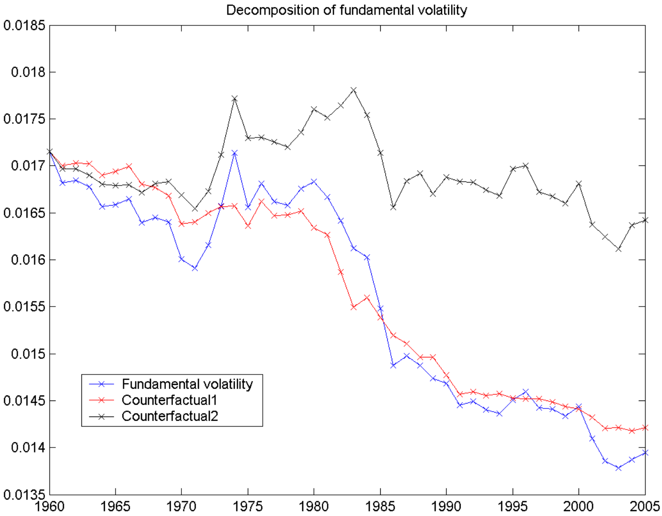
Then fix $\frac{Y_{it}}{Y_t}$ to their period one value and compute

$$Counterfactual_2(t) = \sqrt{\sum_{i=1}^{N} \left(\frac{S_{it}}{Y_{it}}\right)^2 \left(\frac{Y_{i1}}{Y_1}\right)^2 \sigma_i^2}$$

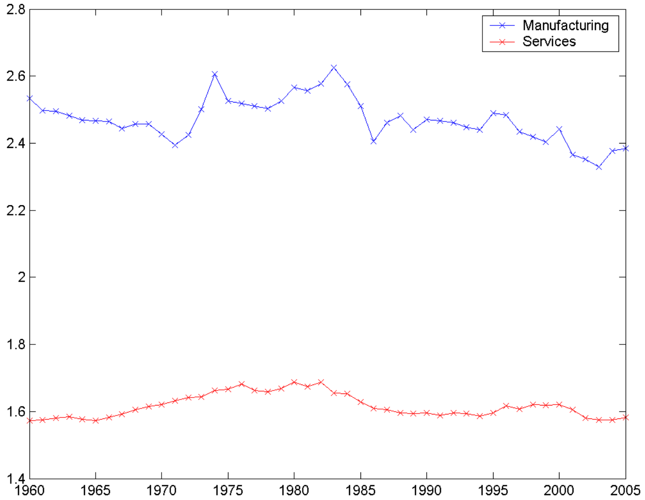
$\sigma_F(t)$ in the US: 2 sectors, $\sigma_m = 1.26\%$, $\sigma_s = 0.96\%$



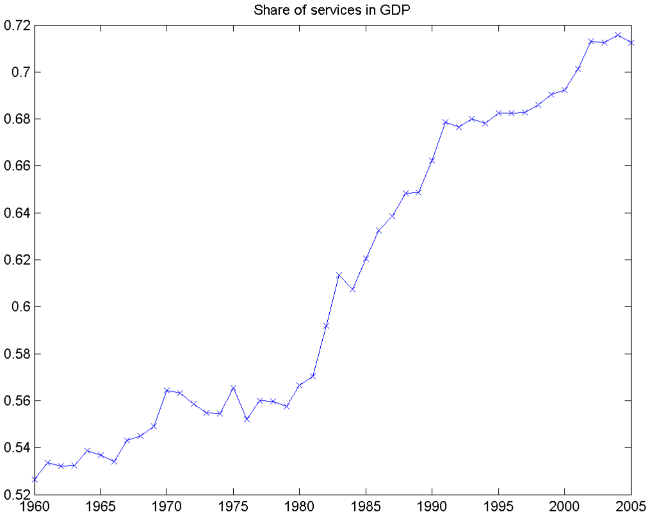
Decomposition of Fundamental volatility



Weights $\frac{S_{it}}{Y_{it}}$ in manufacturing and services



Share of services in GDP



Can we use value added measures then?

If the share of intermediates in each sector is constant then

$$\sigma_F(t) = \sqrt{\sum_{i=1}^{N} \left(\frac{Y_{it}}{Y_t}\right)^2 \left(\frac{S_i}{Y_i}\sigma_i\right)^2}$$

where $\frac{S_i}{Y_i}\sigma_i$ is the volatility of value added TFP.

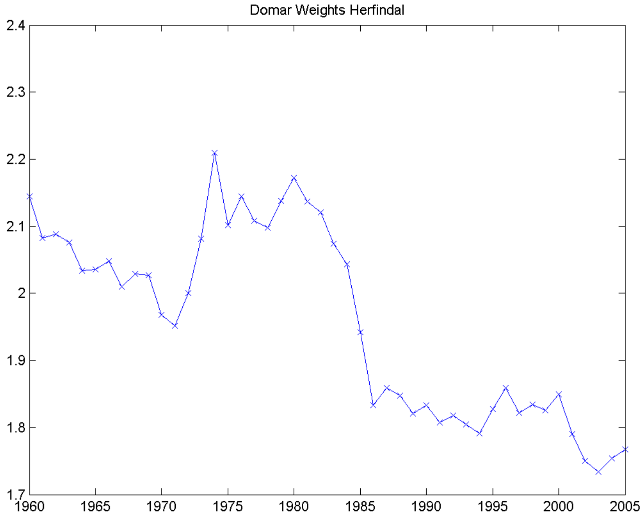
Diversification

Some care should be used with the diversification argument.

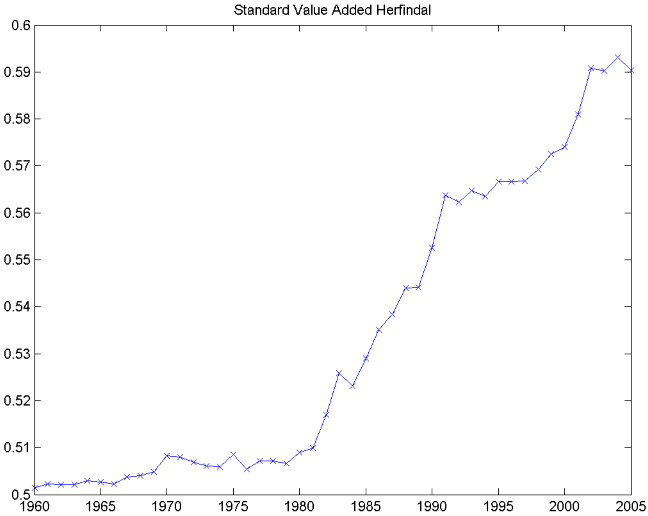
We can have a decline in the "fundamental volatility" measure even with NO diversification.

$$Herfindal(t) = \sum_{i=1}^{N} \left(\frac{S_{it}}{Y_t} \right)^2 = \sum_{i=1}^{N} \left(\frac{S_{it}}{Y_{it}} \right)^2 \left(\frac{Y_{it}}{Y_t} \right)^2$$

Herfindal with Domar weights



"Standard" Herfindal with Value Added Shares



The model

No structural change.

No need to track changes in the I-O structure to compute "fundamental volatility".

It is possible that changes in the I-O matrix affect the transmission mechanism of sectoral shocks to endogenous variables.

In this case, changes in GDP volatility are not due only to changes in the volatility of aggregate TFP.

The model

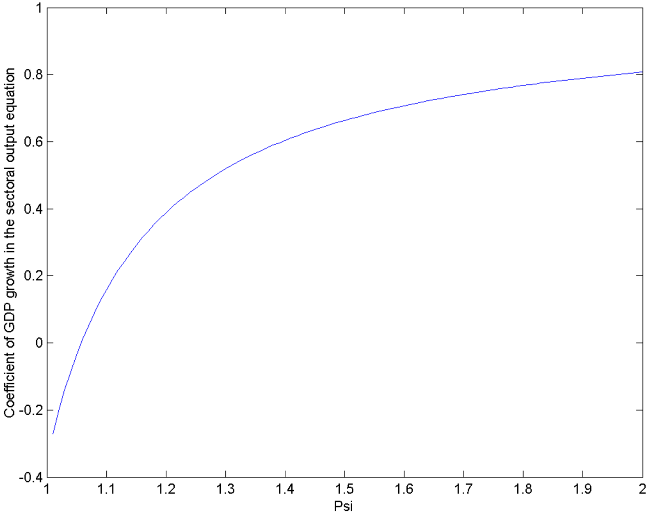
The coefficient of GDP growth in the sectoral output equation is positive for a sufficiently high ψ.

$$\widehat{Q}_i = \psi\beta\widehat{A}_i + (1 - \psi\Phi)\widehat{Y}$$

where ψ determines the elasticity of substitution in gross output

$$Q = \left(\sum_i Q_i^{1/\psi}\right)^{\psi}$$

GDP coefficient $(1 - \psi\Phi)$



Do we need intersectoral linkages to generate comovement of sectors' output?

Simpler models? Dixit-Stiglitz?

$$c_i = \left(\frac{p_i}{P}\right)^{-\frac{\psi}{1-\psi}} C$$