Pipeline pressures and Sectoral Inflation dynamics

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Discussion Huw Dixon
Basic idea:

- Sectors linked by input-output relationships.
- What happens in one sector can feed through over time to other sectors.
- Pipeline pressures: some sectors identified as important in US as leading sectors (mining, oil and gas, services)
- Fits in with common sense (WSJ and FT, leading indicators....)
- Great paper.

Orthodox approach: Boivin, Giannoni, Mihov AER 2009.

- Decomposes shocks into aggregate and sectoral.
- Aggregate shocks drive persistence and volatility at aggregate level,
- Sectoral shocks largely “white noise”, persistence at sectoral level comes from aggregate shock.

This paper: adds “inter-sectoral” effect, pipeline effects of sector j on other sectors j’.
Observations.

1. The input out relations in STV are instantaneous. There is no “time to build”
   \[ \Omega \text{ and } \psi \text{ give the direct inputs } y \text{ needed to produce outputs } x \]

   *Leontief inverse* gives you total output needed to produce (net) output
   \[ [I - \Omega]^{-1} = I + \Omega + \Omega^2 + \ldots \Omega^i + \ldots \]

2. In STV, all sectors are inter-related and all of “Leontief inverse” happens each period (Every firm buys from every other firm in intermediate sector).

3. With perfectly flexible prices, **No Pipeline Pressures** (?).
4. Pipeline pressures:

“In the presence of production linkages, the sectoral shock in sector \( j \) spills over to the MC of sector \( j \) through \( \Omega \). If sector \( j' \) is a sticky price sector, it will only slowly adjust its prices to these pipeline pressures. Subsequently, all sectors that depend on \( j' \) will face sluggish changes in their input costs.” (STV p.27).

**Pipeline Pressures = Input-Output + Sticky Prices.**

5. Pipeline pressures would not exist in a model with no intermediate production, or where all intermediates are produced only with capital and labour, or with flexible prices.

Modelling choices.

1. There are no sticky prices. All prices change every period. Some are reset, the rest indexed. Calvo with indexation. Goes against the facts: 70%+ of US CPI prices remain unchanged each month.

2. Since sticky prices are so important, why not model them using price microdata?
   a. Whole distribution from CPI or PPI microdata (Generalised Calvo or Generalised Taylor)? Dixon, Franklin and Millard for UK.
   b. Use frequencies (average monthly proportion of prices changing by sector). “Multiple Calvo”.
   c. Bayesian estimate of PPI indexation close to zero, CPI 0.2. Not much to lose by using price microdata and assuming no indexation?
   d. Wages the exception with indexation 0.4 (Posterior Table 9).
Chart 3: Sectoral hazard rate distributions

For UK using CPI price quote data for 1996-2015
US 1970-2007: lots of variation in inflation, model linearized around 0 inflation. Since average inflation over the whole period is 5%, maybe need to include trend inflation (Ascari and co-authors).

3. Input output dynamics. Real time lags in input-output relationship. For example Huang and Liu 2000. This would lead to inflation dynamics even with flexible prices.

4. It would be good to have a simple version of the model. Current approach is Smets and Wouters plus plus (SW++). Would be good to have a mini model to illustrate (teaching purposes).
Simple model? Illustrative with two intermediate sectors “pork pie” effect.

Final good: \[ Y = (y_1)^\alpha (y_2)^{1-\alpha} - \Phi_c \]

Intermediate: \[ y_i = N_i^\beta y_j^{1-\beta} - \Phi_I \quad (I-O \text{ “pipeline” } i \neq j). \]

Demand: \[ M = PY \]

Cost min: \[ P = \mu_c p_1^\alpha p_2^{1-\alpha} \]

Intermediate: \[ p_i = \mu_l w^\beta p_j^{1-\beta} \]

Labour supply: \[ N_1 + N_2 = N \left( \frac{W}{P}, C \right) \]

Market clearing: \[ Y = C \]

Can explicitly solve and analyse, tell story - captures spirit of SW++?
Conclusion.

- Surely improves the current methodology that drives sectoral shocks to lack persistence.
- Vast modelling enterprise, estimation and analysis, with sensible policy results.
- Intersectoral “pipeline effects” plays an important role.
- Cascade effect: inflation in one sector propagates across sectors via input output relationship.
- Valuable contribution, help makes macro more “real”.
### TABLEAU ÉCONOMIQUE

<table>
<thead>
<tr>
<th>Avances annuelles</th>
<th>Revenus</th>
<th>Avances annuelles</th>
</tr>
</thead>
<tbody>
<tr>
<td>600 produits</td>
<td>600</td>
<td>300</td>
</tr>
<tr>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Définitions des revenus**
  - **Définitions des revenus**: Produits, salaires, loyers, etc.
  - **Définitions des dépenses**: Produits, salaires, loyers, etc.

- **Avances annuelles**: 600 produits, 300

- **Revenus**: 600

- **Avances annuelles**: 300

**Note**: Le tableau établi dit que le nombre de produits est de 600, les dépenses de 300, et les revenus de 600. Les dépenses annuelles sont de 300, et les revenus de 600, ce qui laisse la balance économique équilibrée.

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### Résumé de l'article

L'article traite de la compréhension des dynamiques de l'inflation. Il mentionne que l'Inflation est influencée par divers facteurs tels que la demande, l'offre, et l'influence de la politique monétaire. Les particuliers sont encouragés à investir dans des actifs fixe pour minimiser l'effet de l'inflation sur leurs actifs. De plus, l'article souligne l'importance de diversifier les placements pour réduire le risque. Les gouvernements ont un rôle crucial dans la gestion de l'inflation en maintenant la stabilité de la monnaie et en assurant une croissance économique soutenable. Les entreprises jouent également un rôle important en adoptant des stratégies de planification financière robustes pour anticiper les fluctuations de l'inflation.