Online Appendix

"Sentiments in SVARs"

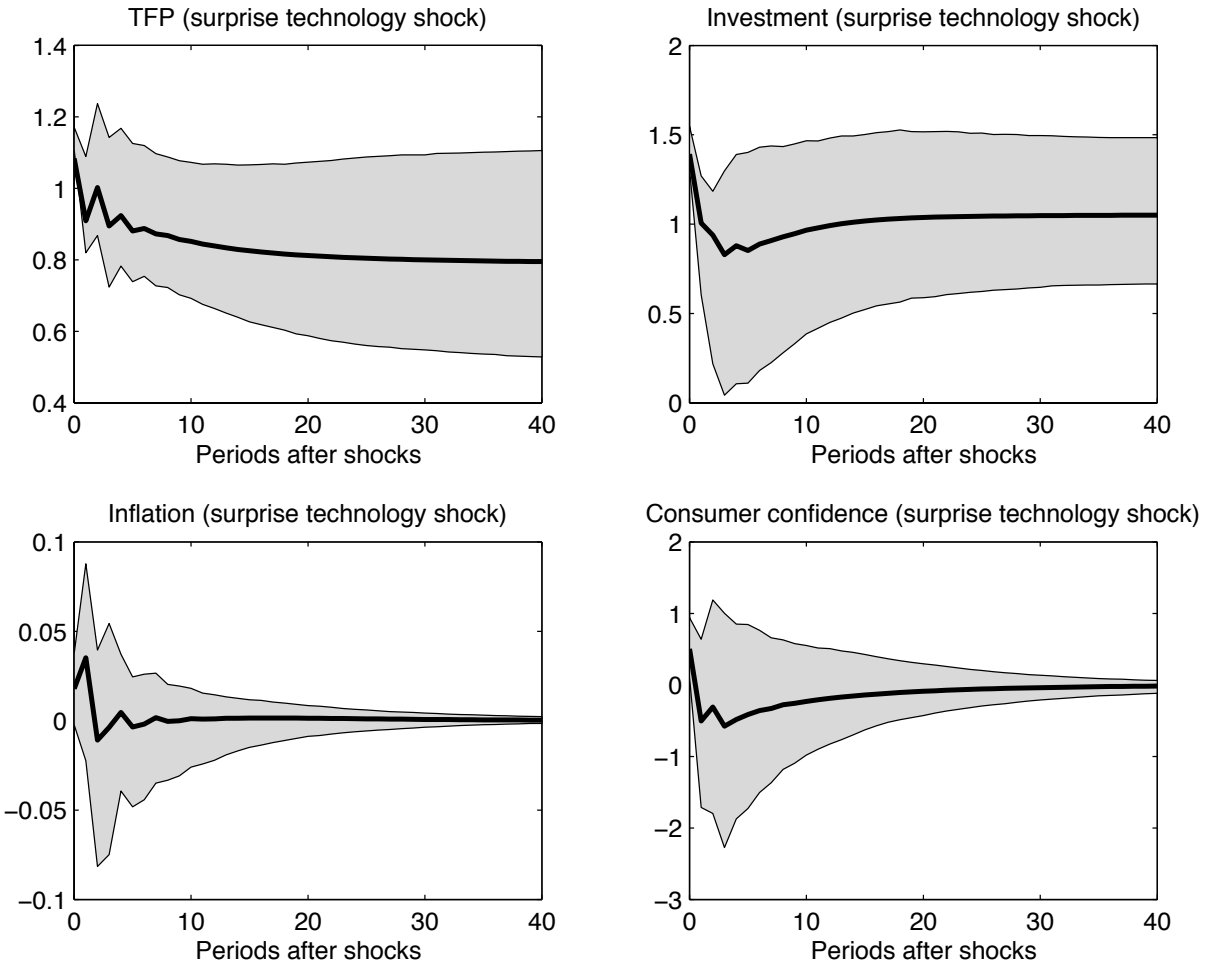
Patrick Fève and Alain Guay

The body of the paper does not include IRFs, histories and/or variance decomposition in the robustness analysis. In this appendix, we report:

1. Dynamic responses and history when private investment is used instead of GDP.
2. Dynamic responses and history when private consumption is used instead of GDP.
3. Dynamic responses when hours worked are used instead of inflation.
4. Dynamic responses and history when the Barsky and Sims (2011) identification strategy is implemented.
5. Variance Decomposition when the zero restriction of demand shock on TFP is relaxed.
6. Dynamic responses, Variance Decomposition and History with GDP on a shorter sample (1960–2006).

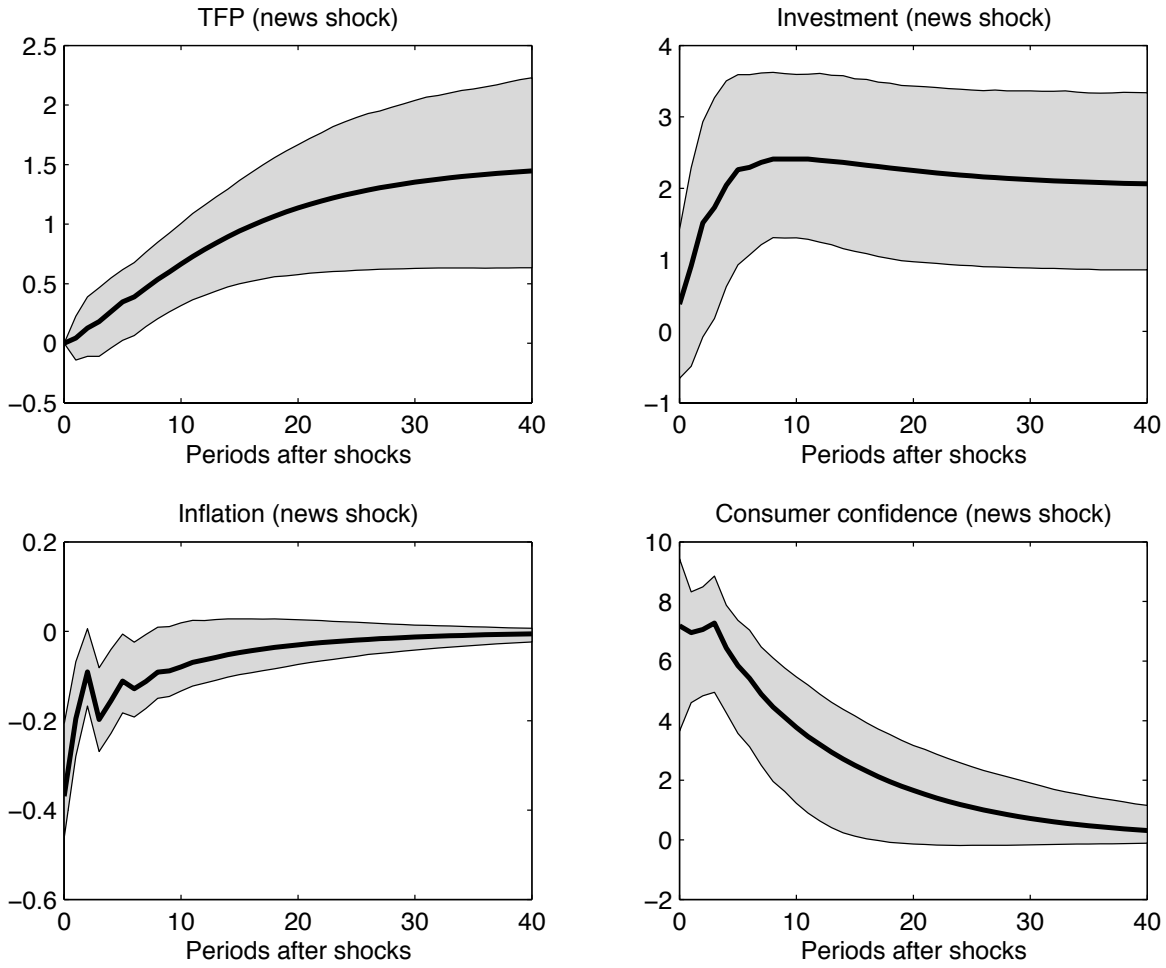
1 Dynamic Responses and History: Investment

Figure 1: IRFs to a surprise TFP shock (SVECM & Investment)



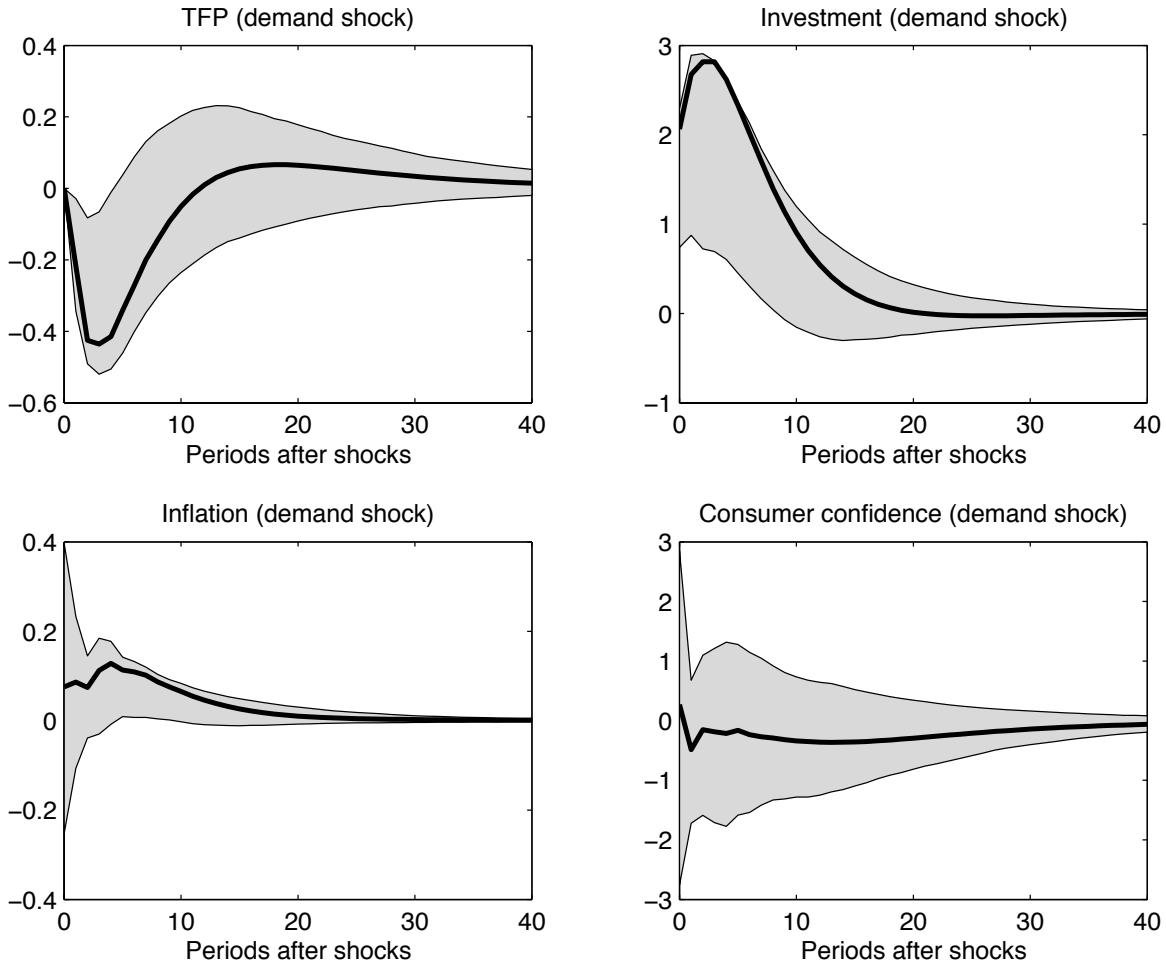
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita investment, the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2011:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 2: IRFs to a news shock (SVECM & Investment)



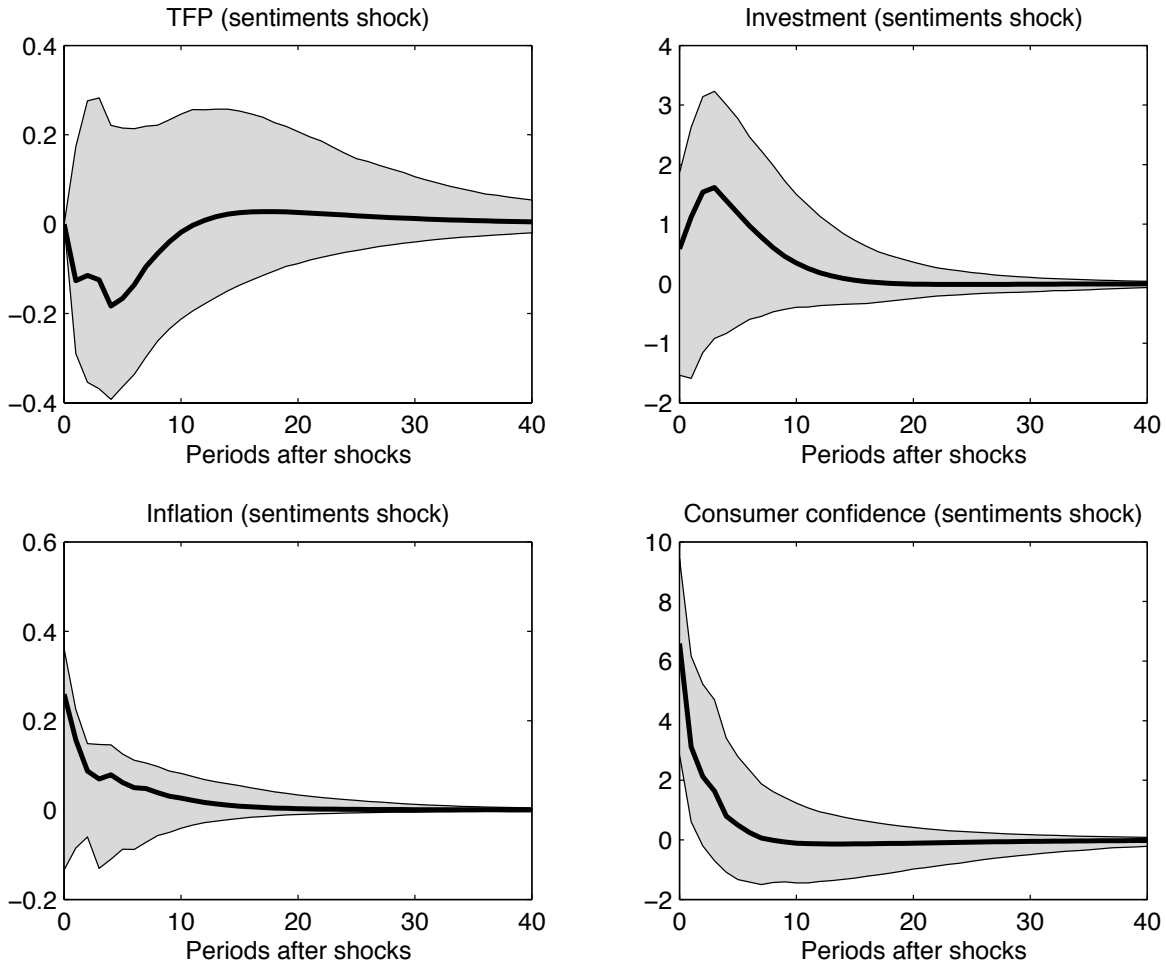
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita investment, the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2011:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 3: IRFs to a demand shock (SVECM & Investment)



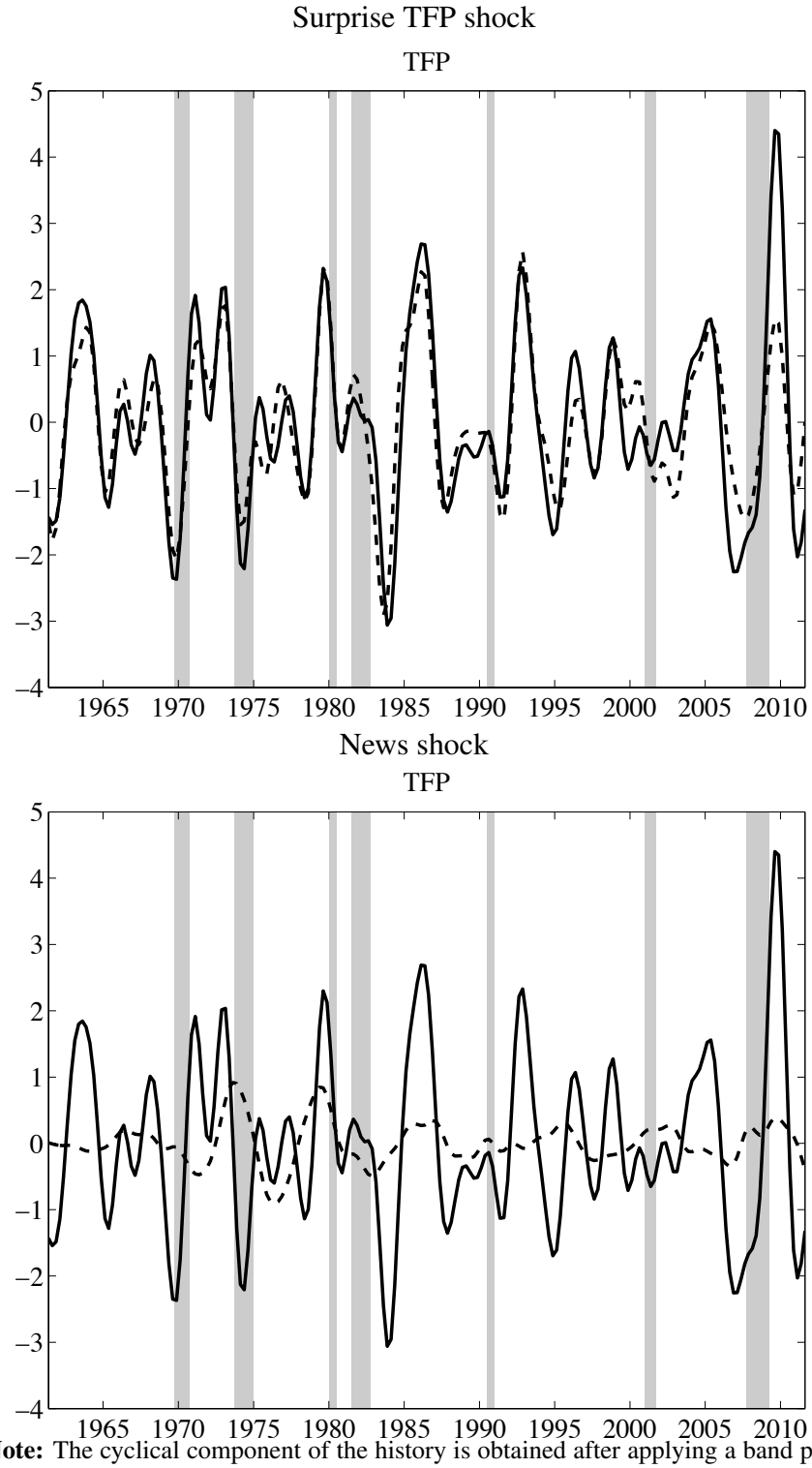
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita investment, the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2011:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 4: IRFs to a sentiment shock (SVECM & Investment)



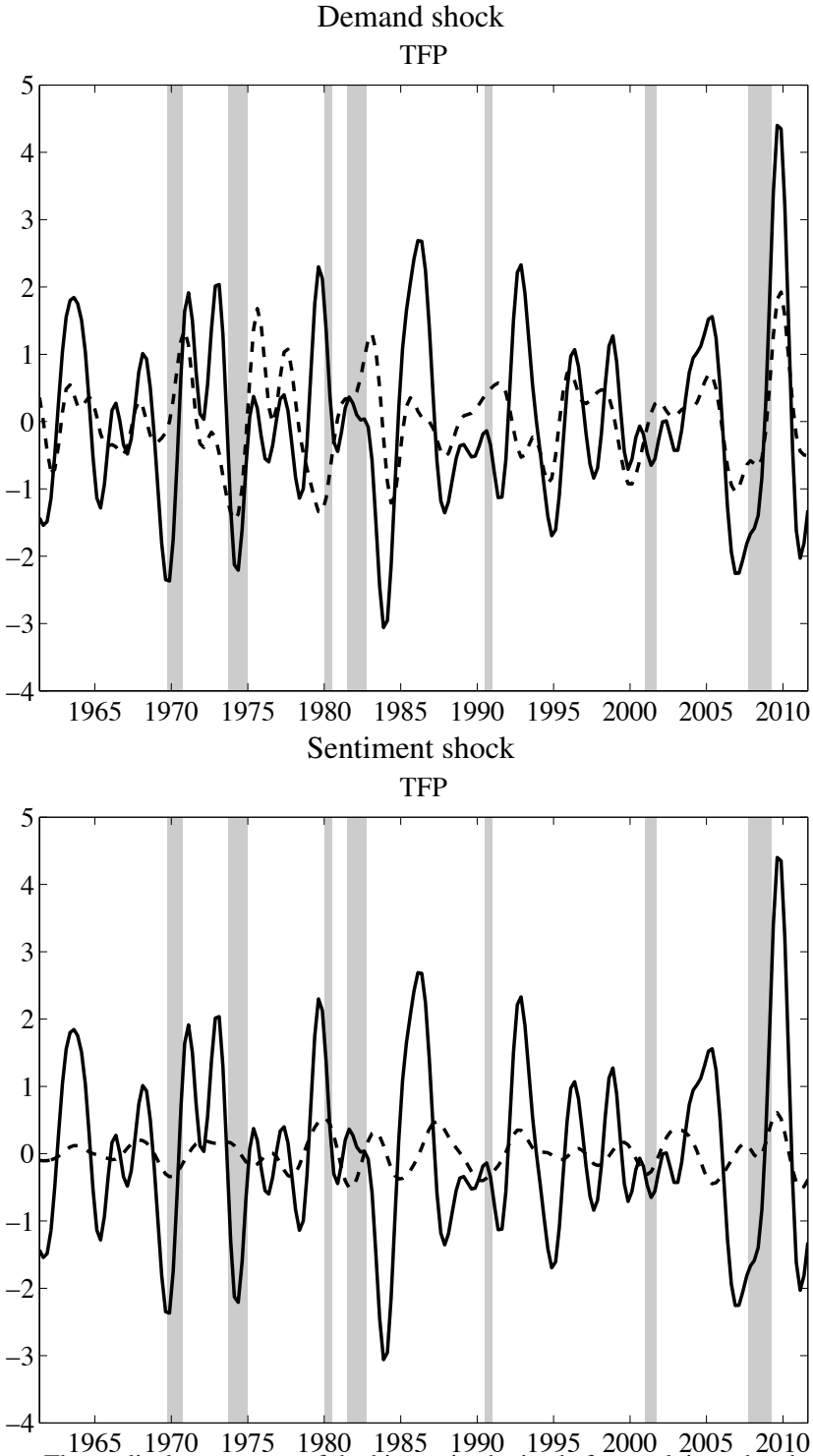
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita investment, the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2011:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 5: History of TFP–Permanent Shocks (SVECM & Investment)



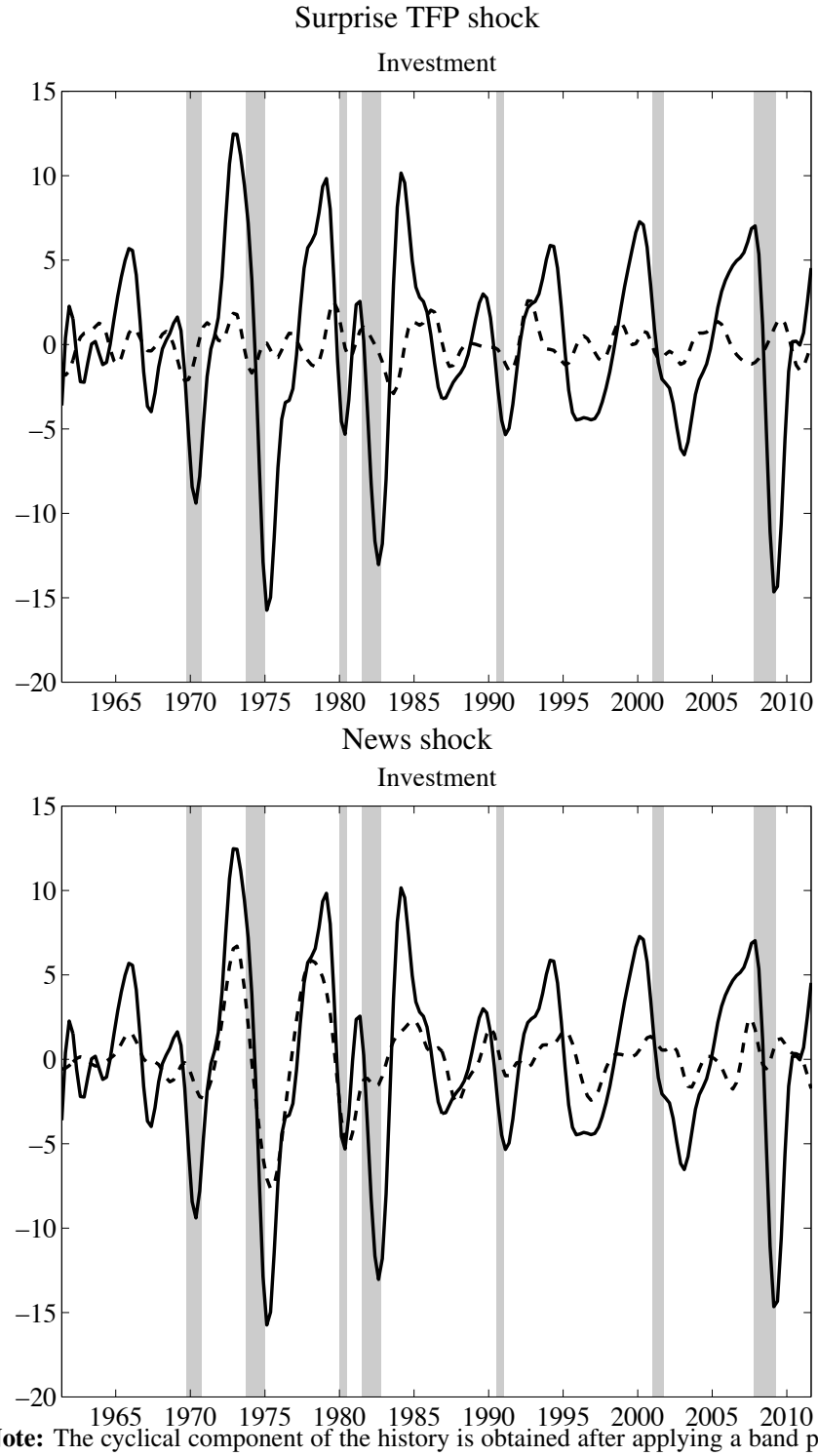
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 6: History of TFP–Transitory Shocks (SVECM & Investment)



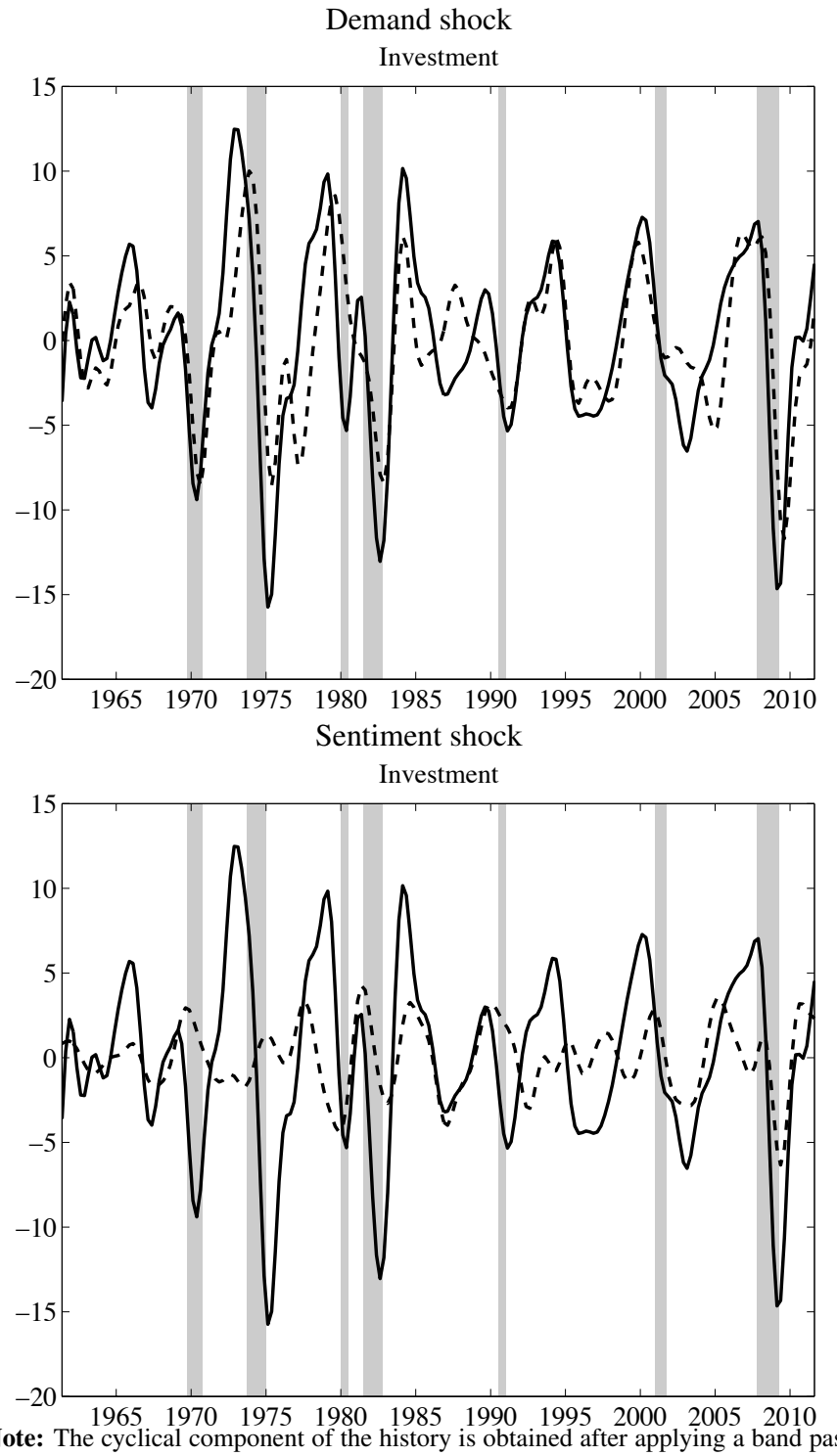
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 7: History of Investment–Permanent Shocks (SVECM & Investment)



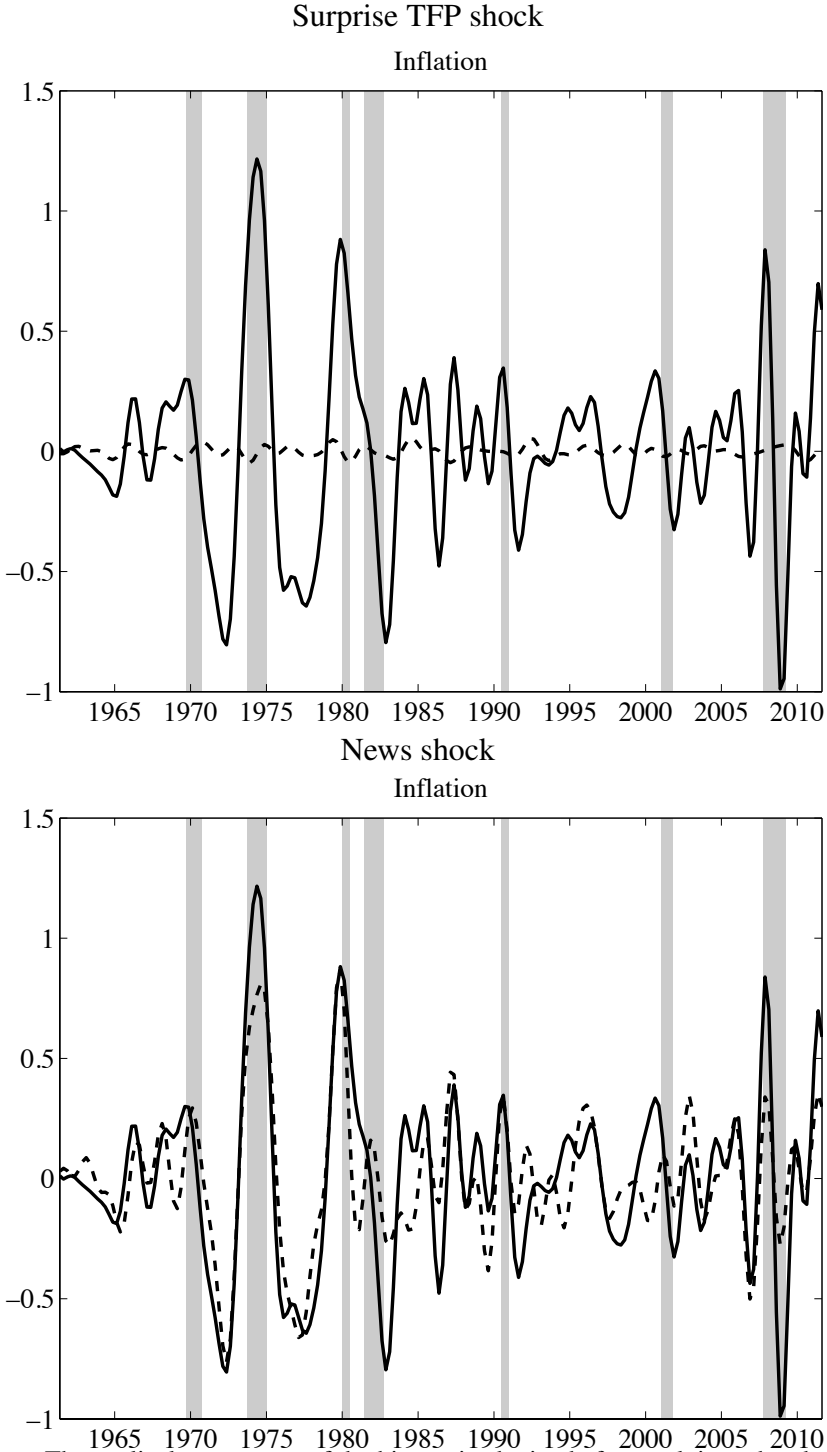
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 8: History of Investment–Transitory Shocks (SVECM & Investment)



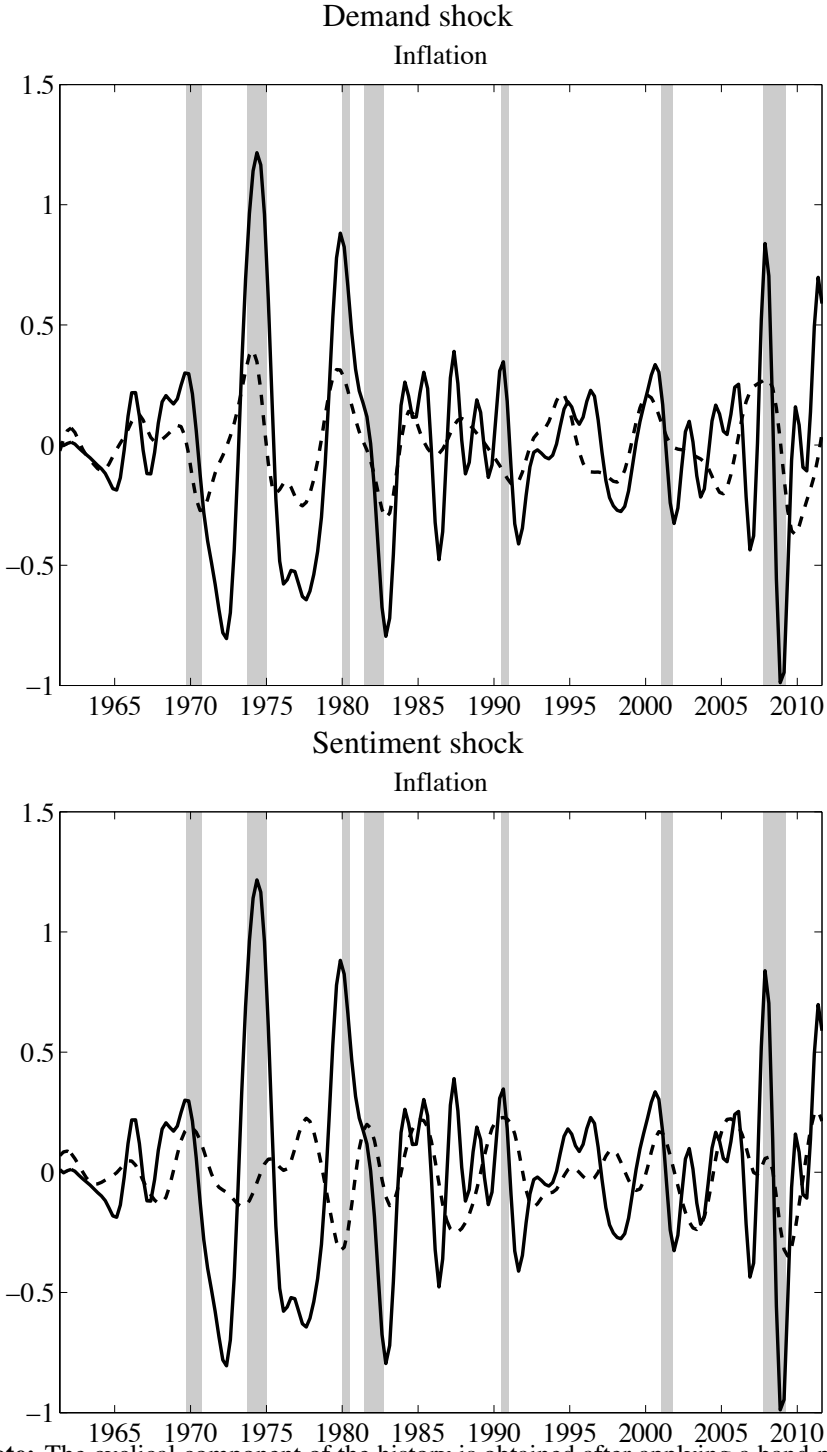
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 9: History of Inflation–Permanent Shocks (SVECM & Investment)



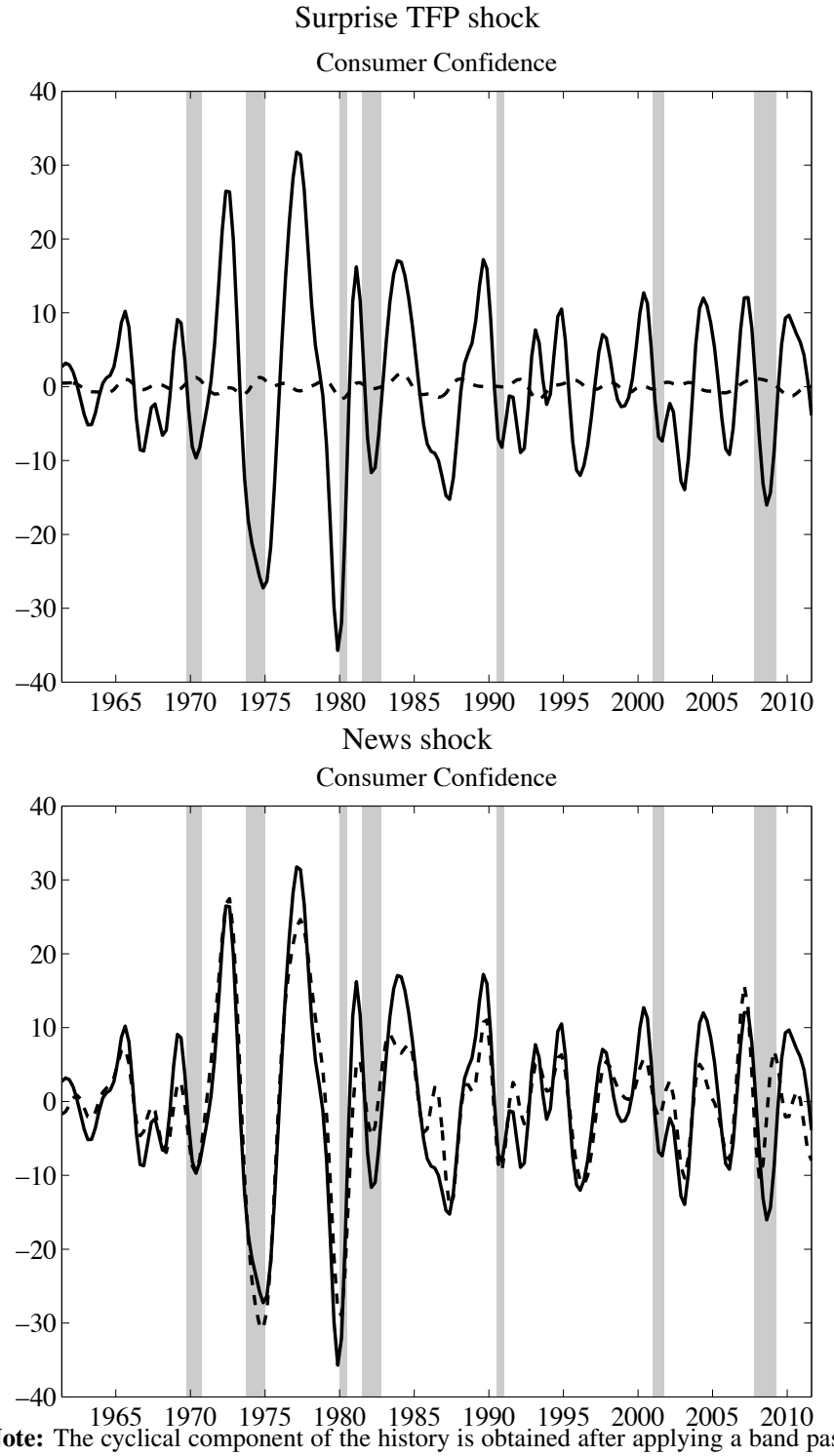
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 10: History of Inflation–Transitory Shocks (SVECM & Investment)



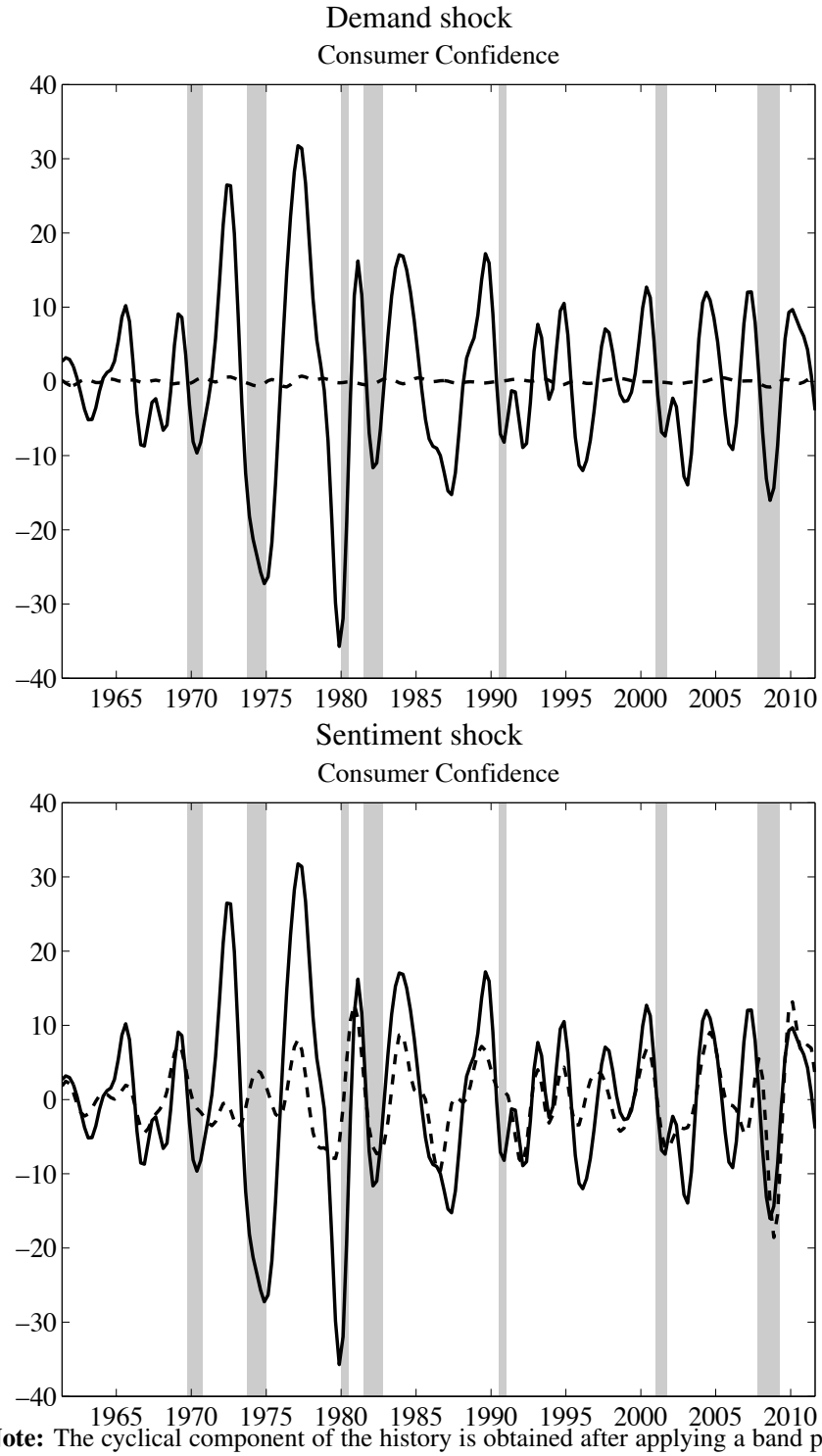
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 11: History of Consumer Confidence–Permanent Shocks (SVECM & Investment)



Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

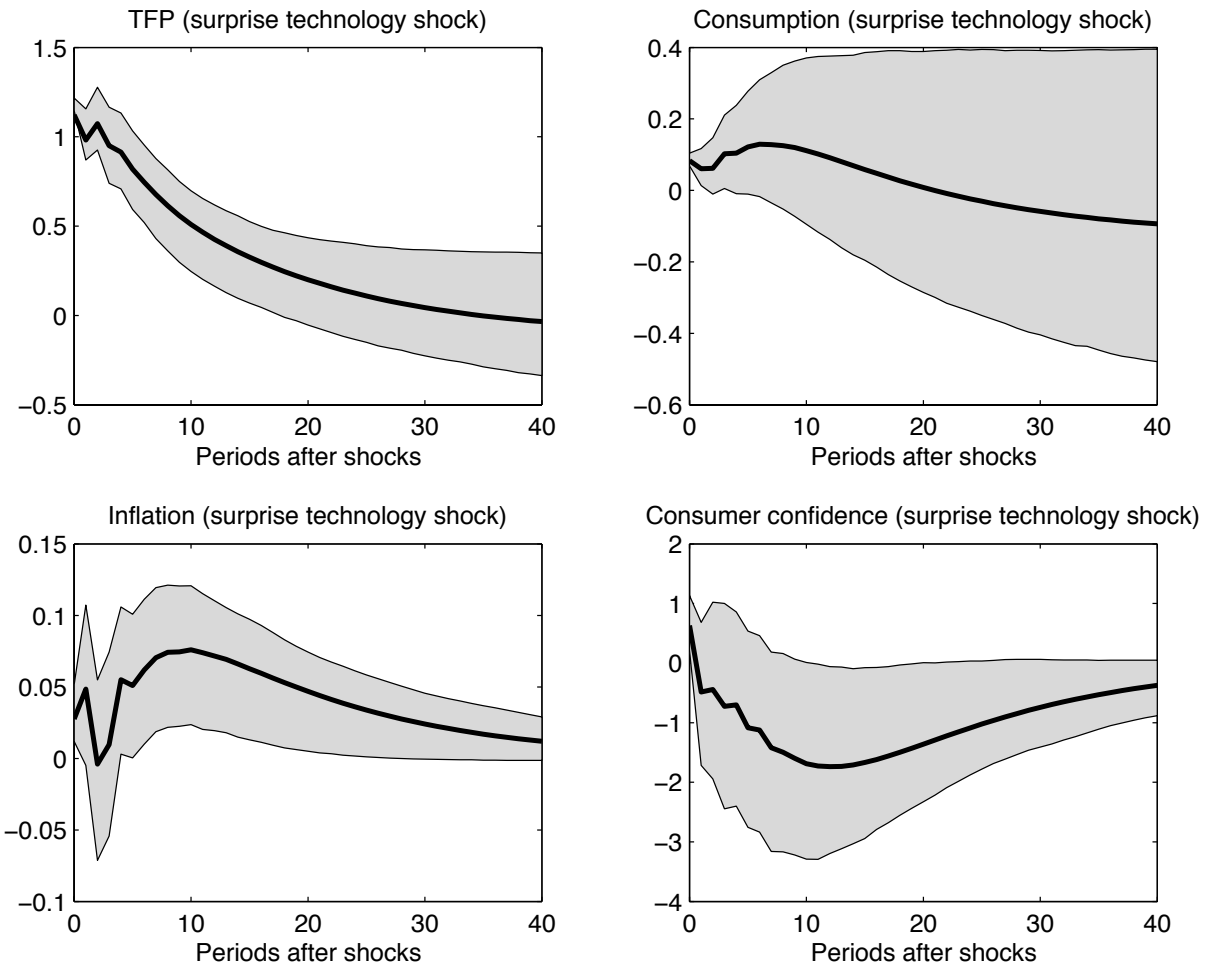
Figure 12: History of Consumer Confidence–Transitory Shocks (SVECM & Investment)



Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

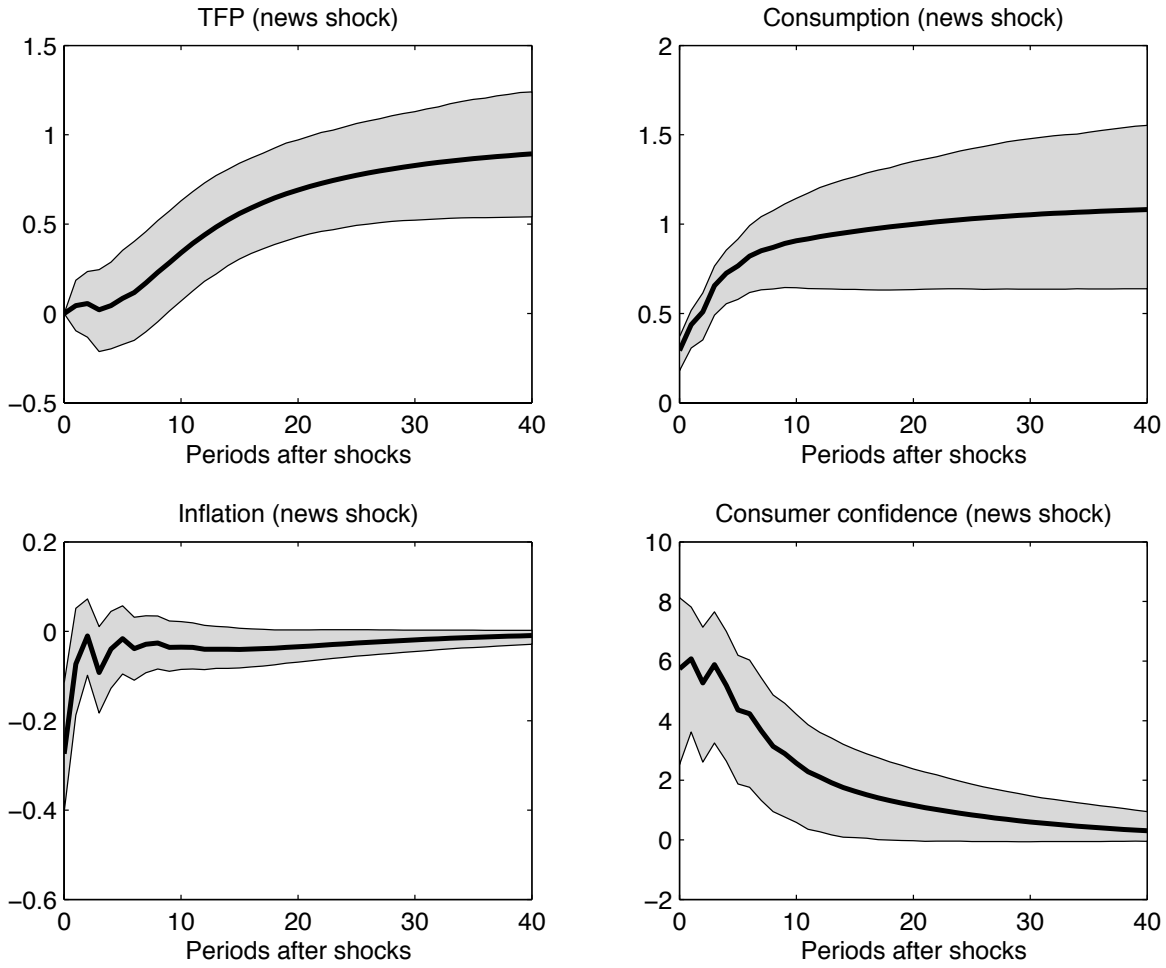
2 Dynamic Responses and History: Consumption

Figure 13: IRFs to a surprise TFP shock (SVECM & Consumption)



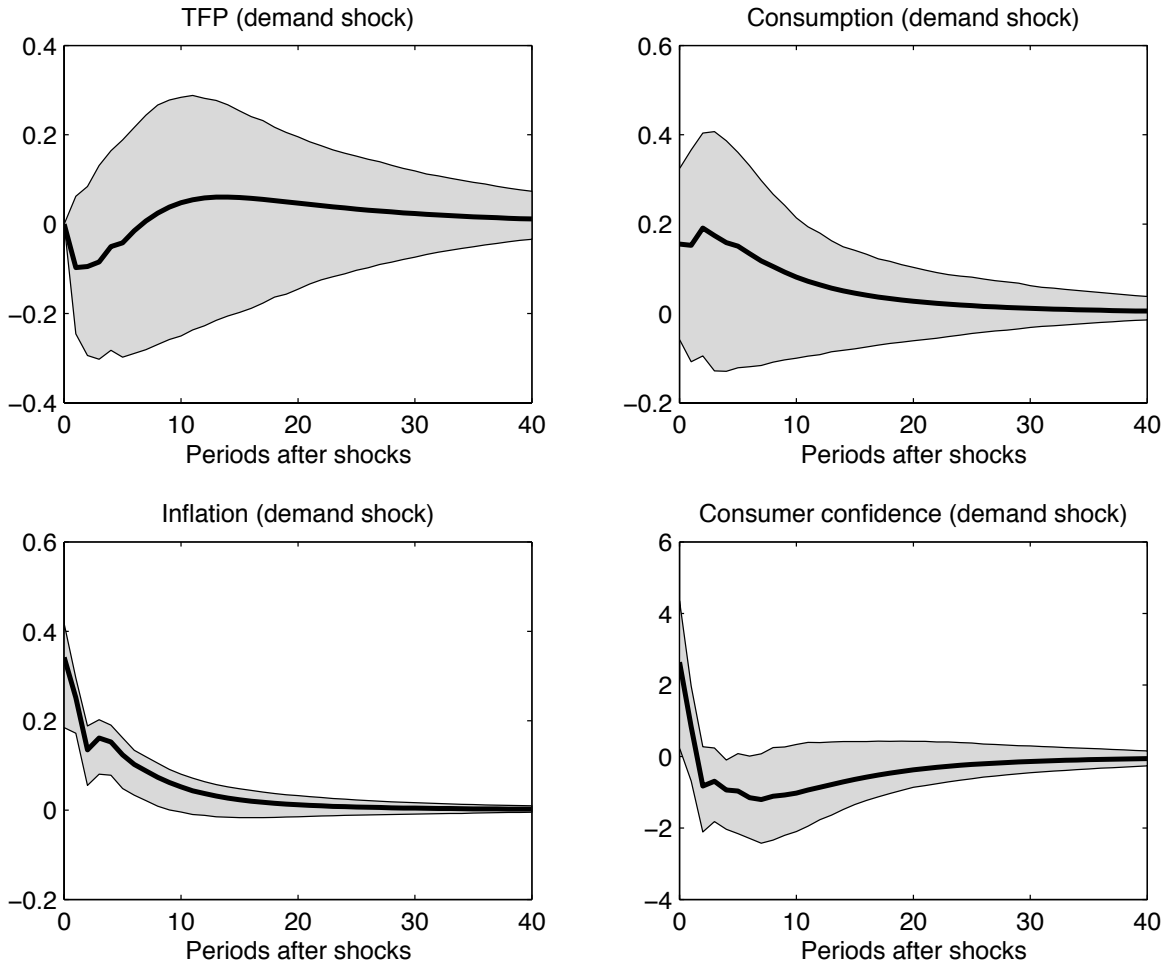
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita consumption (non-durable & service), the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2011:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 14: IRFs to a news shock (SVECM & Consumption)



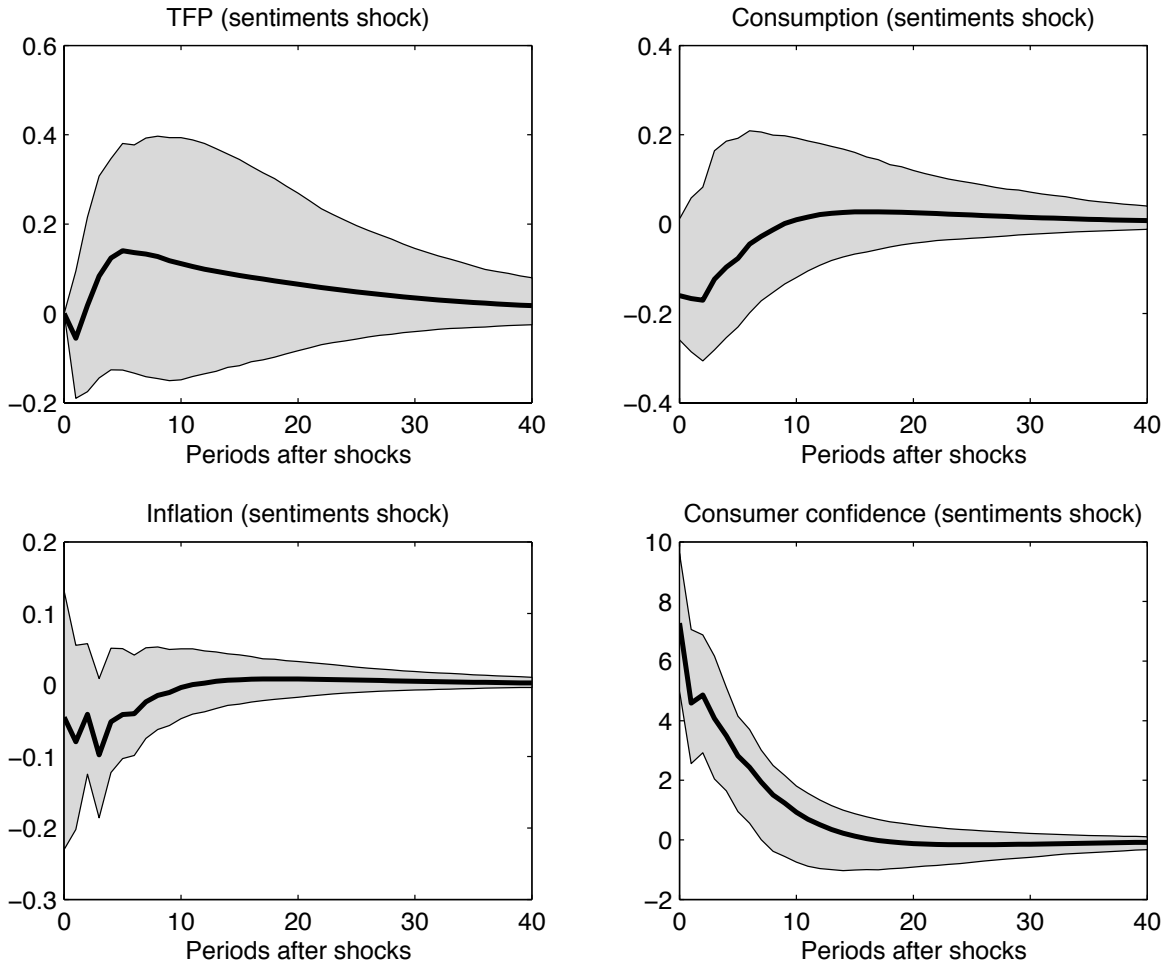
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita consumption (non-durable & service), the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2011:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 15: IRFs to a demand shock (SVECM & Consumption)



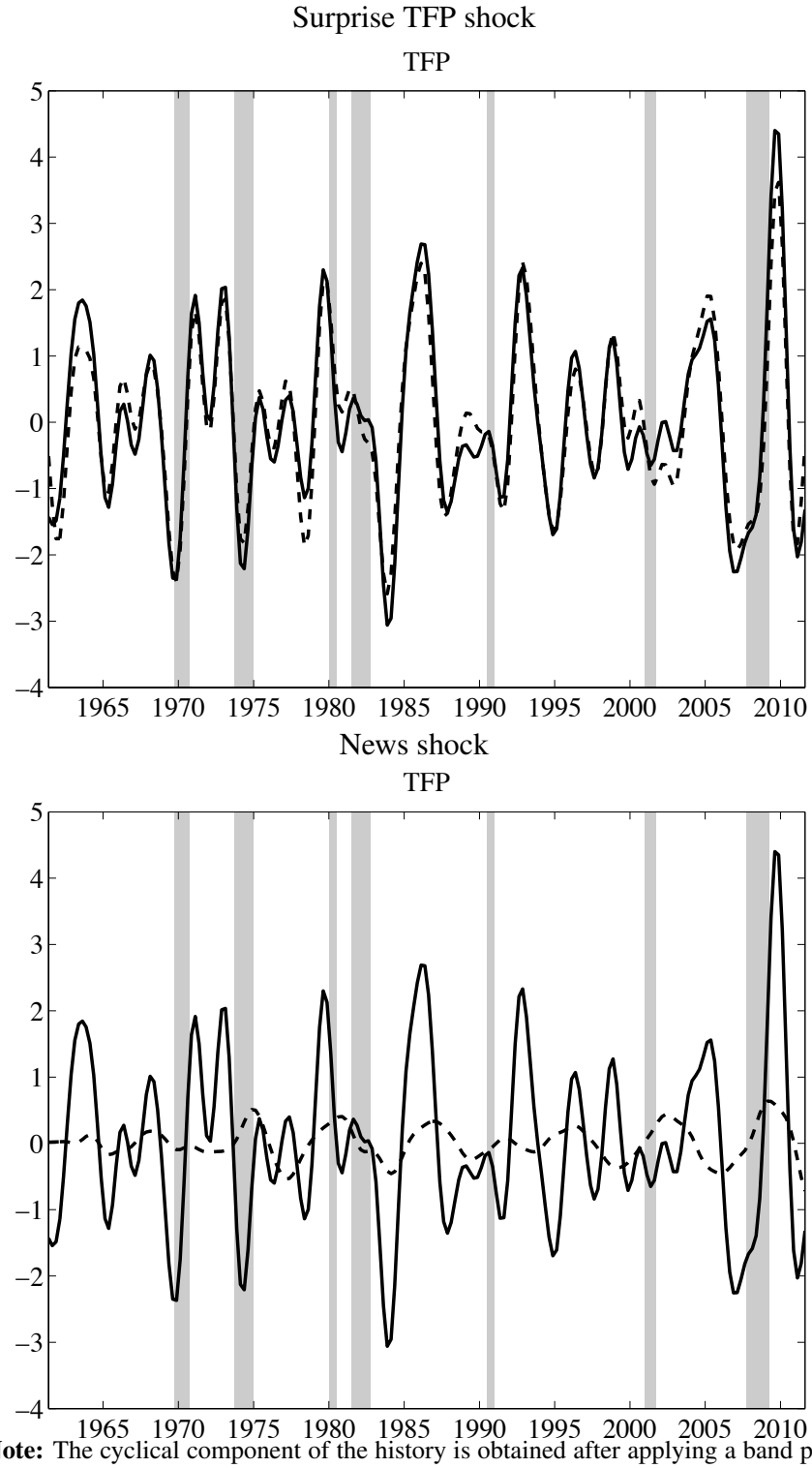
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita consumption (non-durable & service), the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2011:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 16: IRFs to a sentiment shock (SVECM & Consumption)



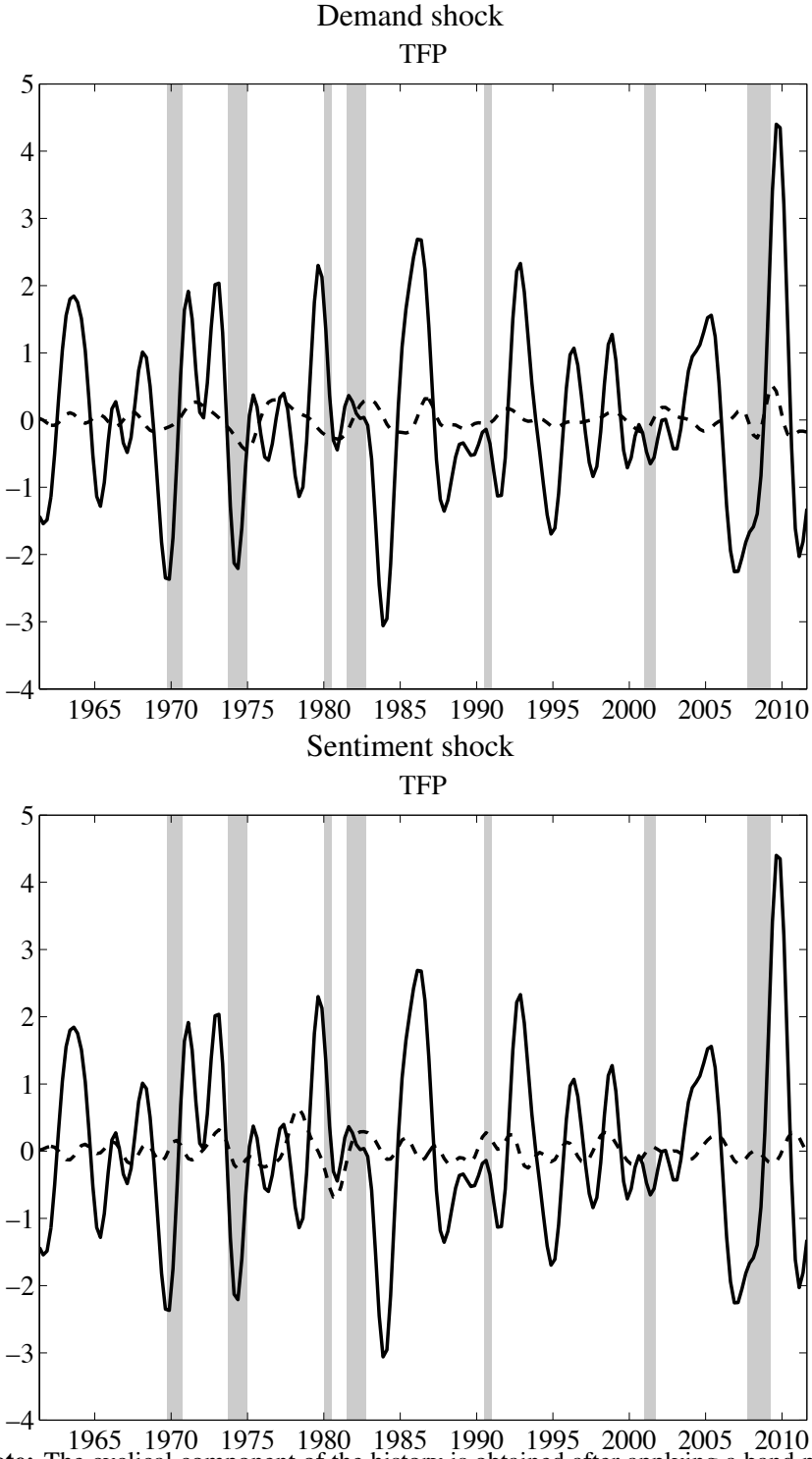
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita consumption (non-durable & service), the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2011:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 17: History of TFP–Permanent Shocks (SVECM & Consumption)



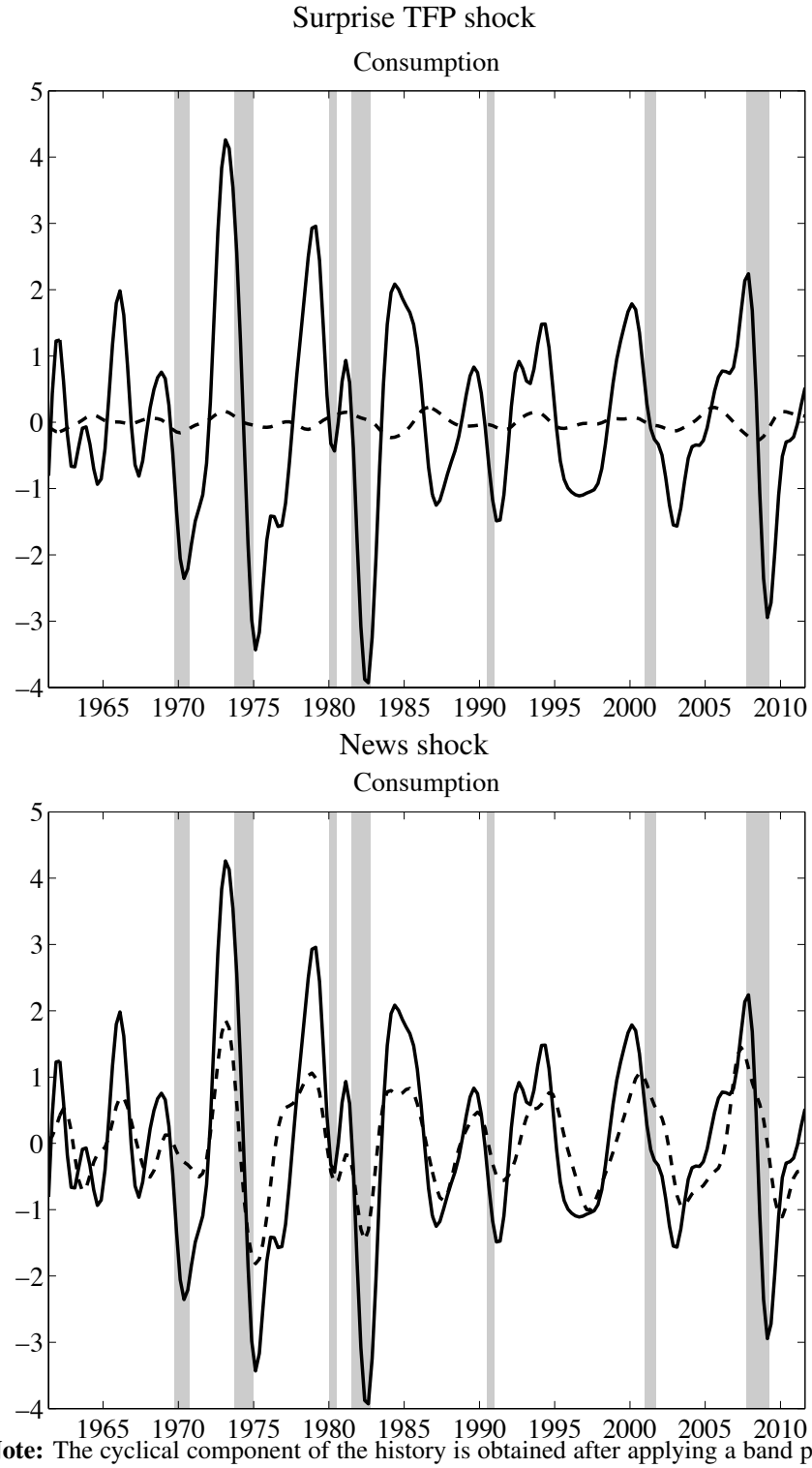
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 18: History of TFP–Transitory Shocks (SVECM & Consumption)



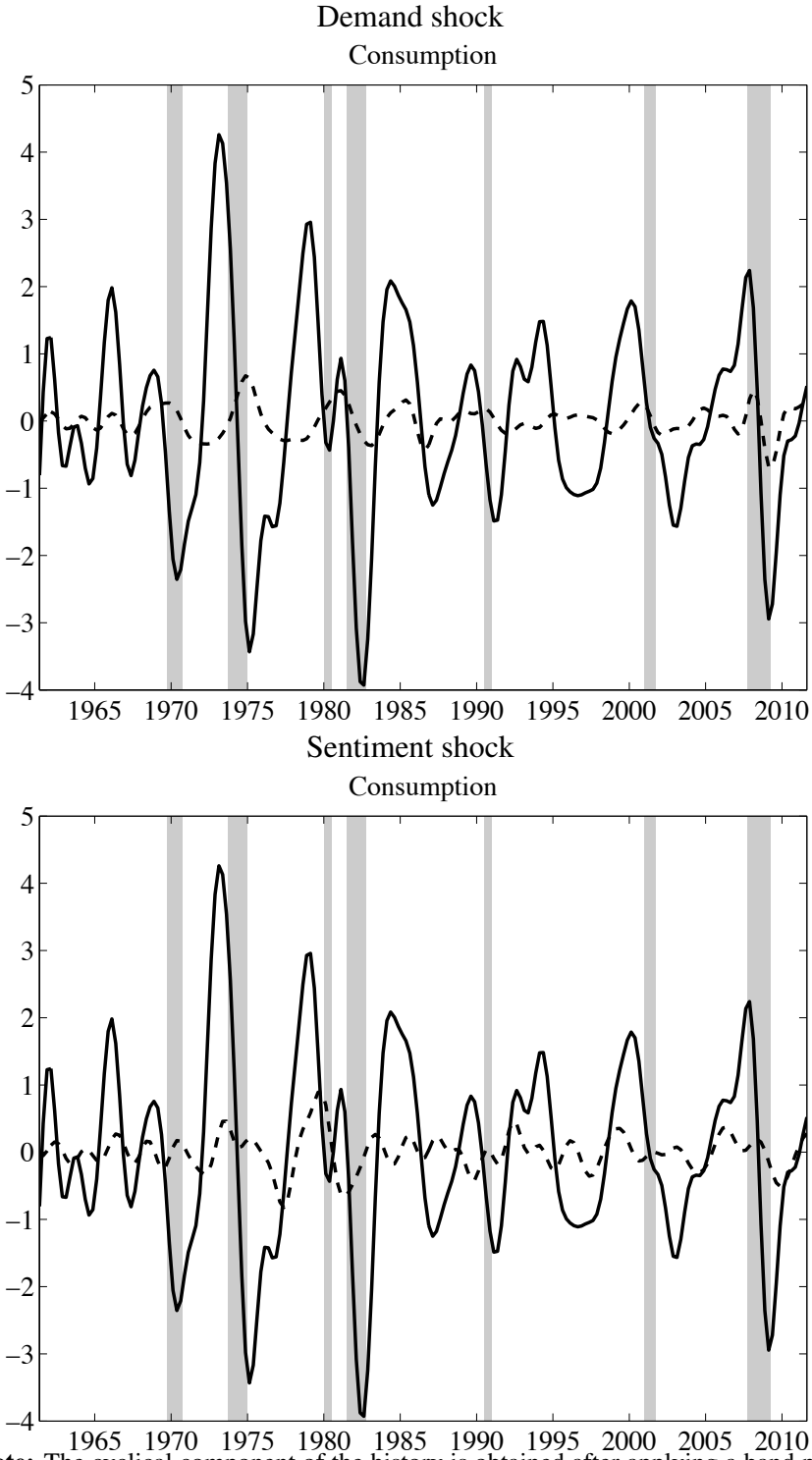
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 19: History of Consumption–Permanent Shocks (SVECM & Consumption)



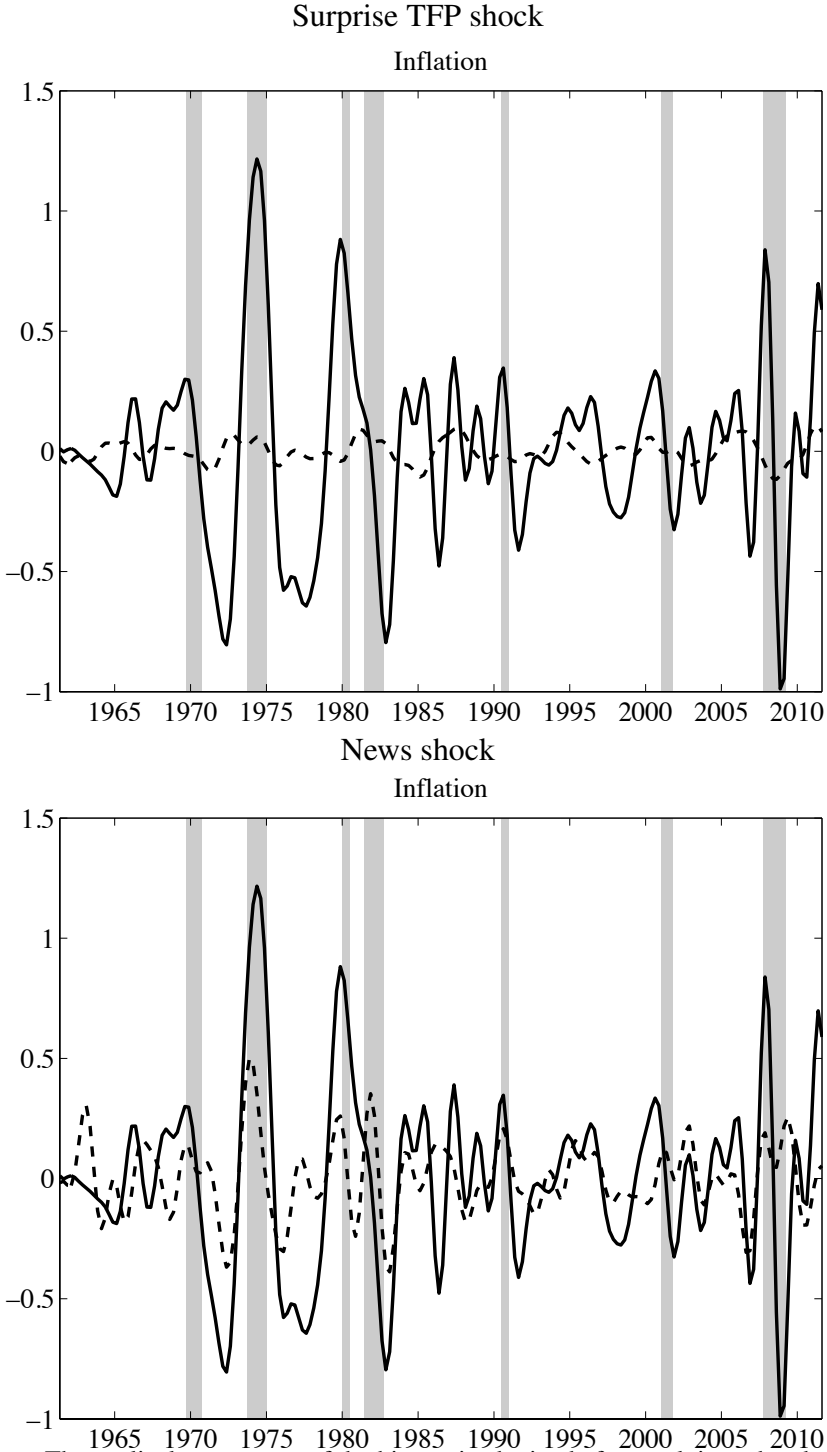
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 20: History of Consumption–Transitory Shocks (SVECM & Consumption)



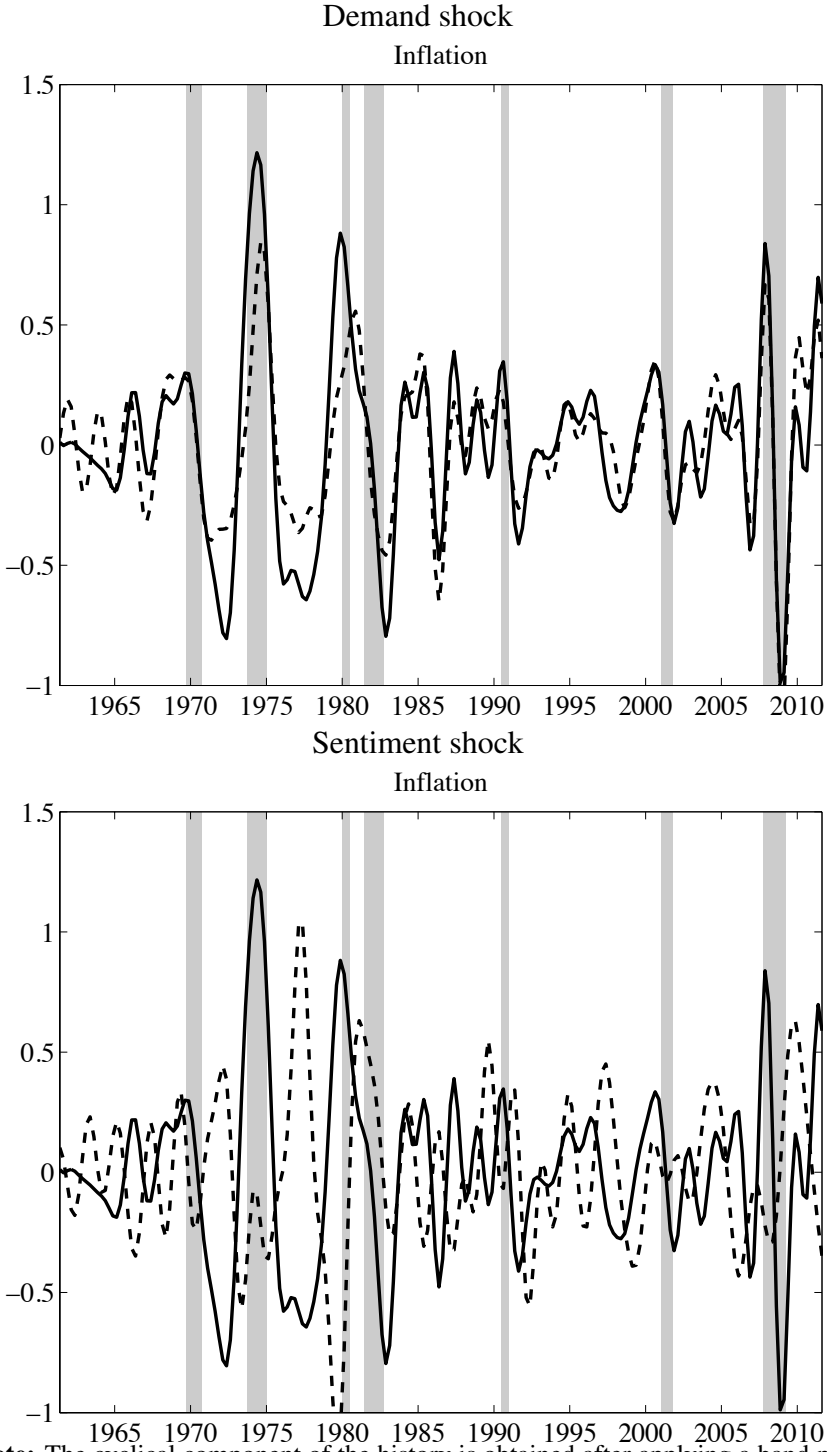
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 21: History of Inflation–Permanent Shocks (SVECM & Consumption)



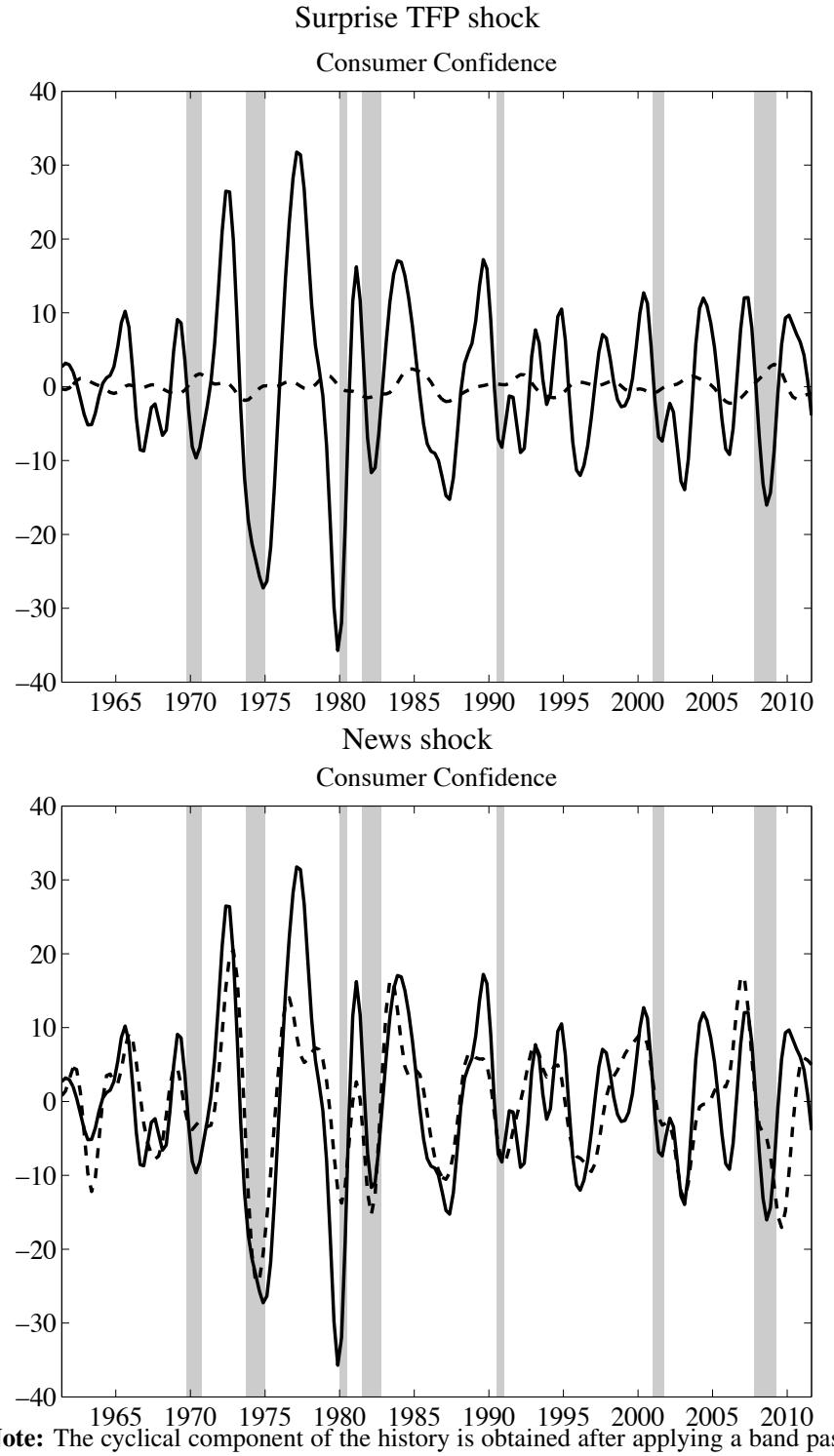
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 22: History of Inflation–Transitory Shocks (SVECM & Consumption)



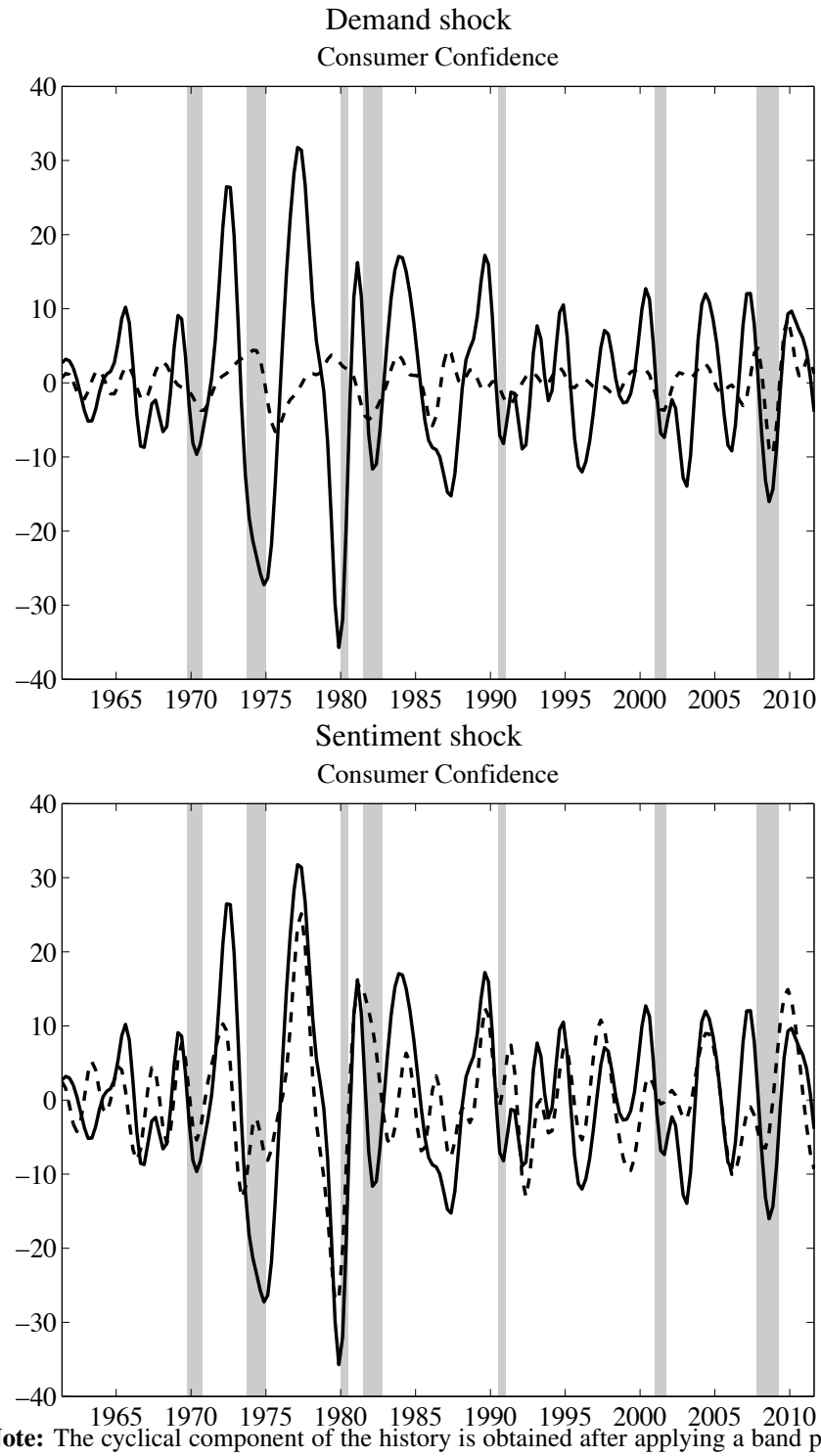
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 23: History of Consumer Confidence–Permanent Shocks (SVECM & Consumption)



Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

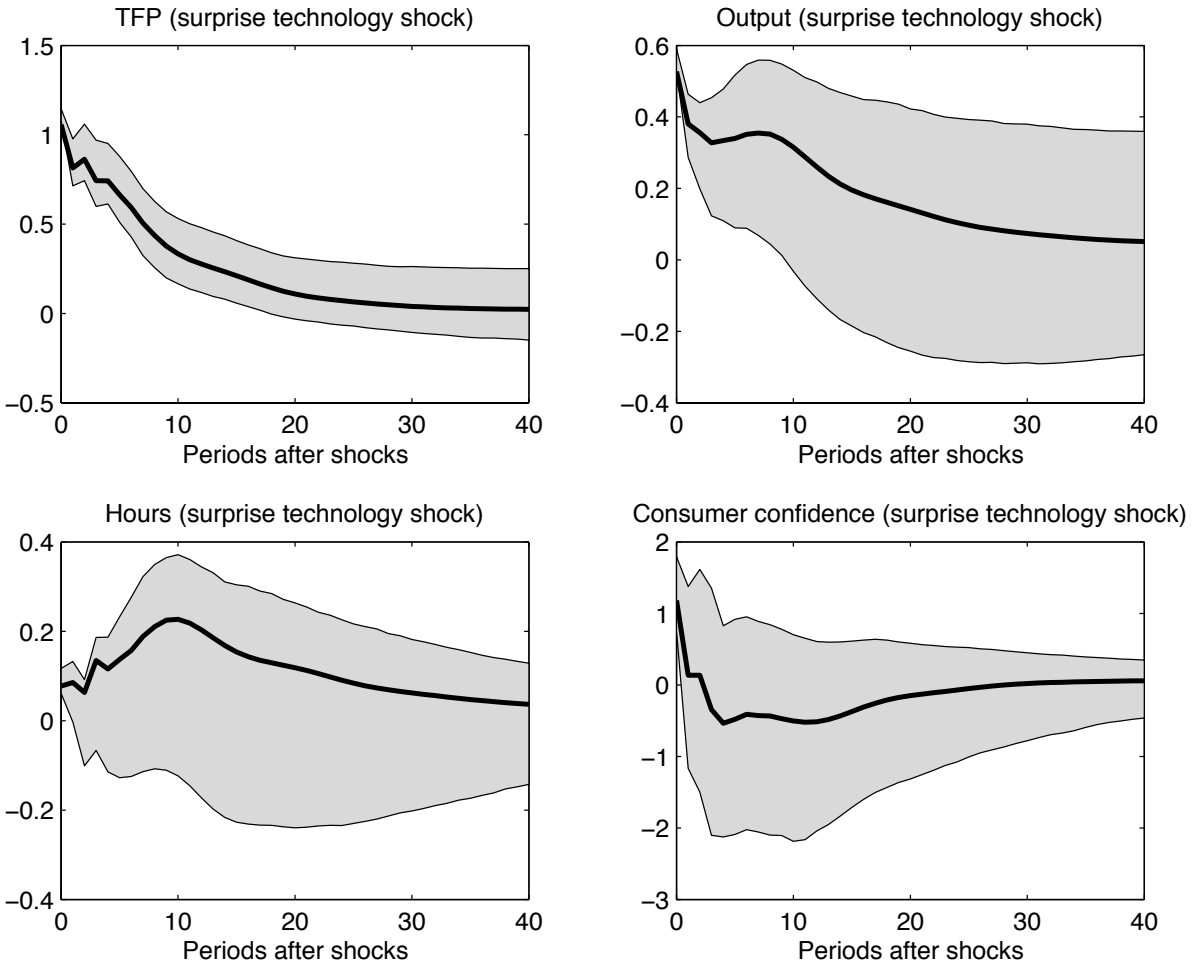
Figure 24: History of Consumer Confidence–Transitory Shocks (SVECM & Consumption)



Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

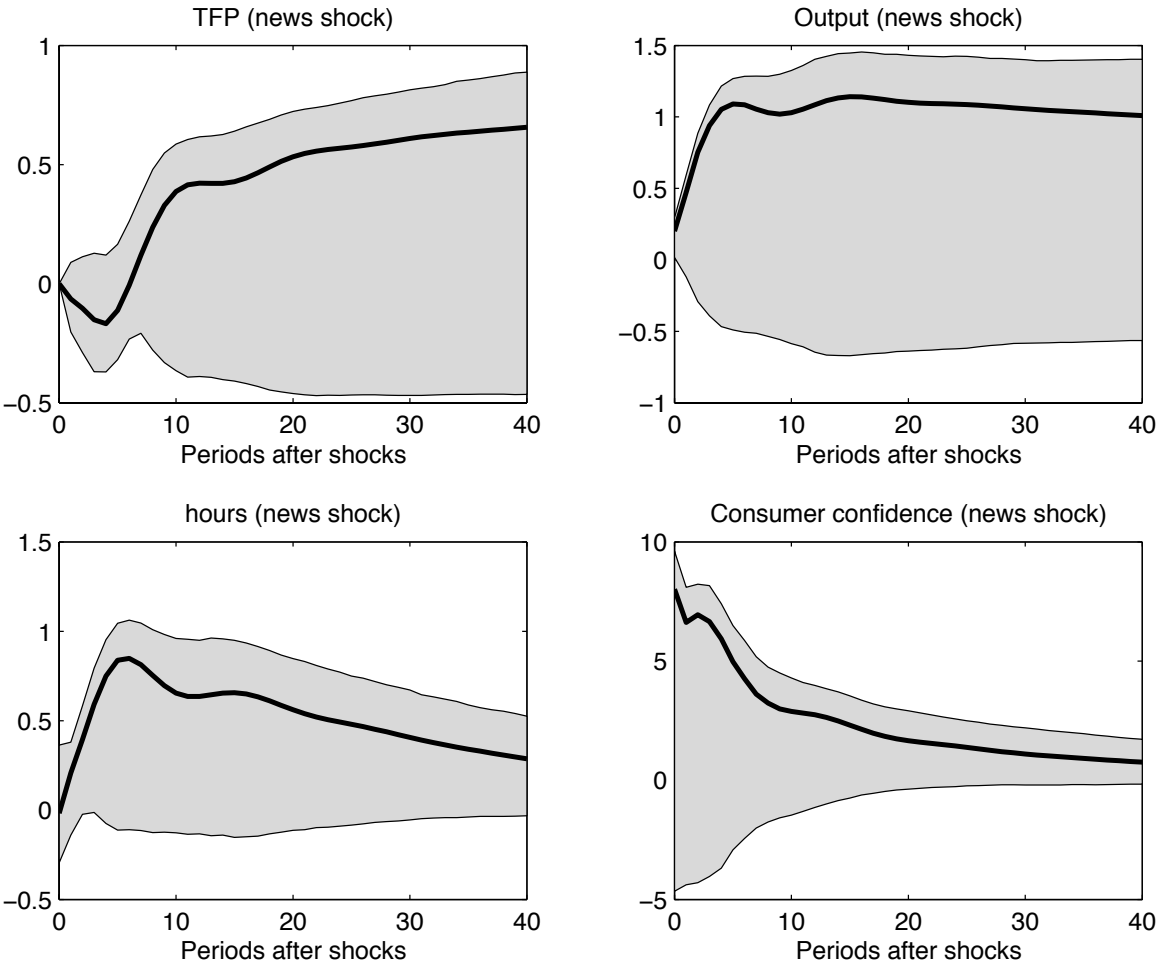
3 Dynamic Responses: Hours Worked

Figure 25: IRFs to a surprise TFP shock (SVECM & Hours)



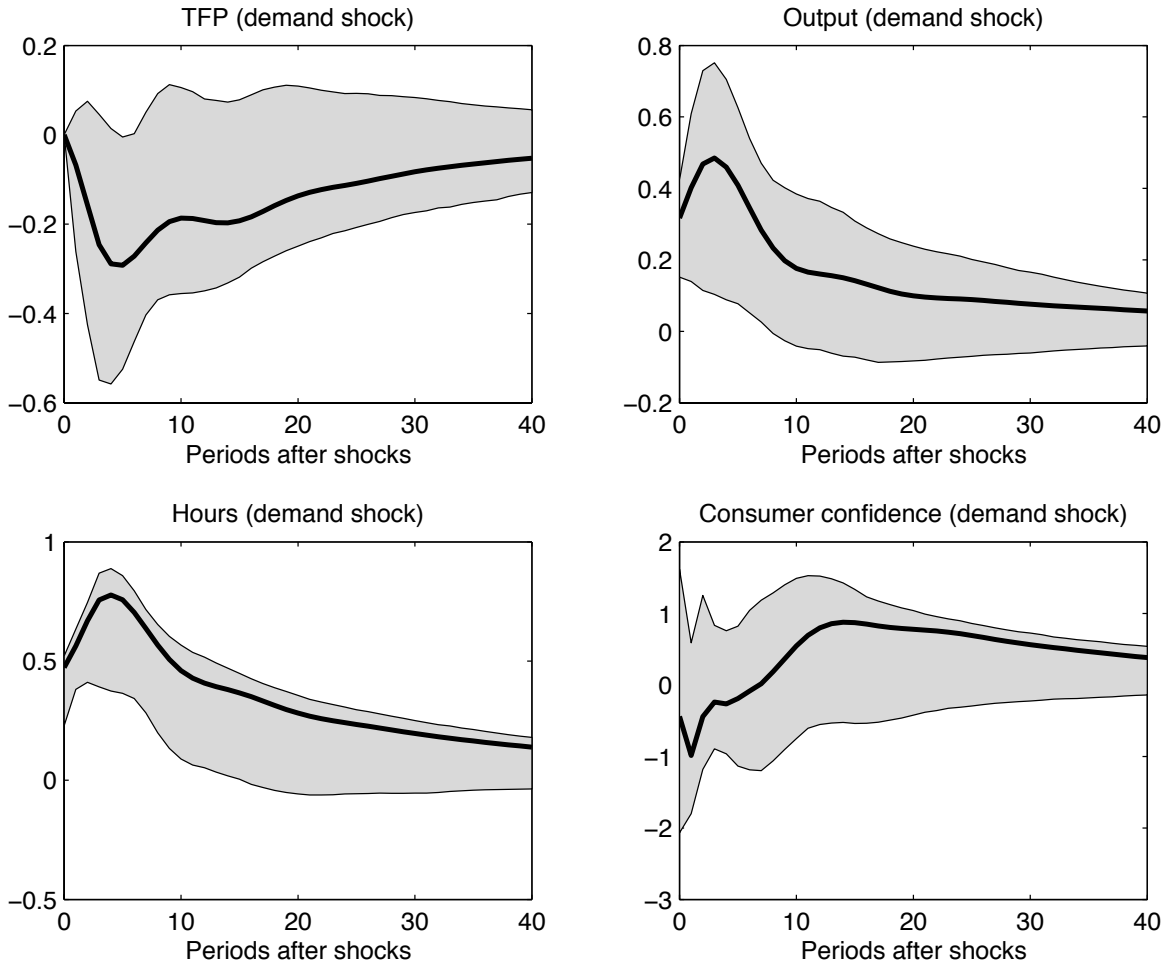
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita GDP, hours worked and the measure E5Y of consumer confidence. The sample period is 1960:1-2011:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 26: IRFs to a news shock (SVECM & Hours)



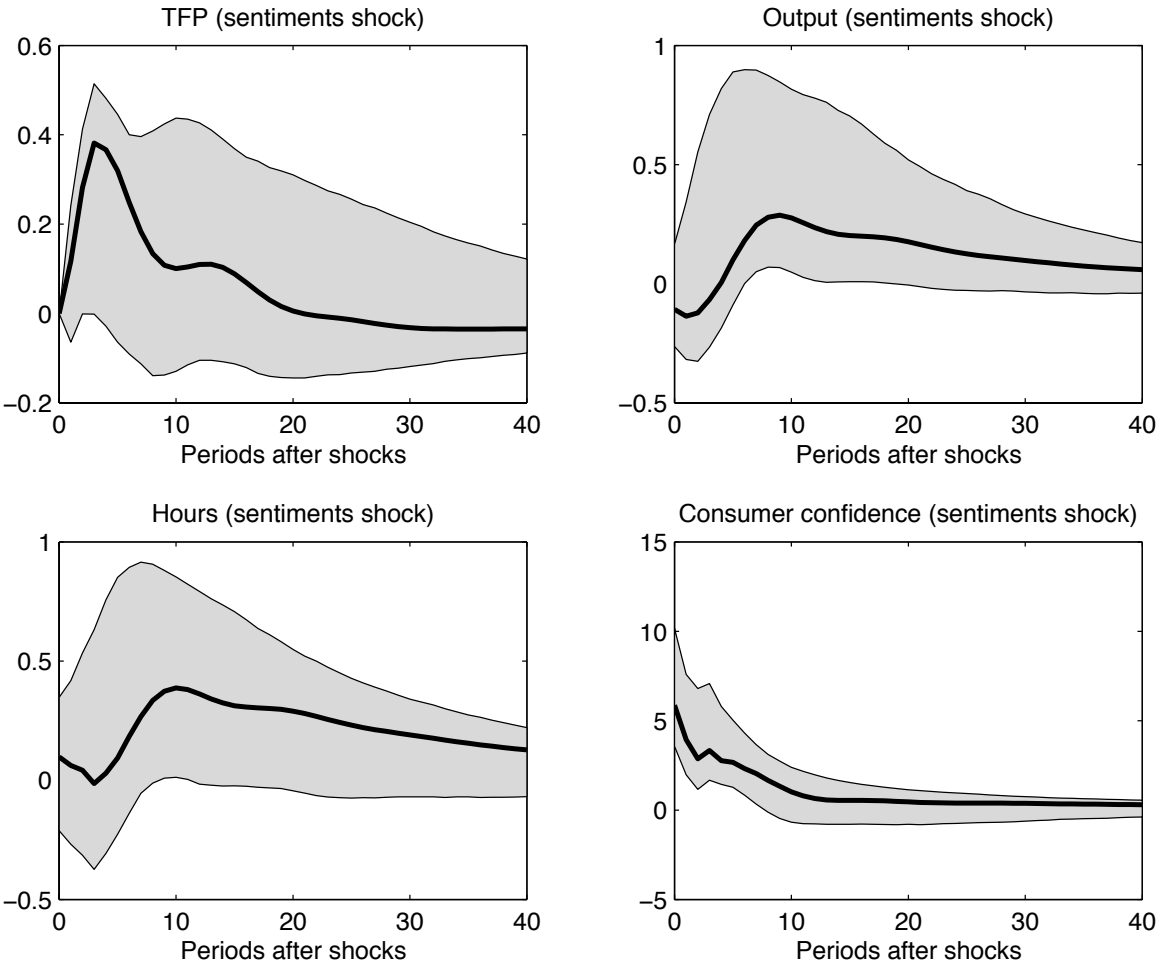
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita GDP, hours worked and the measure E5Y of consumer confidence. The sample period is 1960:1-2011:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 27: IRFs to a demand shock (SVECM & Hours)



Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita GDP, hours worked and the measure E5Y of consumer confidence. The sample period is 1960:1-2011:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

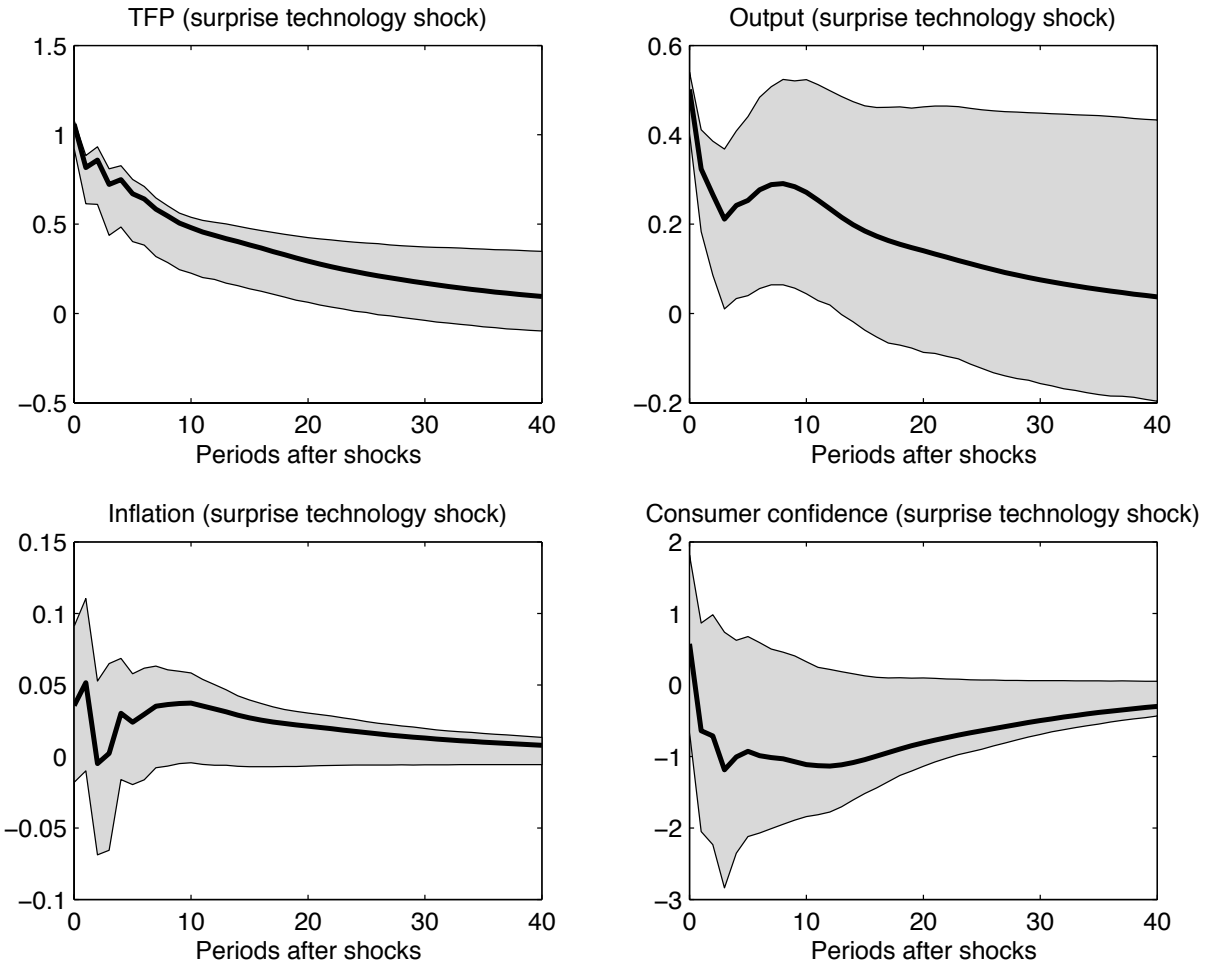
Figure 28: IRFs to a sentiment shock (SVECM & Hours)



Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita GDP, hours worked and the measure E5Y of consumer confidence. The sample period is 1960:1-2011:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

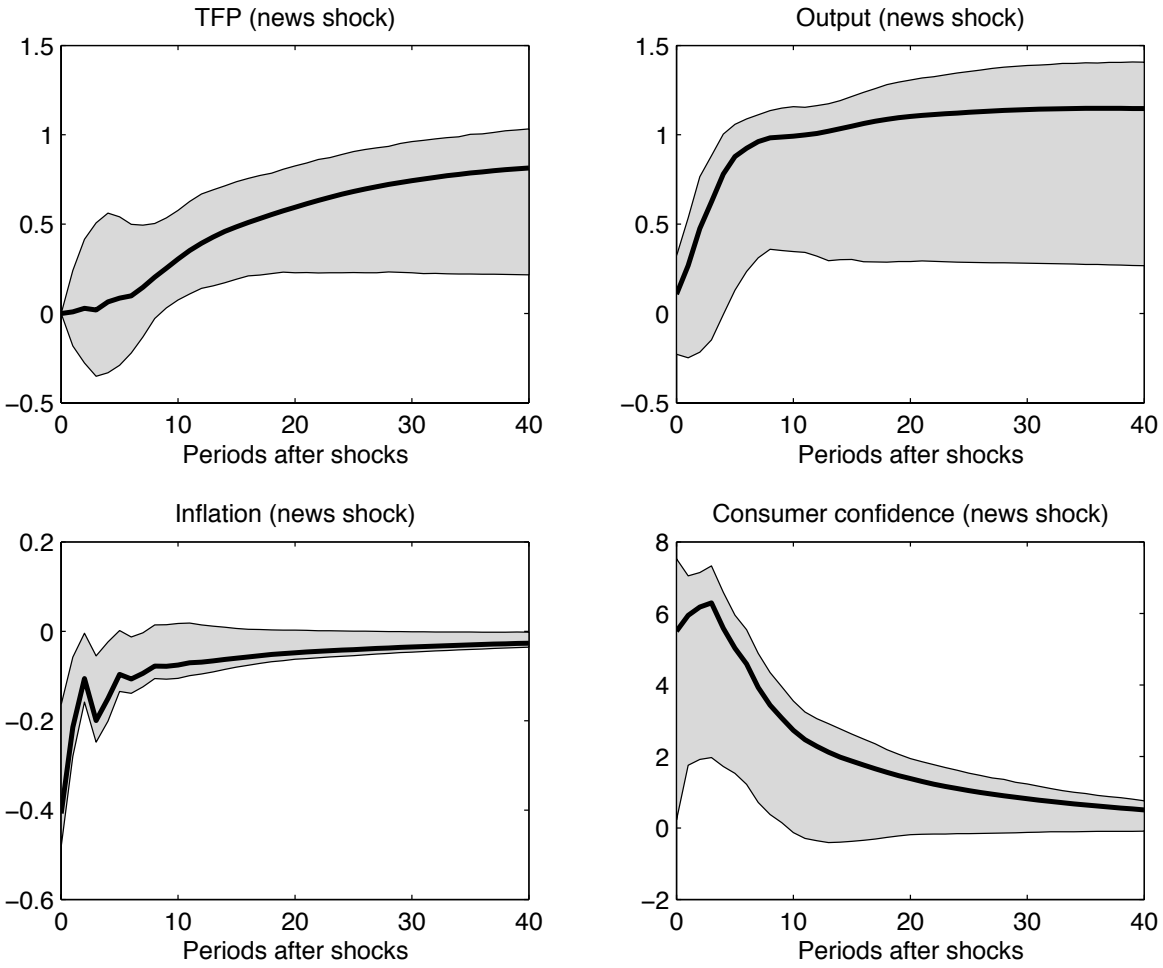
4 Dynamic Responses and History: Barsky & Sims (BS) Identification of News Shocks

Figure 29: IRFs to a surprise TFP shock (BS & GDP)



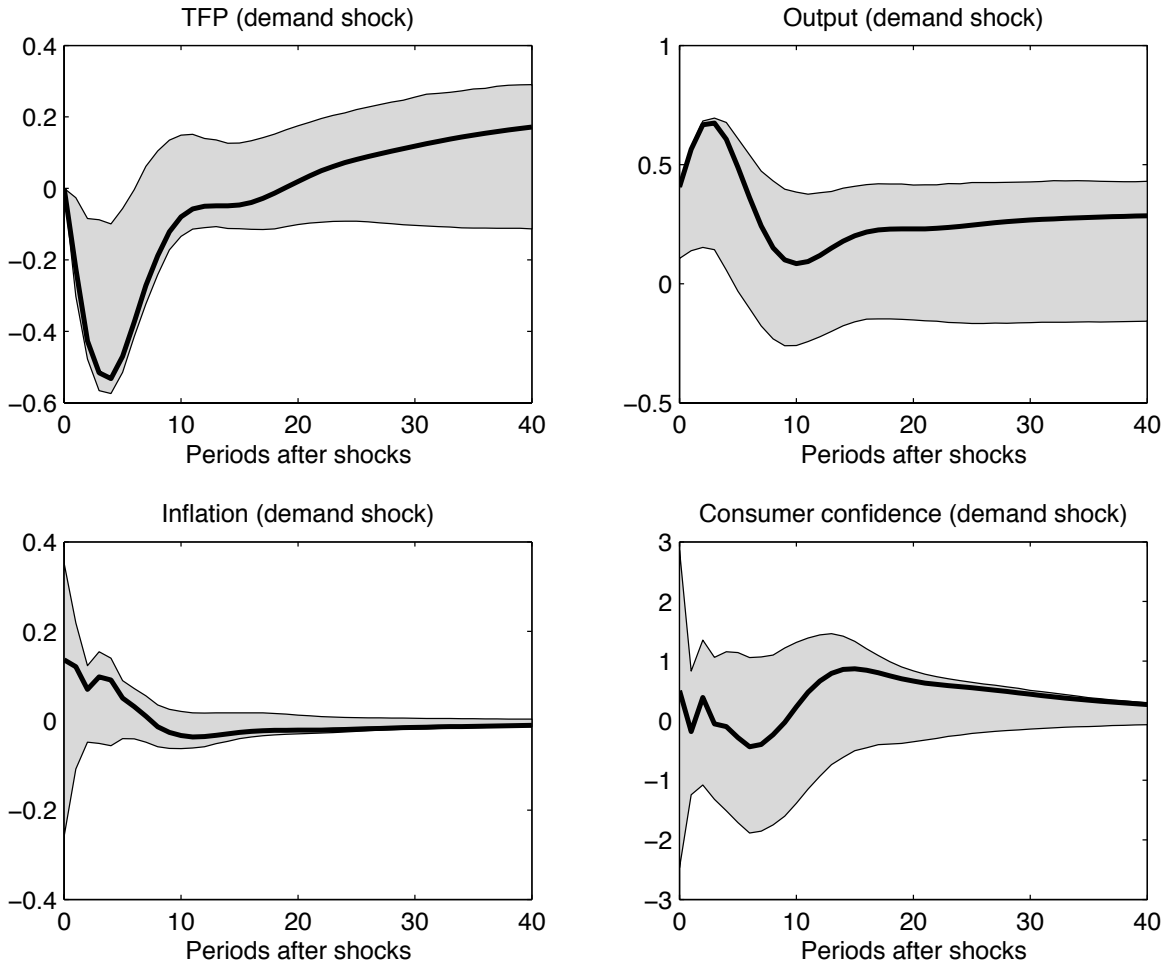
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita GDP, the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2011:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 30: IRFs to a news shock (BS & GDP)



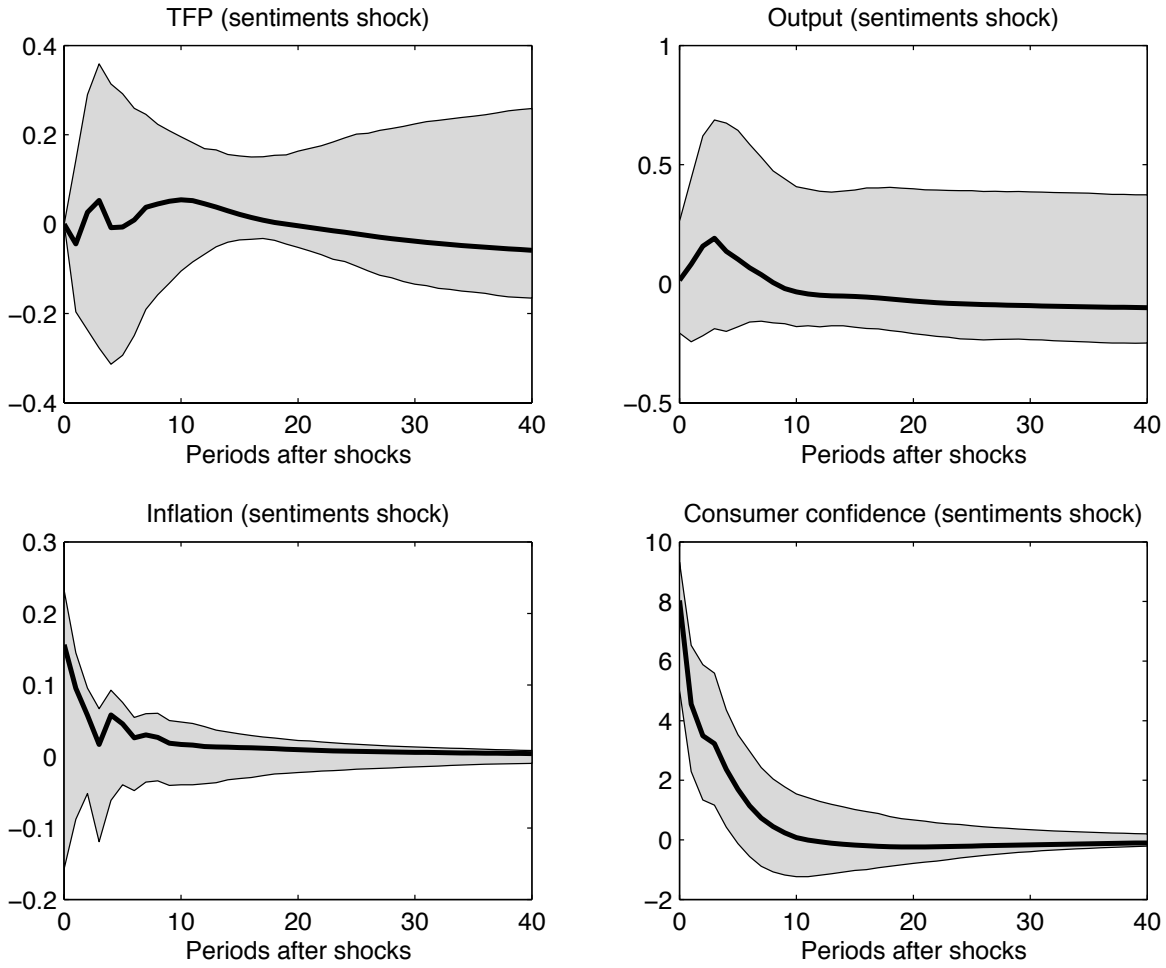
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita GDP, the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2011:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 31: IRFs to a demand shock (BS & GDP)



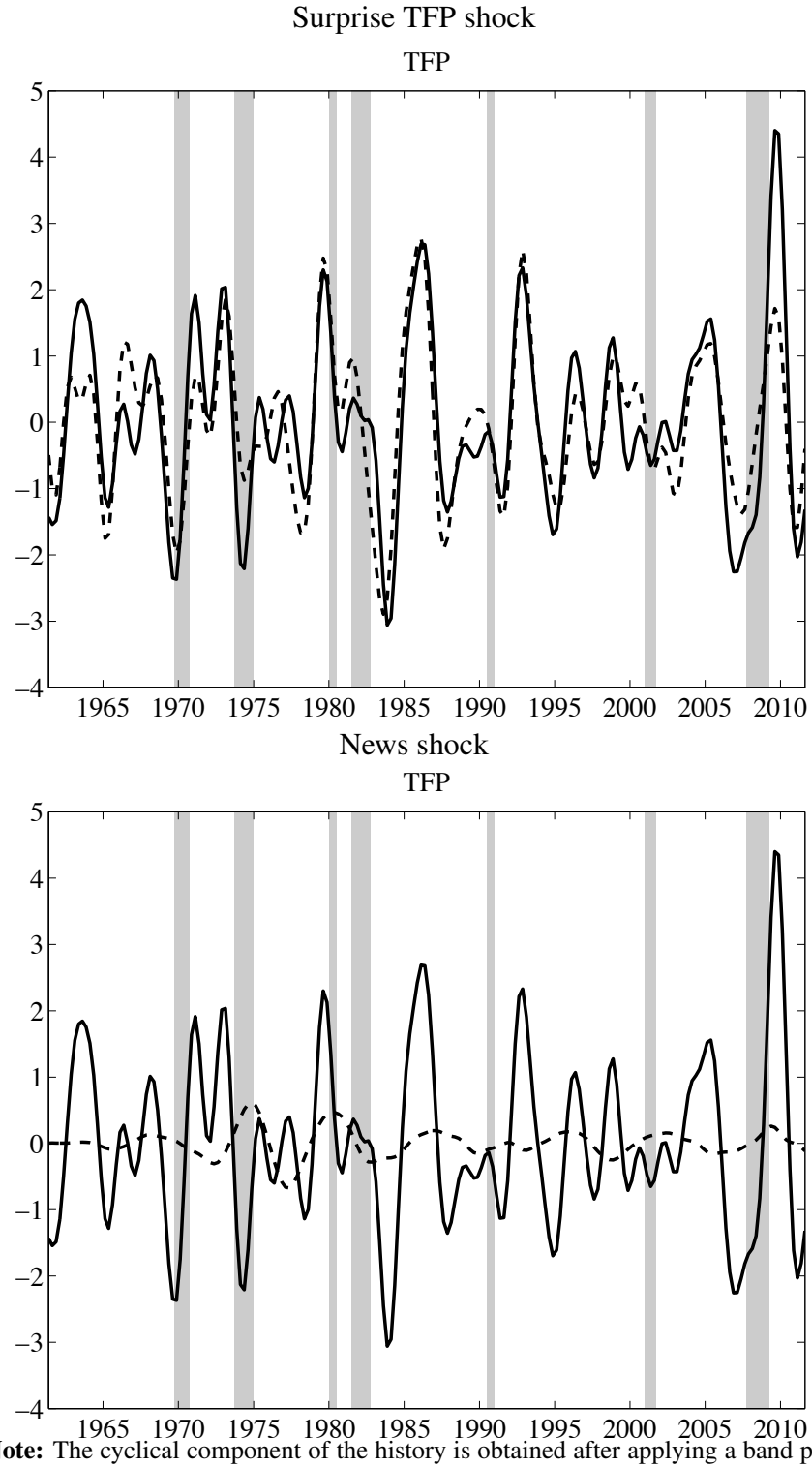
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita GDP, the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2011:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 32: IRFs to a sentiment shock (BS & GDP)



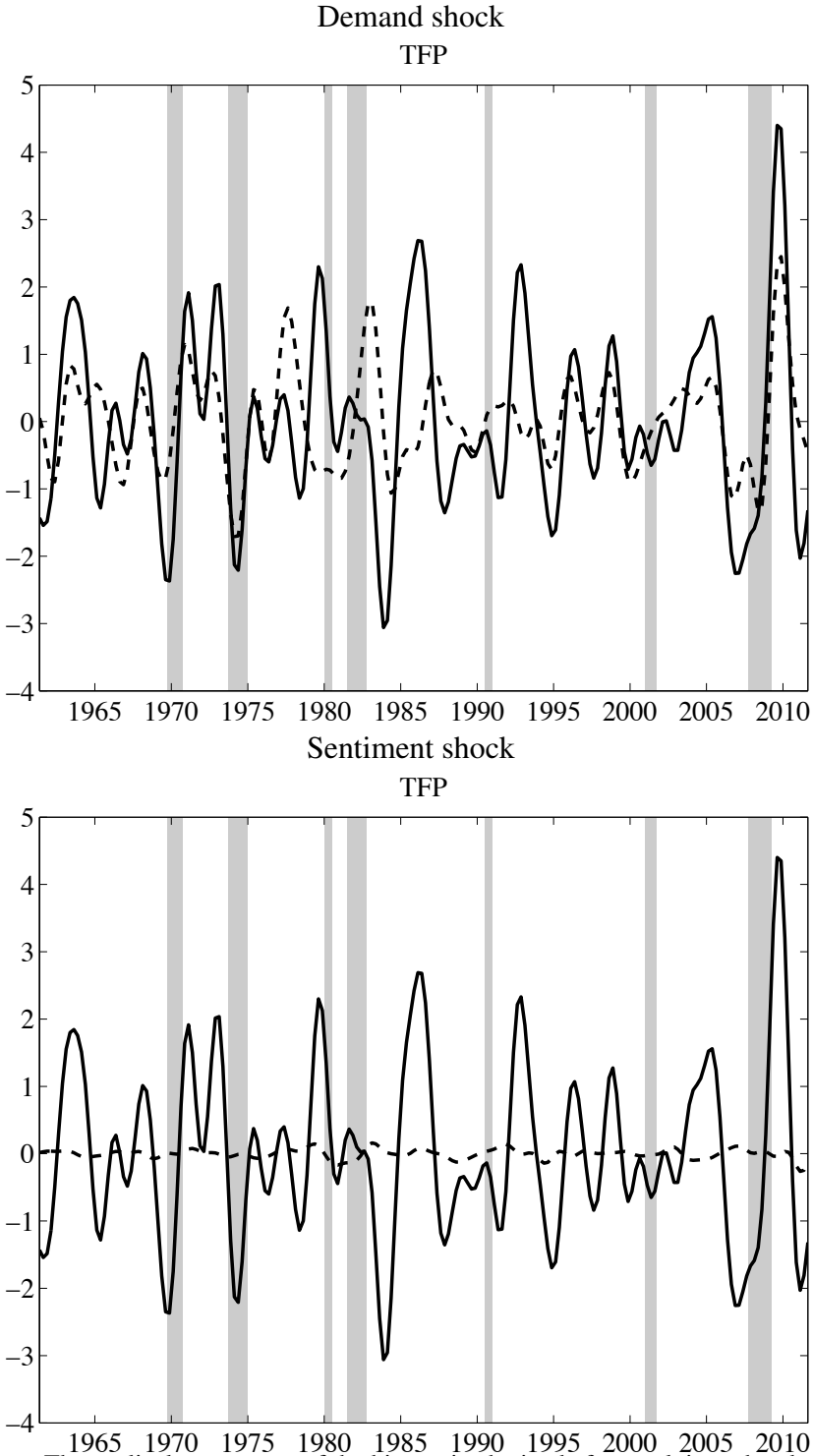
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita GDP, the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2011:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 33: History of TFP–Permanent Shocks (BS & GDP)



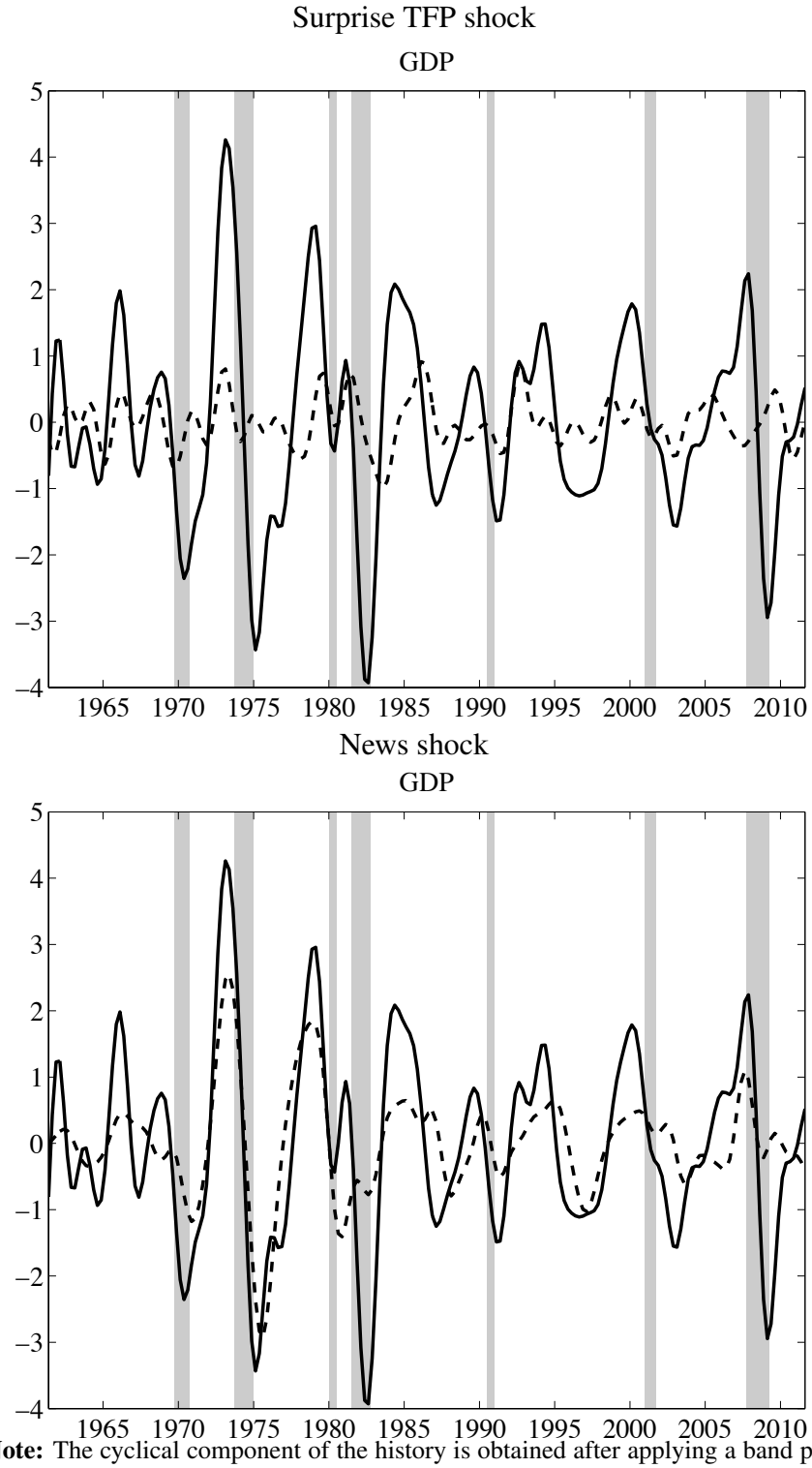
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 34: History of TFP–Transitory Shocks (BS & GDP)



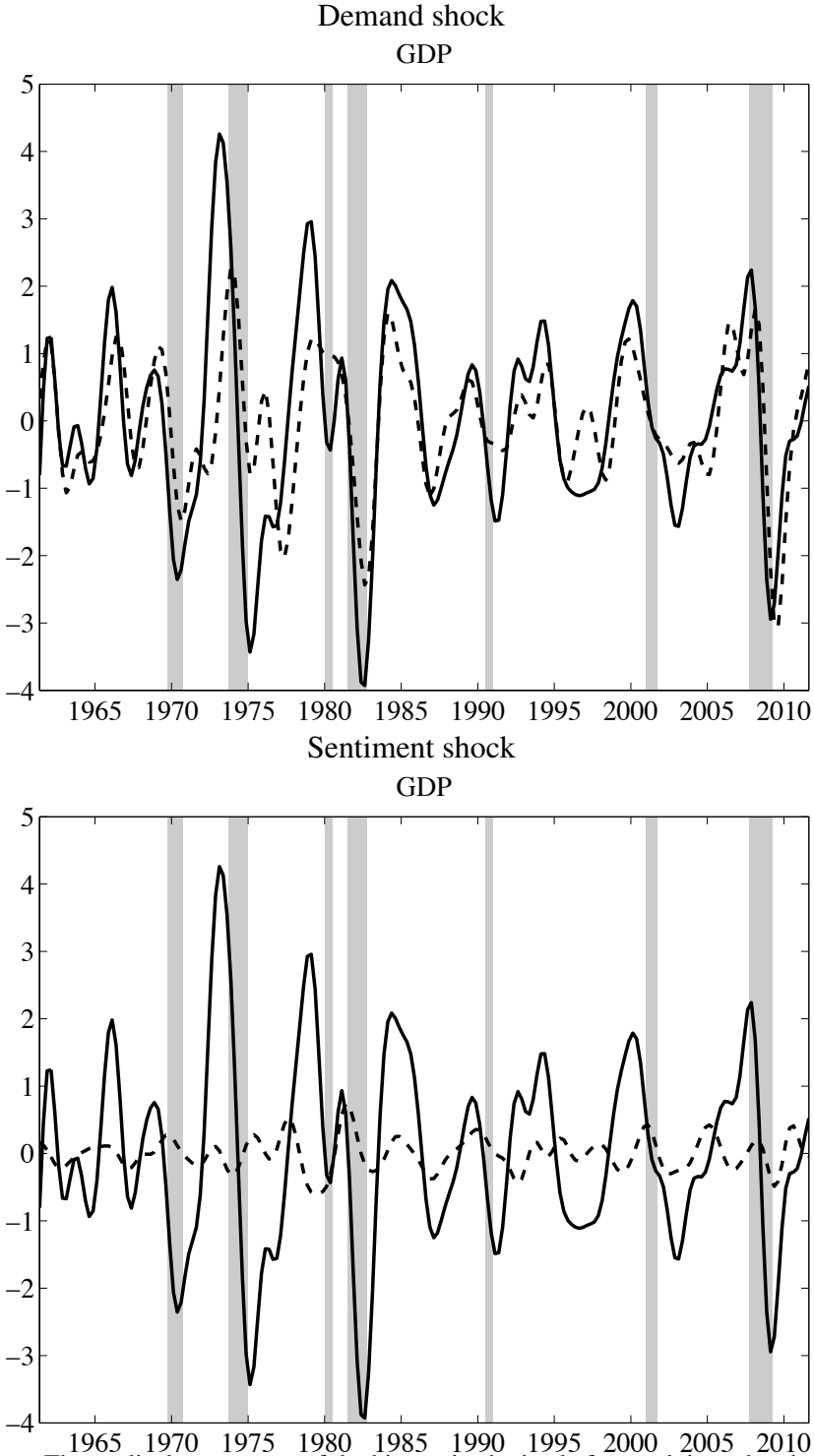
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 35: History of GDP–Permanent Shocks (BS & GDP)



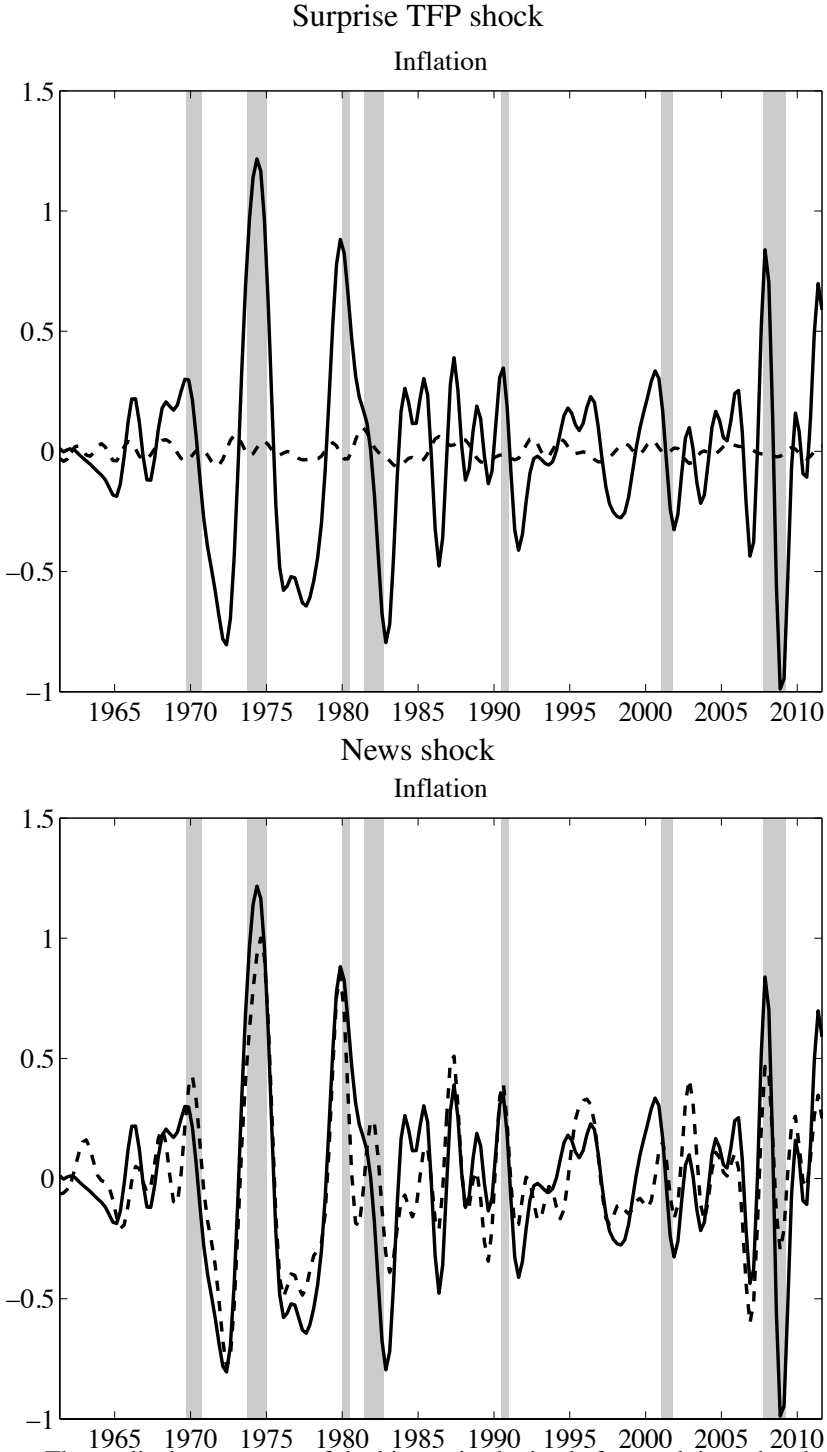
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 36: History of GDP–Transitory Shocks (BS & GDP)



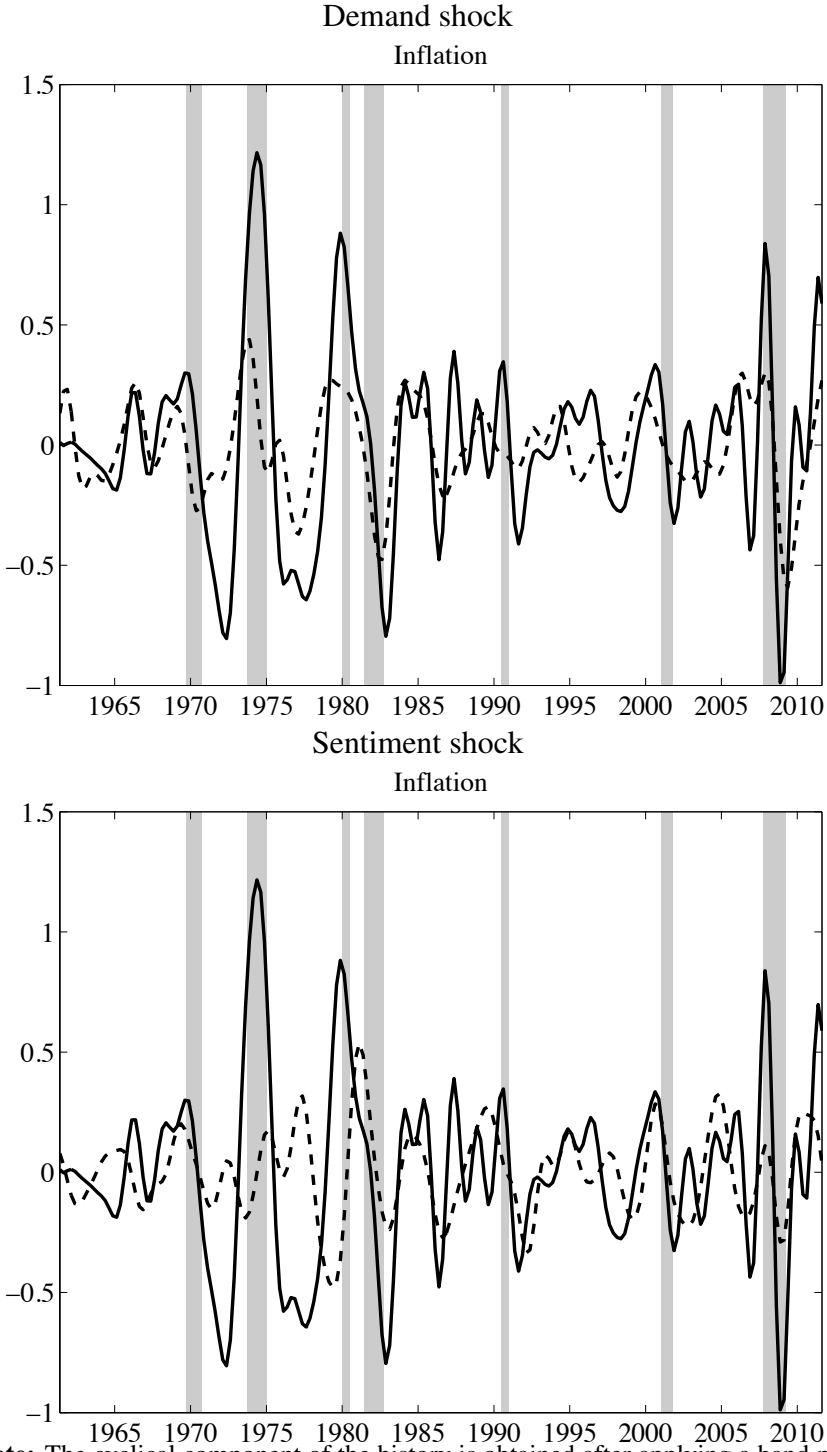
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 37: History of Inflation–Permanent Shocks (BS & GDP)



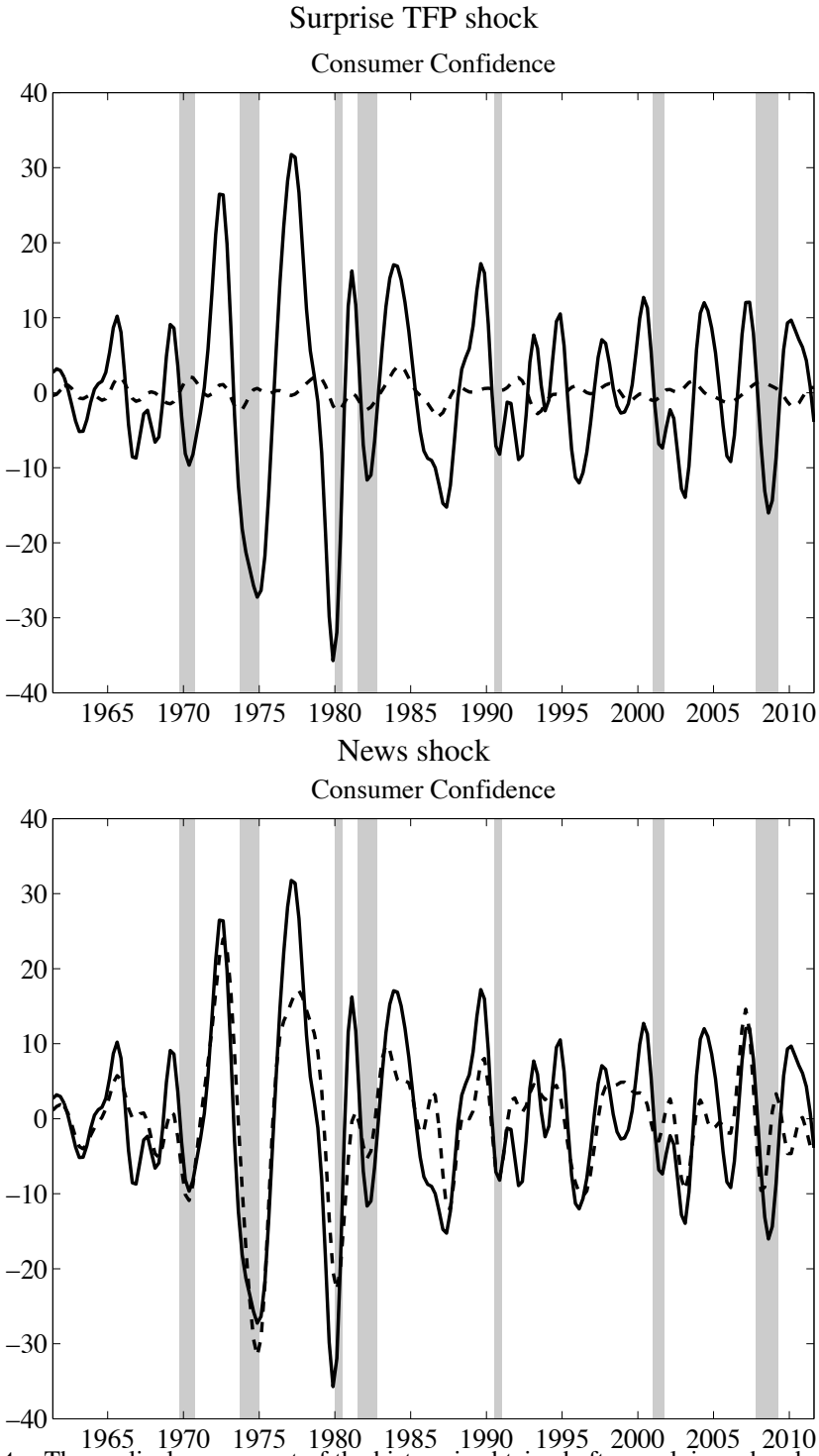
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 38: History of Inflation–Transitory Shocks (BS & GDP)



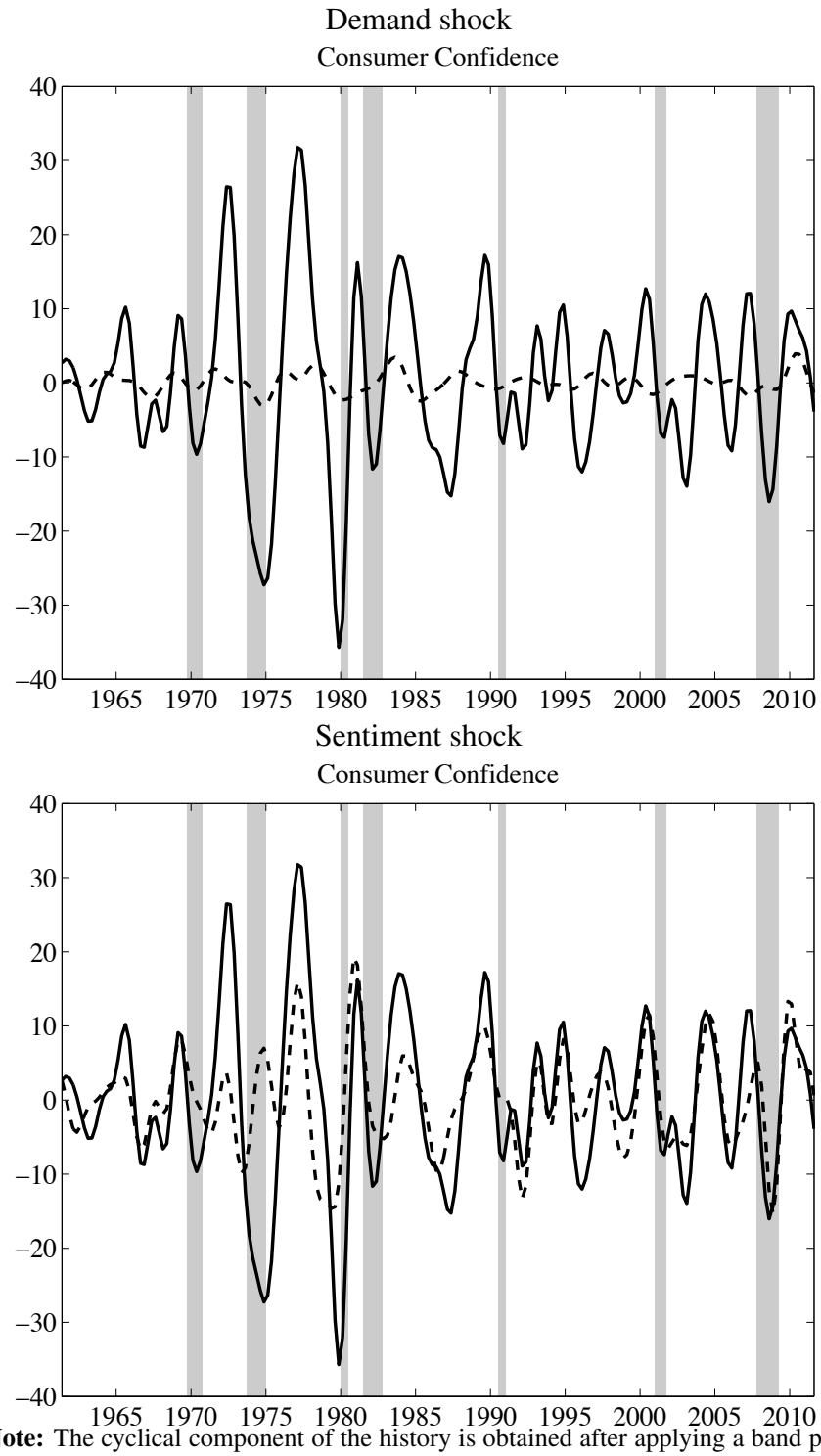
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 39: History of Consumer Confidence–Permanent Shocks (BS & GDP)



Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

Figure 40: History of Consumer Confidence–Transitory Shocks (BS & GDP)

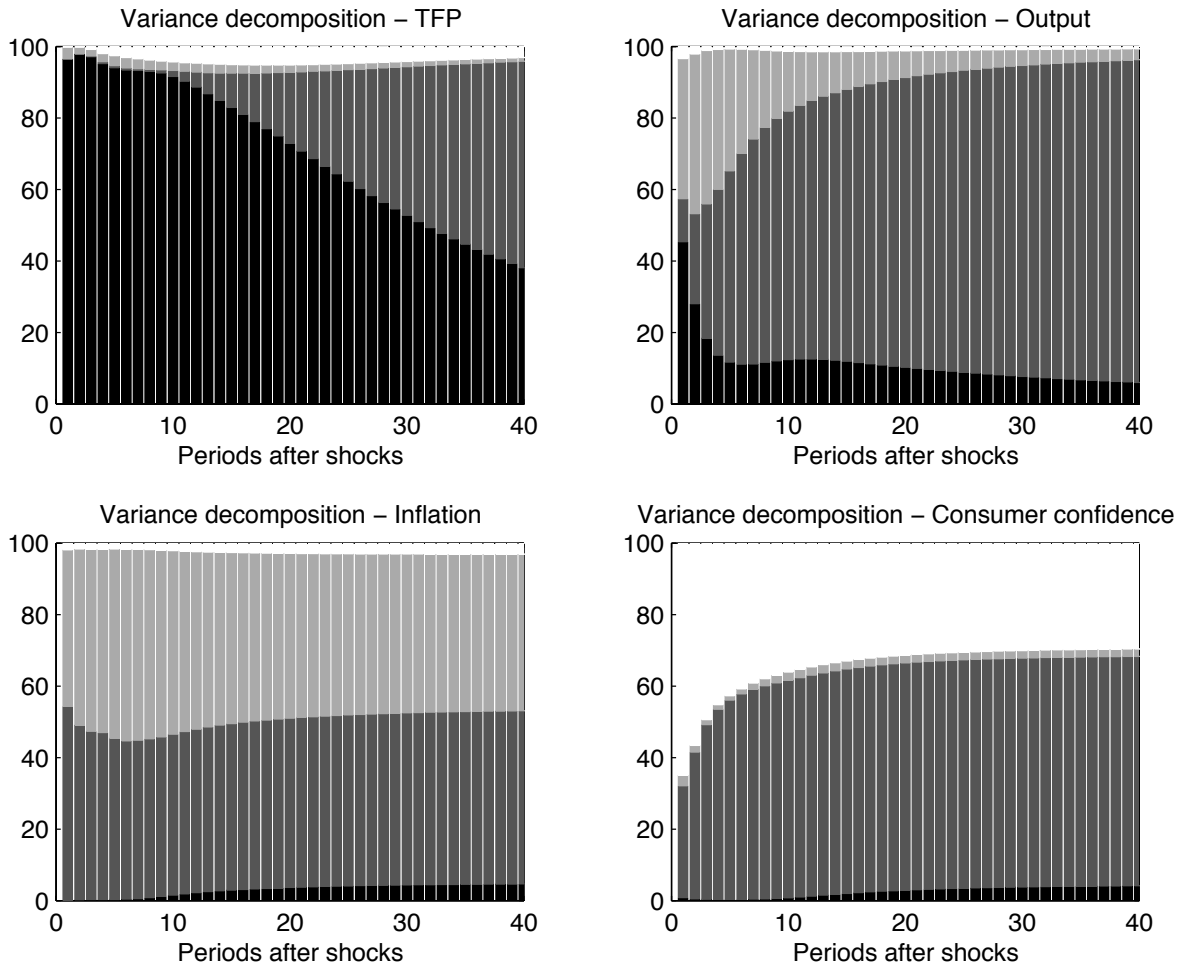


Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2011:4.

5 Non zero Restriction on Demand Shock

We have also relaxed the assumption that demand shocks cannot have an effect (on impact) on TFP. As emphasized in Ben Zeev and Pappa (2014), this restriction has strong implications for the quantitative assessment of the short–run propagation of unexpected fiscal shocks that are a part of our identified demand shock. Rather than imposing a zero restriction, we set a non zero value for the (1×3) entry in the initial matrix $\tilde{A}_0$ of our two–step approach. In practise, we select an initial positive value, such that the short–run response of output is similar to what obtained in Ben Zeev and Pappa (2014) when the TFP is allowed to respond to government spending shock. The demand shock has now an immediate effect on TFP but none of our previous results are affected. The news shock remains the main driver of GDP and inflation, and the sentiments shock explains a tiny share of their variance.

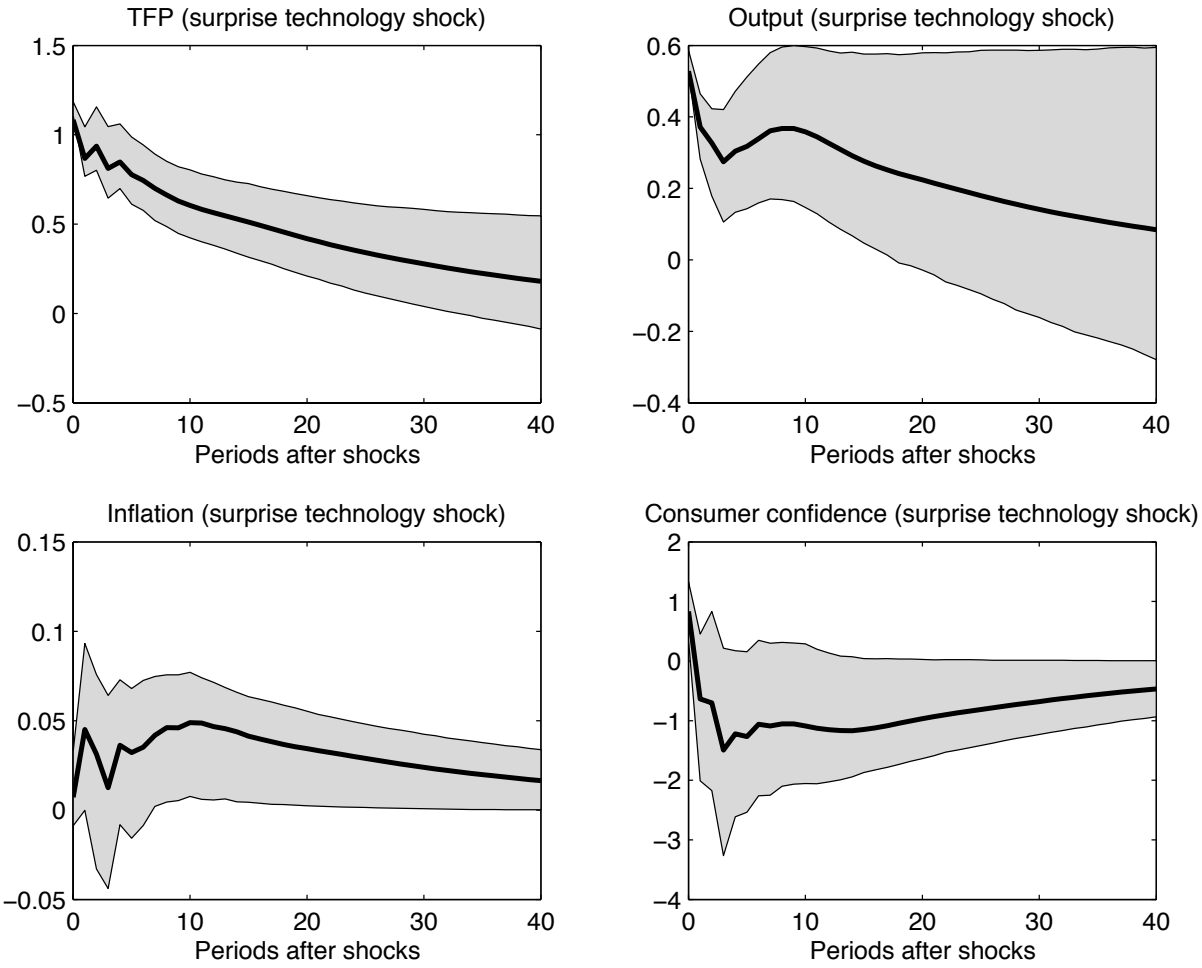
Figure 41: Non zero Restriction on Demand Shock – Variance decomposition



Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita GDP, the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2011:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. The white area corresponds to the share of variance explained by the sentiment shock, the light grey area to the demand shock, the dark grey area to the news shock on TFP and the dark area to the surprise shock on TFP.

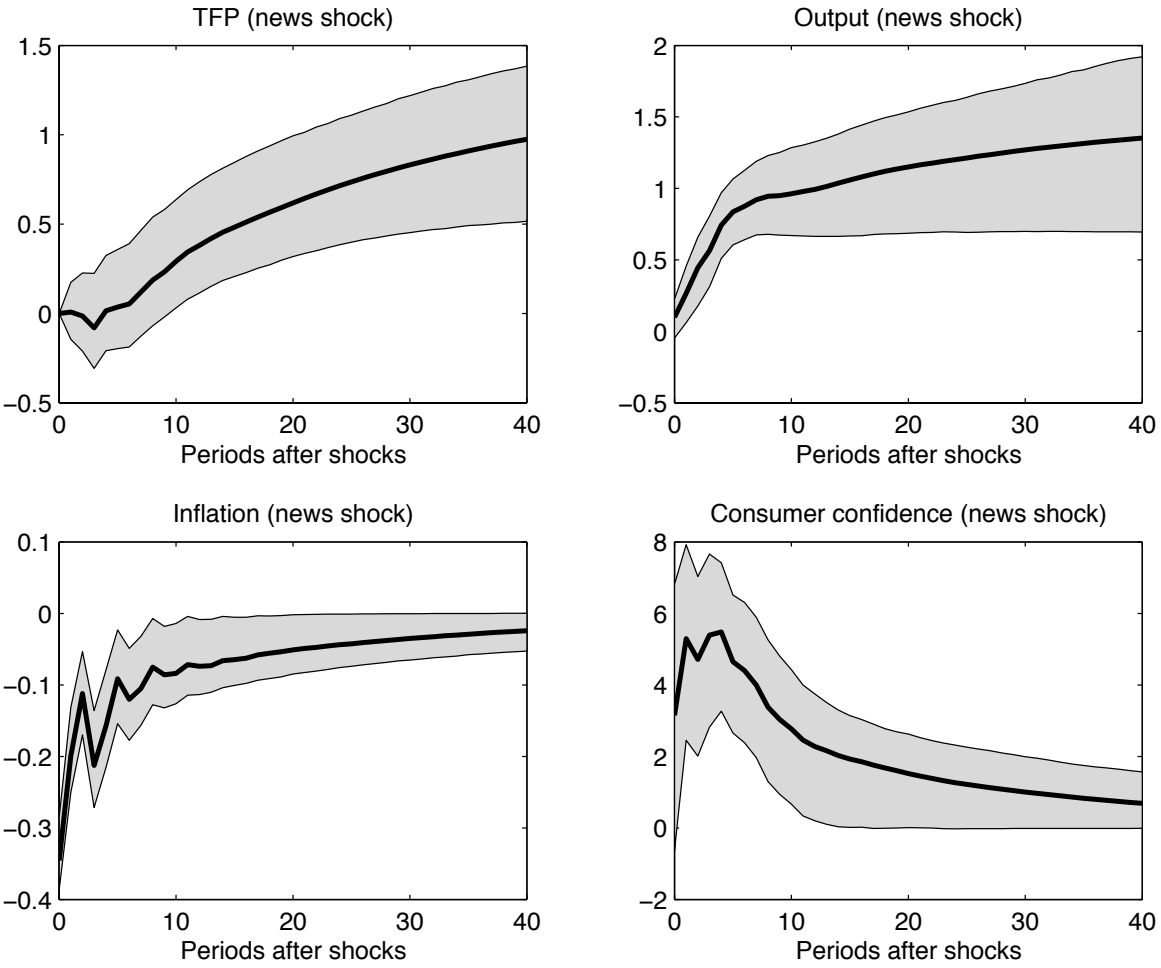
6 IRFs, Variance Decomposition and Histories: 1960–2006

Figure 42: IRFs to a surprise TFP shock (SVECM & 1960–2006)



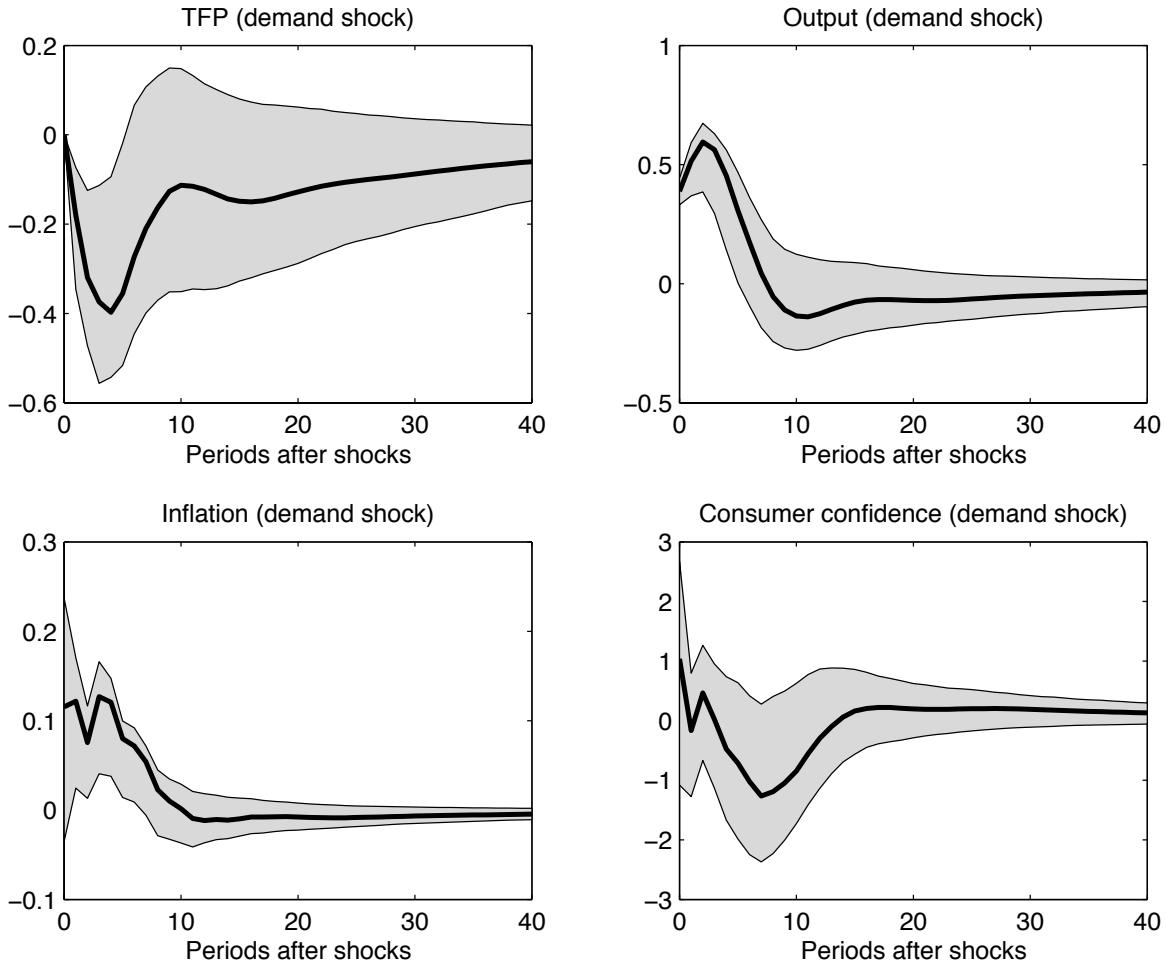
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita GDP, the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2006:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 43: IRFs to a news shock (SVECM & 1960–2006)



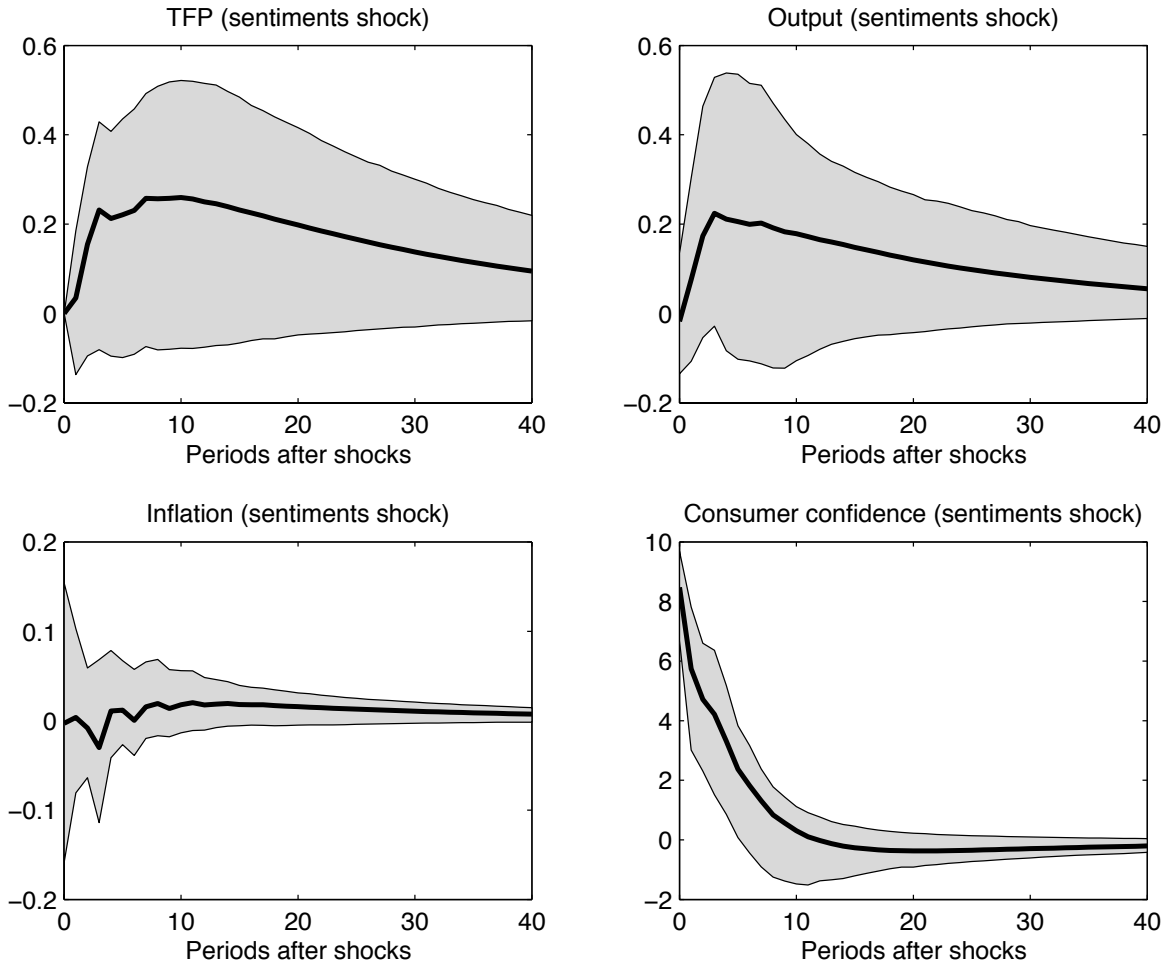
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita GDP, the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2006:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 44: IRFs to a demand shock (SVECM & 1960–2006)



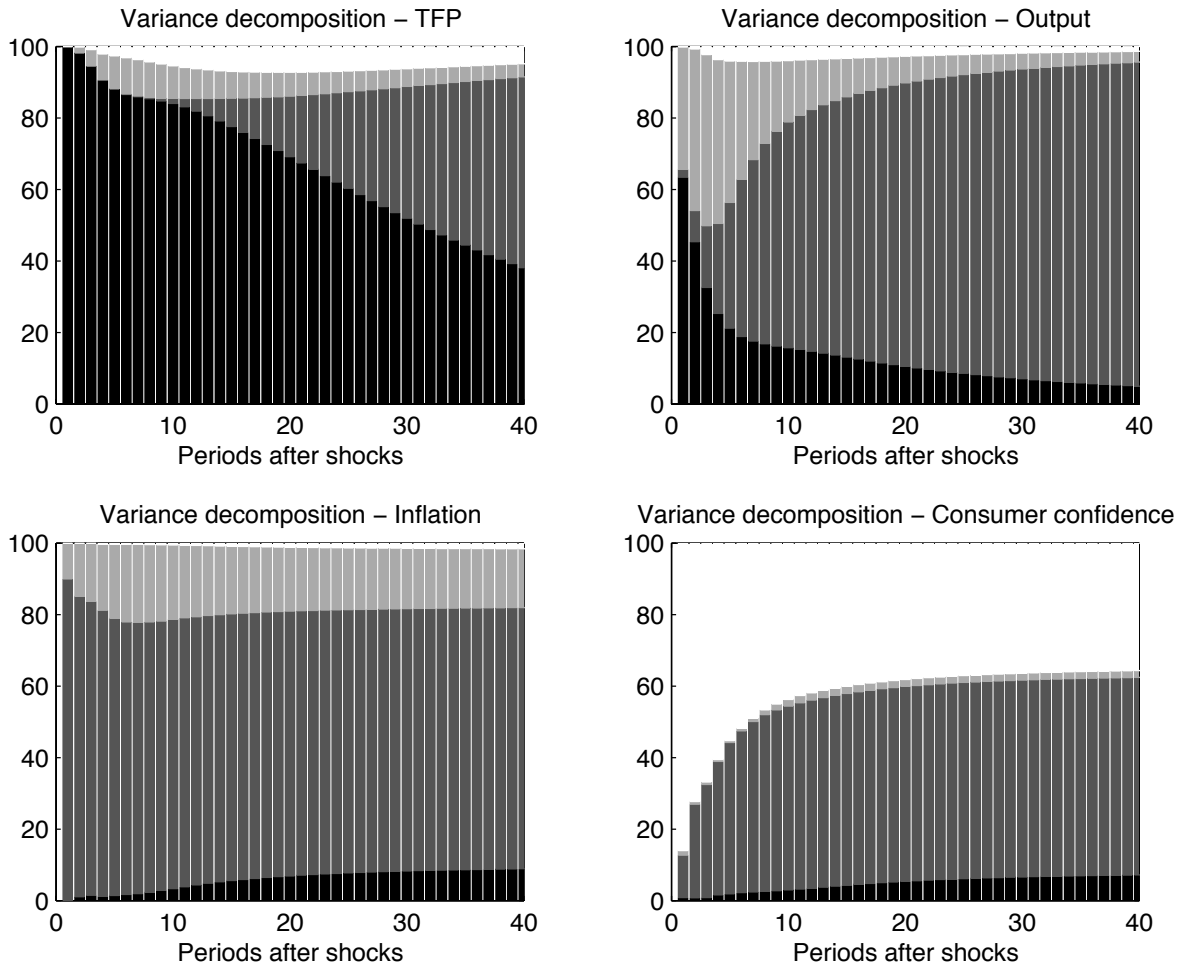
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita GDP, the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2006:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 45: IRFs to a sentiment shock (SVECM & 1960–2006)



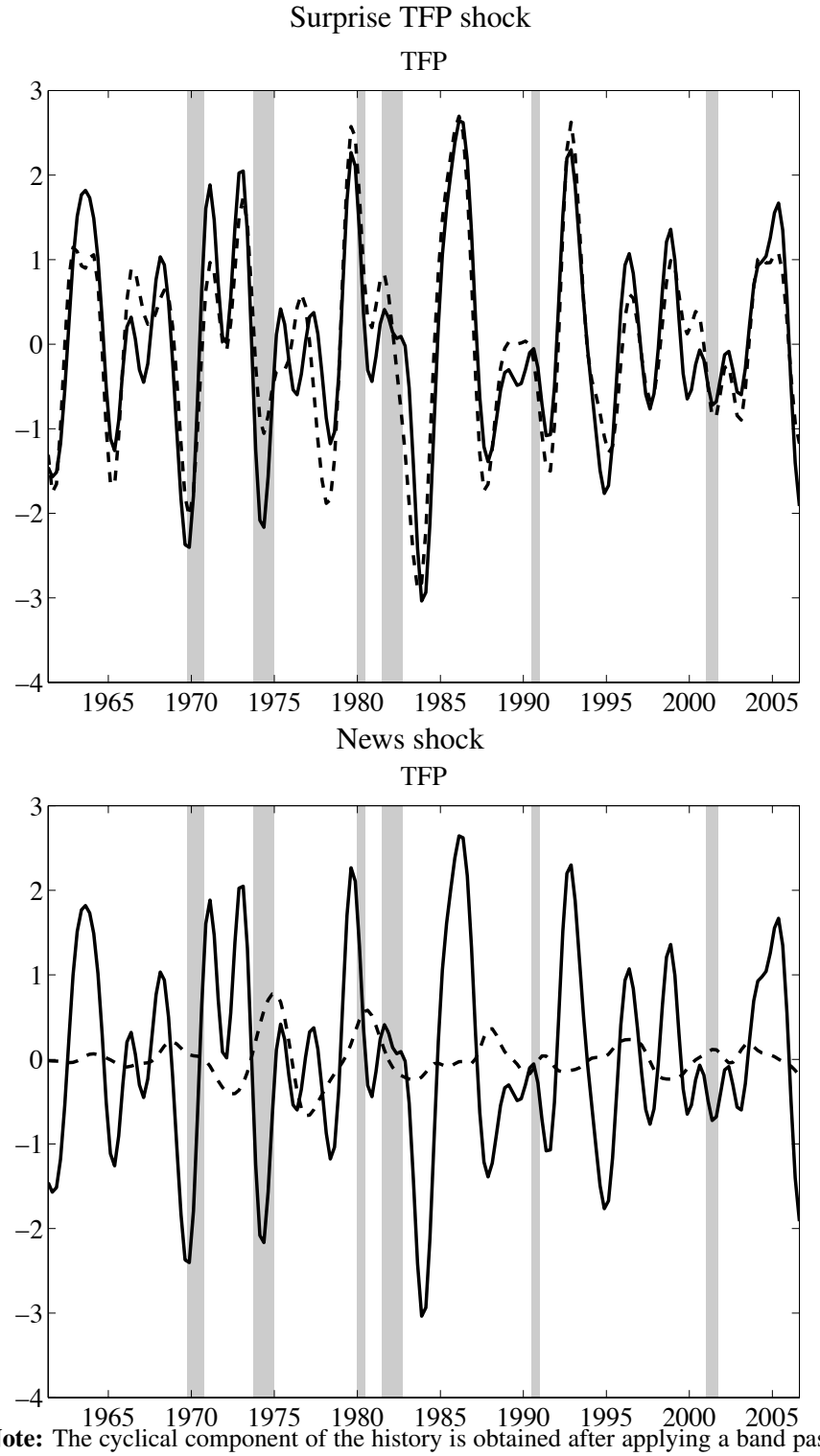
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita GDP, the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2006:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. 90% percent confidence interval obtained from a standard bootstrap technique with 2000 replications.

Figure 46: Variance decomposition (SVECM & 1960–2006)



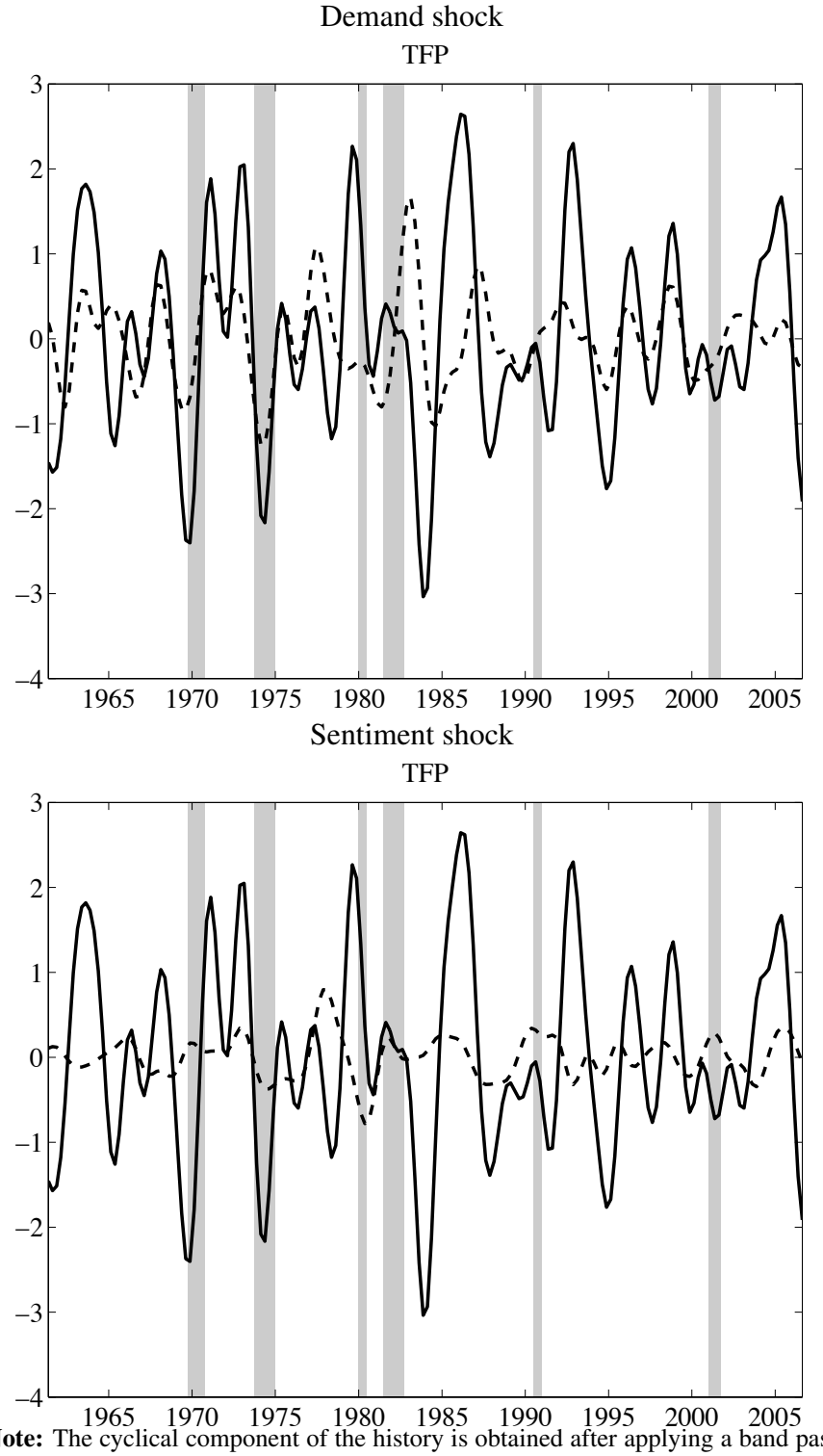
Note: The VECM includes the growth rate of adjusted TFP, the growth rate of real per capita GDP, the rate of inflation (CPI all) and the measure E5Y of consumer confidence. The sample period is 1960:1-2006:4. Three lags are included in the VECM. The selected horizon for IRFs is 40. The white area corresponds to the share of variance explained by the sentiment shock, the light grey area to the demand shock, the dark grey area to the news shock on TFP and the dark area to the surprise shock on TFP.

Figure 47: History of TFP–Permanent Shocks (SVECM & 1960–2006)



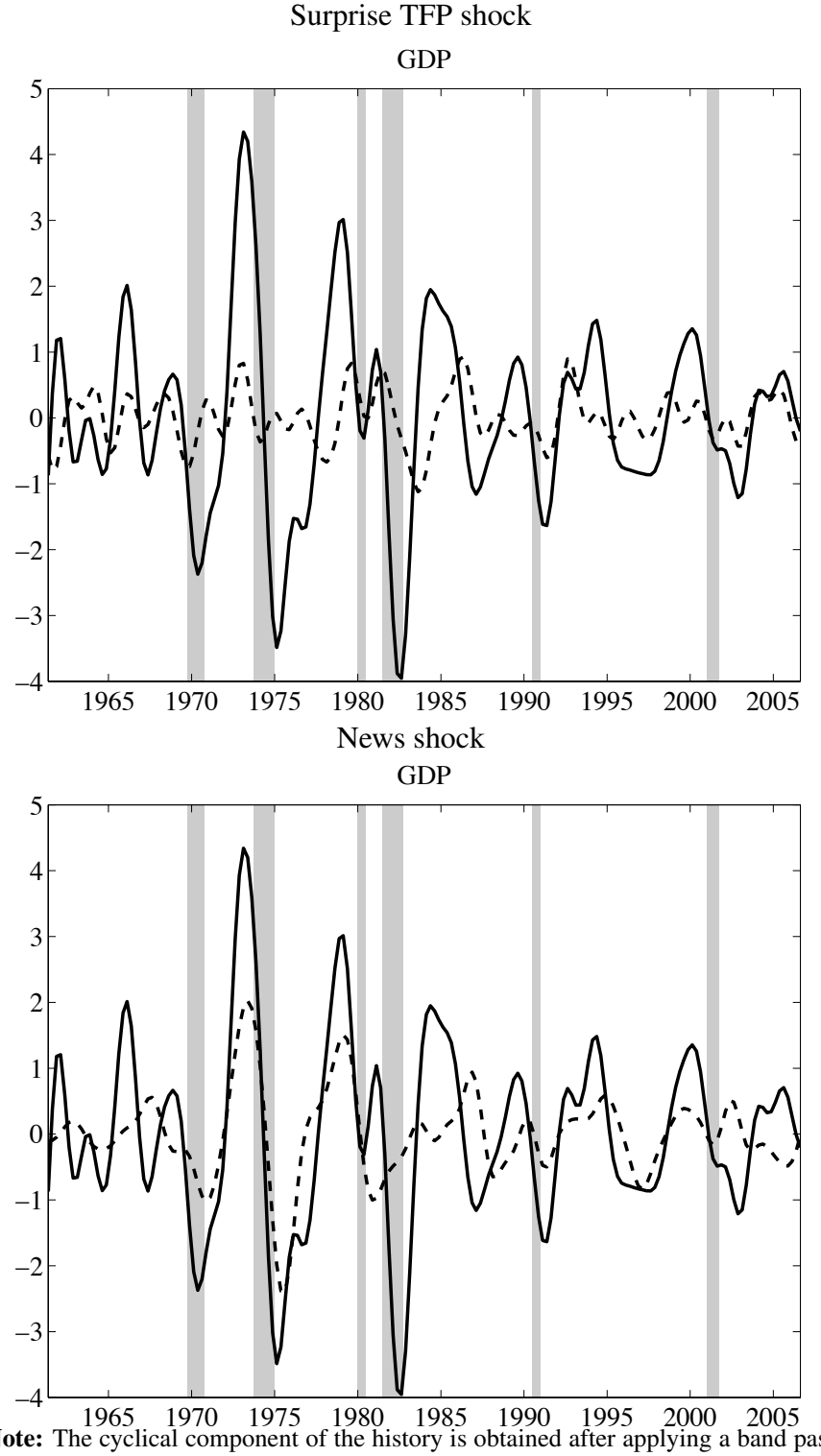
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2006:4.

Figure 48: History of TFP–Transitory Shocks (SVECM & 1960–2006)



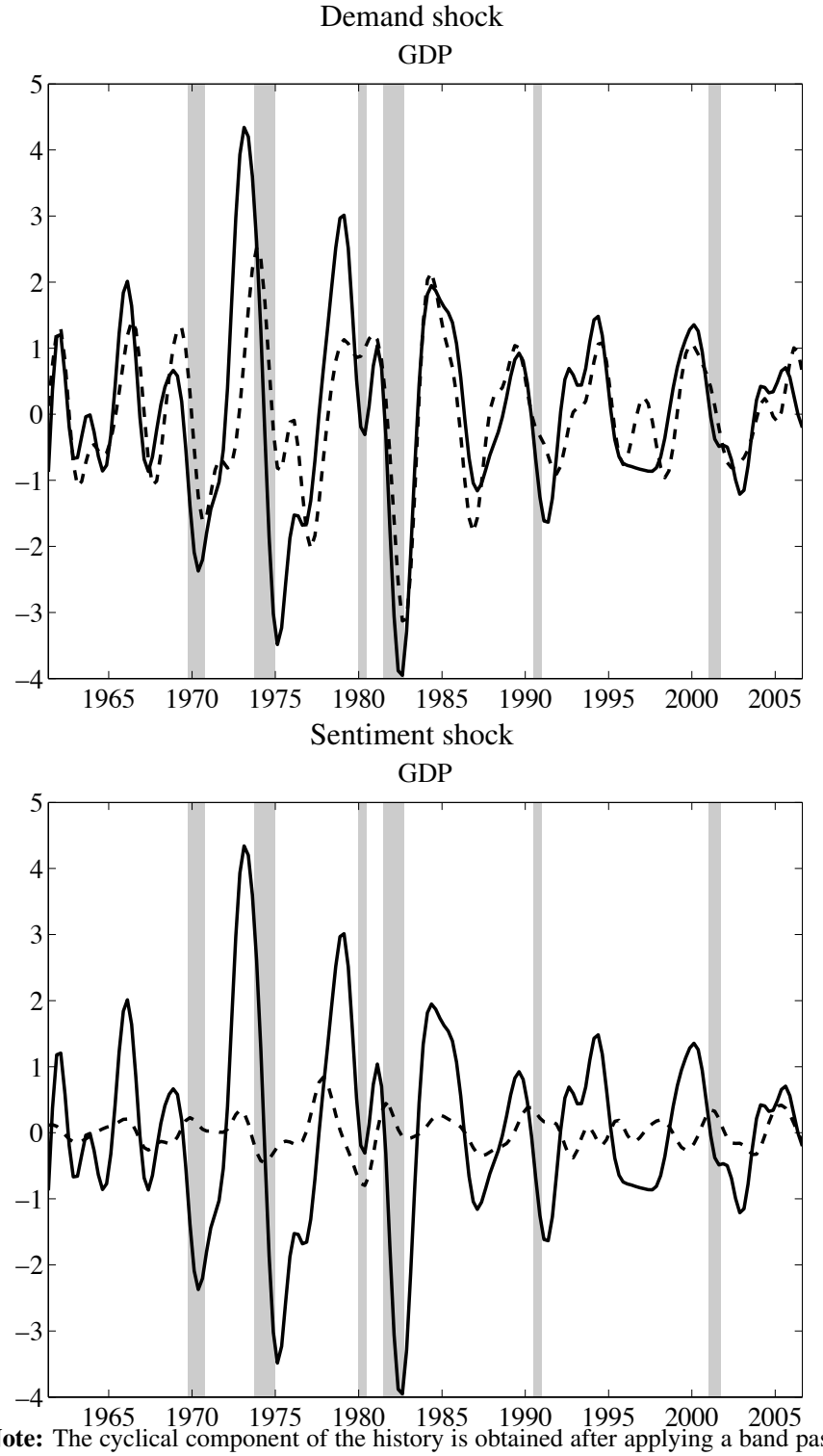
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2006:4.

Figure 49: History of GDP–Permanent Shocks (SVECM & 1960–2006)



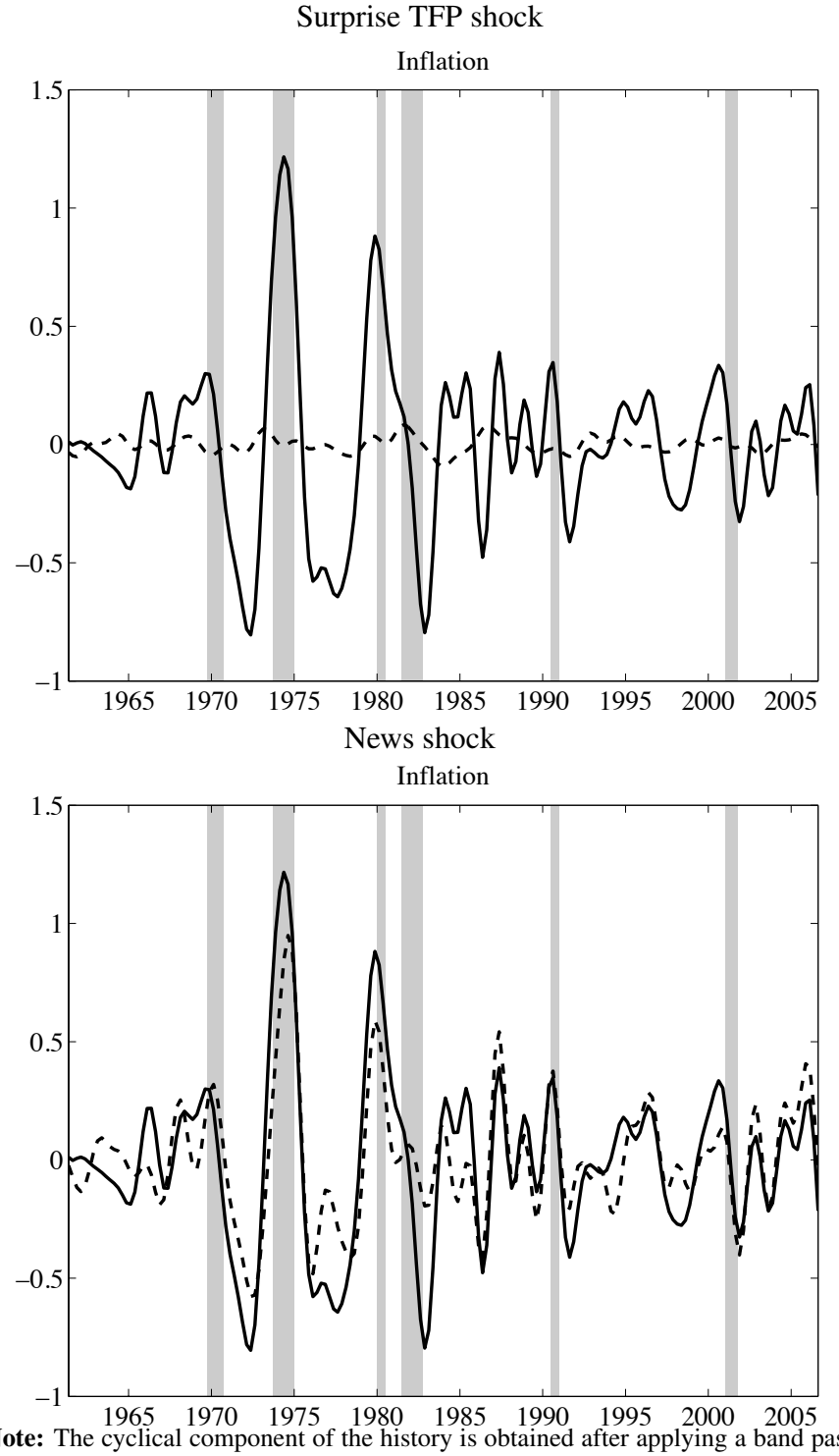
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2006:4.

Figure 50: History of GDP–Transitory Shocks (SVECM & 1960–2006)



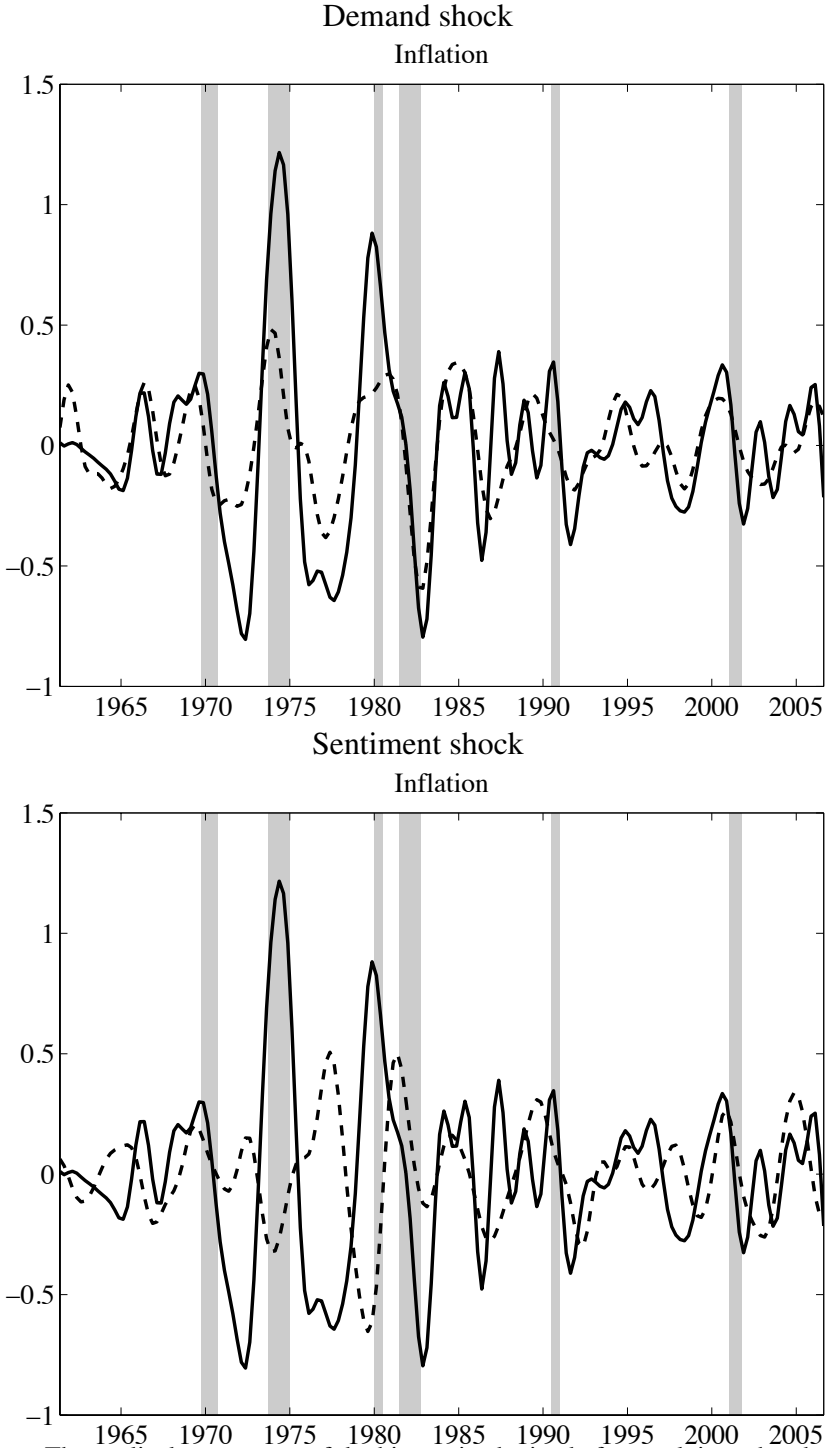
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2006:4.

Figure 51: History of Inflation–Permanent Shocks (SVECM & 1960–2006)



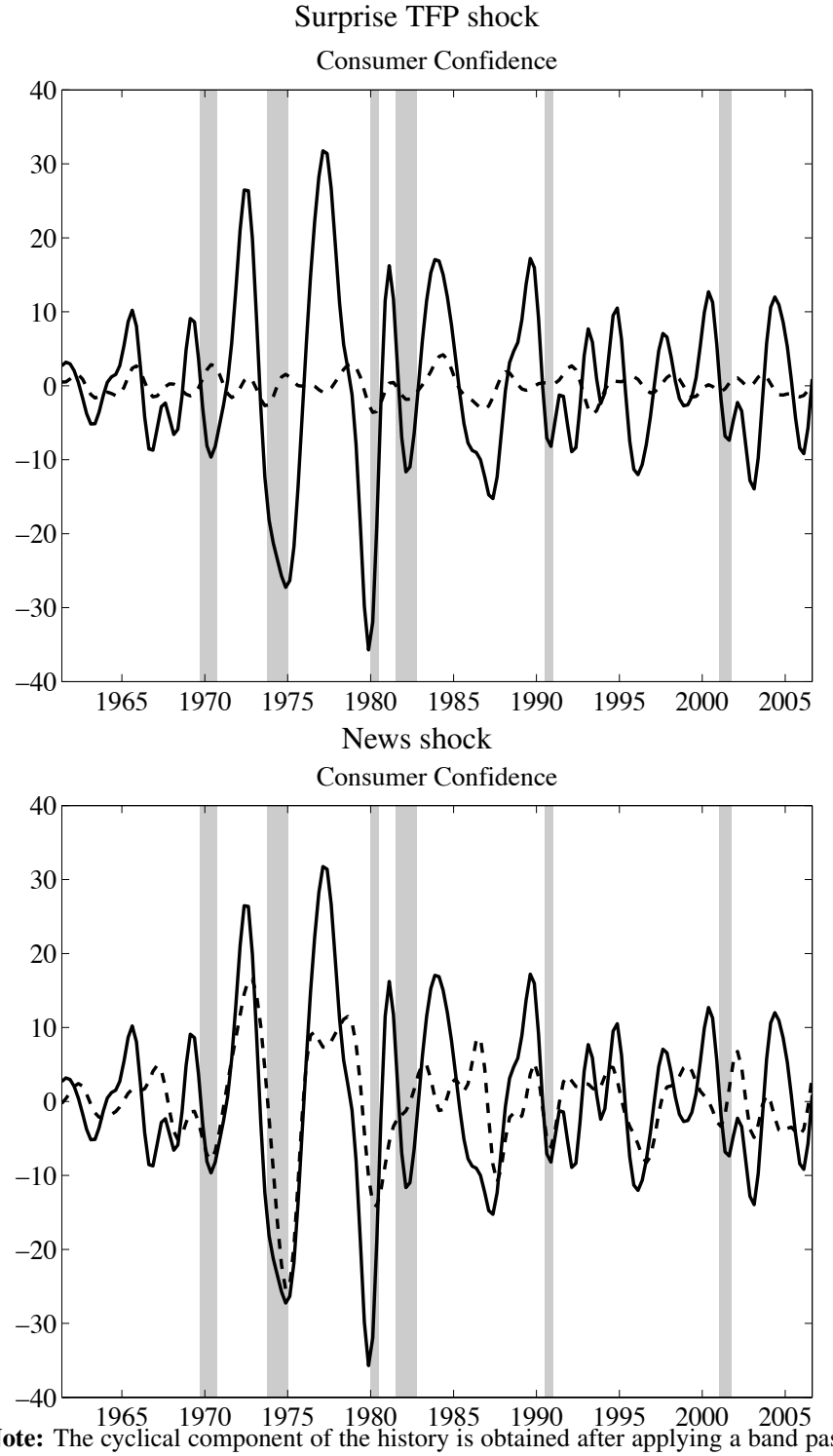
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2006:4.

Figure 52: History of Inflation–Transitory Shocks (SVECM & 1960–2006)



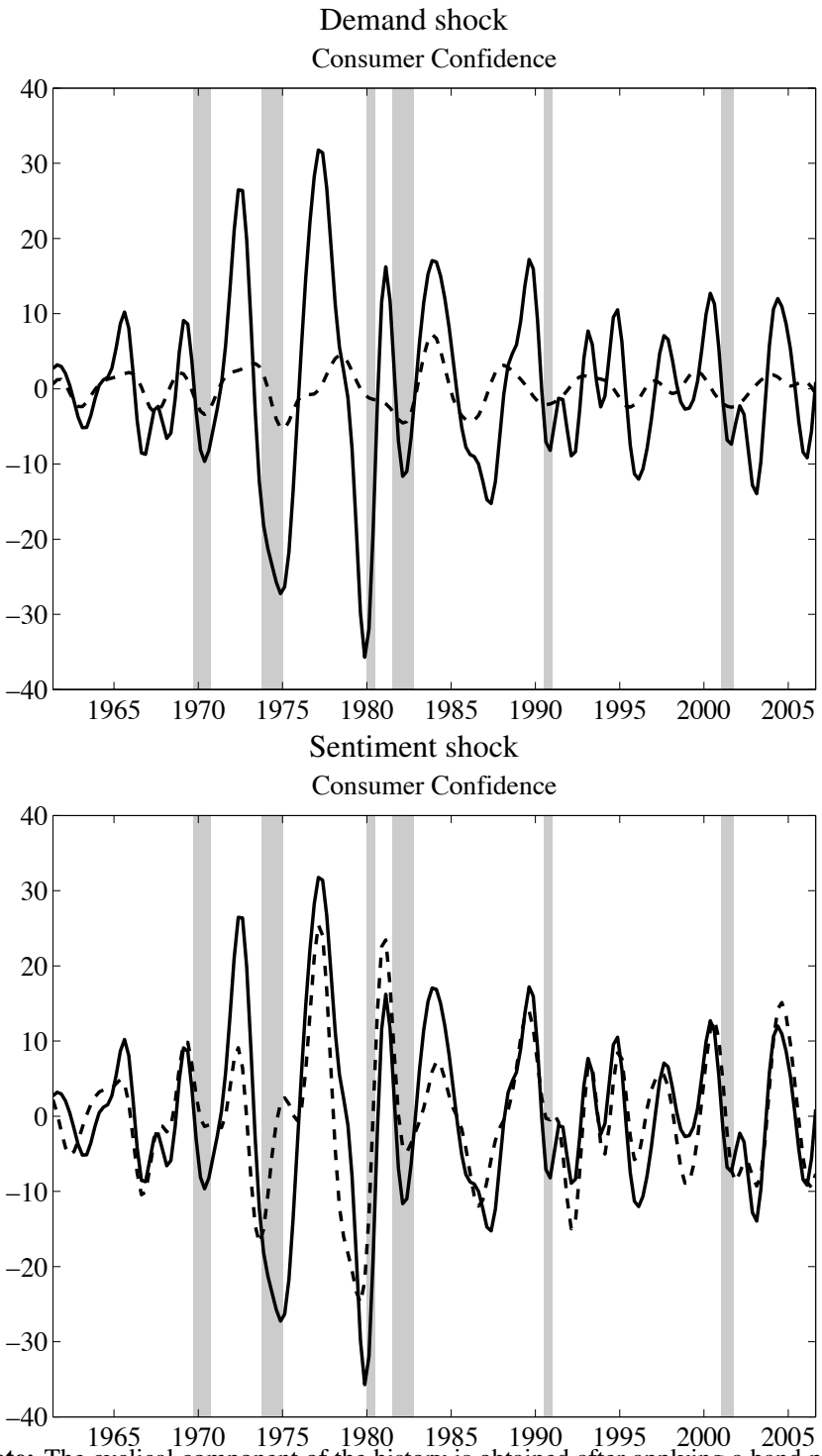
Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2006:4.

Figure 53: History of Consumer Confidence–Permanent Shocks (SVECM & 1960–2006)



Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2006:4.

Figure 54: History of Consumer Confidence–Transitory Shocks (SVECM & 1960–2006)



Note: The cyclical component of the history is obtained after applying a band pass filter with a component between 1.5 and 8 years. Each history is obtained from the identified structural shock in the SVECM. Grey areas represent the NBER recession dates. The sample period is 1960:1-2006:4.