2-1985

LTV Trans + Price-Value Deviations Mel

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LTV: TRANS
+ Price-Value
Deviations
"HISTORICAL"
(F.A. - old)

Mel I

January 28, 1985

Dear Anu,

I hope your time away from the city was well spent, and that the shock of returning hasn't been too great. Welcome to Bernhard Goetz' country.

I wanted to tell you what I've been doing on deviations of price from direct price. The results I have seem pretty modest for our purposes. They can perhaps be fleshed out a bit with more work but I'm not sure it's worth it for me to do so. I can't guarantee much improvement on what I have already, and I'd like some assurance that it would be publishable. If it's not, I need to know that, so I can attempt another project (my tenure decision is less than two years away and I don't have much time to take chances.)

So here goes:

1) Marx's incomplete solution* and (Sraffian) prices of production certainly can deviate in opposite directions from direct prices. Perhaps the best example is the US economy, 1949-1972, as reported in Ochoa's dissertation. Ochoa compares the three price systems, but nowhere looks at the price-"value" deviations. However, if I understand his calculations right, one further step using his tables 6.9, 7.1 and 7.9 yields two new vectors of price per unit of direct price. A quick perusal of the resulting relative deviations shows that most, but not all, are similar in direction and magnitude. The most striking observation is that, consistently ~~f~~ over the nine years studied, six or seven of the 71 production prices deviate in opposite directions from "Marx's solution." There is a strong tendency for these to be the same few industries from year to year. They are concentrated among the industries with the smallest

need numerical question also

* By this I will always mean the solution using "vertically integrated value compositions of capital," as per Ochoa and you.

which are small

price-"value" deviations, but not overwhelmingly so. (Some have deviations of up to median magnitude).

why even?

2) In partial answer to the question of how badly one set of deviations can differ from the other, I have the following. If n is any even integer representing the number of industries in the economy, I can find an input-output matrix such that:

a) Half the industries have prices above the direct price, and half below, whether we calculate by Marx's solution or the "complete transformation"; — At what r, r/R?

counter example

b) The deviations are all of significant size, within the empirically observed range;

c) The industry with the single highest (lowest) price according to "Marx's solution" retains this property after the "complete transformation;" but

d) The other n-2 industries all "change places;" that is, the half that were priced above direct price according to "Marx's solution" are below according to Sraffa's, and vice-versa.

nice

How bad a counterexample? Pretty bad.

*

3) However, this counterexample (in addition to ~~other~~ unlikely properties) relies on a very high value of R, the maximum rate of profit. What happens if R is small is actually very nice. In fact, by multiplying by a scalar factor one can vary a given "economy" so as to range through all possible positive values of R. If this is done I think I can actually prove that if R is allowed to approach zero the limiting values of Marx's and Sraffa's solutions approach equality. This is a positive result — both in the sense that it is absolute and that it is "good". (One could even interpret it in a historical sense to say that as organic compositions increase — and the rate of profit falls — Marx's solution becomes more accurate).

R and also r/R is relevant

yes, but this means r → 0 also

4) Conceivably, one could do a study where "bad" examples like the one in point 2) are constructed and R is allowed to range as in 3). The relative rate of profit, x, should also probably be allowed to vary. One could then see how large R must become before large differences in the two sets of deviations appear — and how small it must become before significant differences disappear. Unfortunately, I can't think of a way to ensure that the constructed examples would in any way represent a "random sample" of all "bad" possibilities.

5) The (tentative) conclusion seems to be that the deviations are not overwhelmingly of the same magnitude and direction. Marx's procedure may receive renewed vindication from point 3), since it shows that in some sense these prices are a better approximation to prices of production than are direct prices; but if our goal is to interpret these deviations as value-based quantities, I think we must simply point out that your equations — in which they are computed using value quantities — and not Sraffa's, reveal their economic as well as their numerical source!

I want to stress again that this is all I can guarantee. I don't claim to have tried all sorts of fancy numerical or statistical techniques, nor am I expert at determining whether I may have missed something along these lines. But I'm not sure whether anything more enlightening would emerge anyway.

Do you think, assuming there are no flaws in my reasoning, that there's something worth publishing here? It means a lot to me to know the answer to this rather soon because of the pressure I'm under, and, believe me, I won't be insulted if the answer is no. I realize that you're returning to old responsibilities and don't have loads of time, so maybe you could give me an idea as to when we might talk about it. If these results don't seem worth publishing I might want to discuss another project — if you're interested — and I have an idea myself for something that just might be worth doing.

I'll call you next week to talk.

Regards,

Mel Bienenfeld

4n

Mel

$$p = w\lambda + (1+r)\,pA$$

$$\hat{\pi} = p\langle\lambda_g\rangle^{-1} \qquad A_\lambda = \langle\lambda_g\rangle A \langle\lambda_g\rangle^{-1}$$

$$\hat{\pi} = w\hat{1} + (1+r)\,\pi A_\lambda = w$$

$$\hat{\pi} = w\hat{1} + \frac{(1+r)}{(1+R)}\hat{\pi}\,[(1+R)A_\lambda]$$

$$\hat{\pi} = w\hat{1} + x\,\hat{\pi}\hat{A} \quad \text{where } \hat{A} = (1+R)A_\lambda$$

[a Matrix with $\psi(\hat{A}) = 1$]

$$w = 1 - r/R = \left[1 - \frac{(1+r)}{(1+R)}\right]\frac{(1+R)}{R} = (1-x)\frac{(1+R)}{R}$$

$$\therefore \boxed{\pi = w1[I - x\hat{A}]^{-1}}, \quad x = \frac{(1+r)}{(1+R)}$$

Sraffian PoP

$$\boxed{\pi = 1\,[wI + wx\hat{A} + wx^2\hat{A}^2 + \cdots]}$$

$$w = (1-x)\frac{1+R}{R} \rightarrow \pi = \hat{1}\left(\frac{1+R}{R}\right)[(1-x)I + (1-x)x\hat{A} + (1-x)(x^2)\hat{A}^2 + \cdots]$$

Marxian $\quad p^+ = w\lambda + (1+r)\lambda A$

$$\pi^+ = w1 + \frac{(1+r)}{(1+R)}1\hat{A} = w1[I + x\hat{A}]$$

$$\boxed{\pi^+ = w1[I + x\hat{A}]} = 1[w + wx\hat{A}]$$

Marxian PoP

$$\therefore \pi = 1[w + wx\hat{A}] + 1[wx^2\hat{A}^2 + wx^3\hat{A}^3 + \cdots]$$

$$\boxed{\hat{\pi} = \hat{\pi}^+ + 1x^2\hat{A}^2[wI + wx\hat{A} + wx^2\hat{A}^2 + \cdots]}$$

where $\pi_g \equiv \dfrac{p_g^*}{\lambda_g}$ and $\pi_g^+ = \dfrac{p_g^+}{\lambda_g}$ and $w = (1-x)\dfrac{(1+R)}{R}$, $x = \left(\dfrac{1+r}{1+R}\right)$

1. Let $\hat{A} \equiv (1+R)\, A_\lambda = \begin{bmatrix} 0 & 0 & 5/6 & 0 \\ 2 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1/2 \\ 0 & 6/5 & 0 & 0 \end{bmatrix}$

$$\therefore A_\lambda = \begin{bmatrix} 0 & 0 & & \\ 2/(1+R) & 0 & \cdots & \\ 0 & 0 & & \\ 0 & (6/5)\left(\frac{1}{1+R}\right) & & \end{bmatrix}$$

$$\text{Col. sums of } A_\lambda \equiv \left[\frac{c_\gamma}{d_\gamma}\right] = \left[\frac{2}{(1+R)}, \frac{6/5}{(1+R)}, \frac{5/6}{(1+R)}, \frac{1/2}{(1+R)}\right]$$

Since $\frac{c_\gamma}{d_\gamma} < 1$ for all γ

$$\Longrightarrow \frac{2}{(1+R)} < 1 \Rightarrow (1+R) > 2$$

$$\boxed{R > 1}$$

2. Left Eigenvector of $\hat{A} = \left[\frac{33}{20}, \frac{33}{40}, \frac{11}{8}, \frac{11}{16}\right] = [1.65, .825, 1.375, .6875]$

6 industries $\hat{A} = \begin{bmatrix} 0 & 0 & 0 & 5/6 & 5/6 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1/4 \\ 0 & 0 & 0 & 0 & 0 & 1/4 \\ 0 & 6/5 & 6/5 & 0 & 0 & 0 \end{bmatrix}$

eigenvector $= \left[\frac{33}{20}, \frac{33}{40}, \frac{33}{40}, \frac{11}{8}, \frac{11}{8}, \frac{11}{16}\right]$

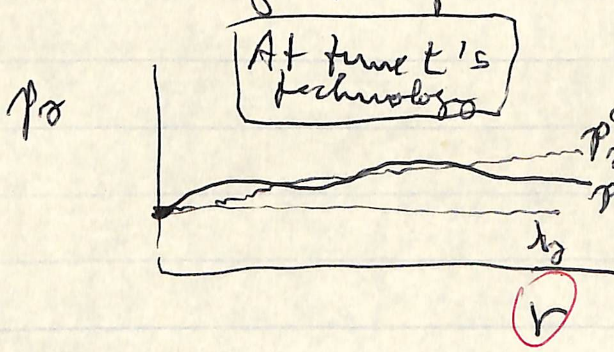
2/15/85

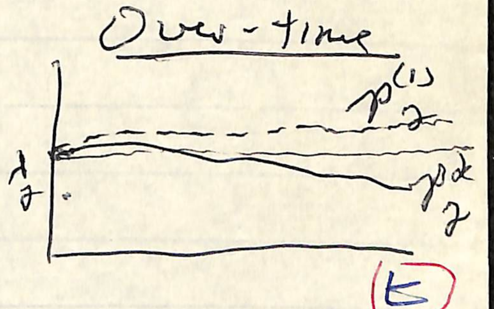
Notes on Mel Bielenfeld's letter of 1/28/85

1. Prices of prod. can deviate in opposite direction from Marx's prices

- Depends on "numeraire" question (Std. commod.)
- Depends further on what?

~~2.~~ - Have to keep in mind lateral & ~~long~~ temporal variation





2. Counter-example

✓ - numeraire? (i.e. what effect does a change in numeraire have
- VIVC ~~s~~ deviations from std?
(vertically integrated Value Con)
- what rate of profit r, or share r/R, is assumed?

3. Publication.
- Science & Society?
- URPE
- QJE? - Comment on earlier one?
(JPE?) - CJE?

Mel 2/15/85

1. Create $A_\lambda = \left[\frac{\lambda_i A_{ij}}{\lambda_j X_j} \right] = \left[\frac{c_{ij}}{\Lambda_j} \right]$

s.t. col. sums < 1

2. Let $\Psi(A_\lambda) \equiv \frac{1}{1+R}$, then

$$\hat{A} \equiv (1+R) A_\lambda \text{ has } \Psi(\hat{A}) = 1$$

$$w^* = 1 - r/R = \text{std. wage}$$

3. $p^* = \left[\frac{p_j}{\lambda_j} \right] = \hat{1} \left[w^* I + \frac{w^* r}{(1+R)} \hat{A} + \frac{w^* r}{(1+R^2)} \hat{A}(1+r) + \ldots + \frac{r w^* (1+r)^{k-1}}{(1+R)^k} \hat{A}^k + \ldots \right]$

Std Price / Value = $p^* = \hat{1} \left[w^* I + \frac{w^* r \hat{A}}{1+R} \left(I + \hat{A} \frac{(1+r)}{(1+R)} + \hat{A}^2 \frac{(1+r)^2}{(1+R)^2} + \ldots \frac{(1+r)^{k-1}}{(1+R)^{k-1}} \hat{A}^{k-1} + \ldots \right) \right]$

Marx's V(C) Price / Value $= m^* = \hat{1} \left[w^* I + w^* r \hat{A} \left(I + \hat{A} \frac{1}{(1+R)} + \hat{A}^3 \frac{1}{(1+R)} + \ldots \right) \right]$

~~What is happening to max. wage intercept~~ = 1

Max wage = 1 since $\lambda_j = 1$ by assumption

⟹ curve is shifting outward

$p = pA + wl + rpA$

$H_\lambda = A_\lambda (I - A_\lambda)^{-1}$; $A_\lambda = \langle \lambda_j \rangle A \langle \lambda_j^{-1} \rangle$

Marx's price value deviation à la VIC → $\mu^* \equiv m^* - \hat{1} = \frac{r}{R} \hat{1} [R H_\lambda - I]$ $\quad {}^{p_j/\lambda_j}$

$\mu^* [I - \frac{r}{R}(R H_\lambda)]^{-1}$

$d^* = p^* - \hat{1} = \mu^* [I - \frac{r}{R}(RH_\lambda)]^{-1}$ $\quad {}_{p_j^*/p_0}$

$\cancel{x^4 - 1 = 0}$

or use $\begin{bmatrix} 0 & & 0 \\ 2 & \cdots & 1/3 \\ & & 1/3 \\ & & 1/3 \end{bmatrix}$

What are VIC's of this example?

If we take equal VIC'S & then perturb slightly, should get anomalies?