

Supporting Information

A Tables Appendix

Table A.1

Unit root tests.

| Time Series | Levels | | First differences | |
|----------------------------------|-----------|-----------|-------------------|------------|
| | ADF (SIC) | PP | ADF (SIC) | PP |
| LNGDP_CH (trend & intercept) | -1.437 | -1.299 | -10.516*** | -10.433*** |
| LNGDP_CH_1 (trend & intercept) | -1.448 | -1.523 | -11.604*** | -12.746*** |
| LNGDP_CH_2 (trend & intercept) | -0.718 | -0.684 | -10.193*** | -10.070*** |
| LNGDP_CH_3 (trend & intercept) | -2.374 | -2.251 | -9.147*** | -9.435*** |
| LNGDP_TP (trend & intercept) | -2.253 | -1.716 | -4.120*** | -4.061** |
| VIX (intercept) | -3.615*** | -3.589*** | -8.278*** | -10.925*** |
| I_TP (intercept) | -1.531267 | -1.373 | -4.583*** | -4.540*** |
| BC (intercept) (1999:01-2014:04) | -3.801*** | -2.814* | -6.681*** | -6.681*** |
| CC (intercept) (2001:01-2014:04) | -0.496 | -1.146 | -11.295*** | -10.850*** |

Source: Own calculations.

Table A.2

Trace Test

| Trace Statistic (sample: 1996:01-2014:04; series: LNGDP_CH LNGDP_TP I_TP, based on a VAR(1).) | | | | |
|--|------------|-----------------|-------------------|-----------|
| r | Eigenvalue | Trace Statistic | 5% Critical Value | p-value** |
| 0 | 0.348 | 42.366 | 42.915 | 0.057 |
| 1 | 0.102 | 9.802 | 25.872 | 0.933 |
| 2 | 0.021 | 1.619 | 12.518 | 0.987 |

Trace test indicates 0 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

** MacKinnon-Haug-Michelis (1999) p-values

Table A.3

Diagnostic tests for the trade channel for China.

| Variables | DLNGDP_CH DLNGDP_TP | | |
|---|---------------------|----------|------------------------|
| Lags | 4 | | |
| Dummies | None | | |
| Residual autocorrelation test: (H0: No serial autocorrelation) | Lags | p-value | |
| | 1 | 0.173 | |
| | 2 | 0.596 | |
| | 3 | 0.060 | |
| | 4 | 0.841 | |
| Heteroscedasticity test (H0: No cross terms) | p-value 0.082 | | |
| Univariate normality | Skewness | Kurtosis | Normality (p-value) |
| DLNGDP_CH | -0.193 | 3.826 | 0.268 |
| DLNGDP_TP | -0.547 | 5.857 | 0.000 |

Table A.4

Granger causality tests for the trade channel for China.

Null: DLNGDP_TP does not Granger cause DLNGDP_CH

Lags 96Q1–14Q^a

| | |
|---|----------|
| 1 | 0.616 |
| 2 | 0.056* |
| 3 | 0.115 |
| 4 | 0.008*** |

^aModels include no dummies;

*, **, *** indicate rejection of the null at the 10%, 5%, and 1% levels

Table A.5

Variance decompositions for the trade channel for China.

| Quarters | Decomposition of | DLNGDP_CH | DLNGDP_TP |
|----------|------------------|--------------------|-------------------|
| 1 | DLNGDP_CH | 100.000 (0.000) | 0.000 (0.000) |
| | DLNGDP_TP | 13.952 (7.107) | 86.048 (7.107) |
| 2 | DLNGDP_CH | 90.160 (6.588) | 9.840 (6.588) |
| | DLNGDP_TP | 11.311 (7.008) | 88.689 (7.008) |
| 4 | DLNGDP_CH | 84.927 (7.730) | 15.073 (7.730) |
| | DLNGDP_TP | 9.924 (7.015) | 90.076 (7.015) |
| 8 | DLNGDP_CH | 85.786 (7.758) | 14.214 (7.758) |
| | DLNGDP_TP | 10.177 (7.919) | 89.823 (7.919) |
| 12 | DLNGDP_CH | 85.911 (7.977) | 14.089 (7.977) |
| | DLNGDP_TP | 10.283 (8.531) | 89.717 (8.531) |

Table A.6

Diagnostic tests for the trade channel for China's subsectors.

| Variables | DLNGDP_CH_1 DLNGDP_CH_3 DLNGDP_CH_2 DLNGDP_TP | |
|--|--|---------|
| Lags | 4 | |
| Dummies | None | |
| Residual autocorrelation test (H0: No serial autocorrelation) | Lags | p-value |
| | 1 | 0.146 |
| | 2 | 0.619 |
| | 3 | 0.671 |
| | 4 | 0.887 |
| Heteroscedasticity test (H0: No cross terms) | p-value 0.513 | |

| Univariate normality | | | |
|----------------------|----------|----------|------------------------|
| | Skewness | Kurtosis | Normality (p-value) |
| DLNGDP_CH_1 | 0.184 | 4.698 | 0.008 |
| DLNGDP_CH_3 | 0.100 | 3.515 | 0.617 |
| DLNGDP_CH_2 | -0.092 | 2.694 | 0.817 |
| DLNGDP_TP | -0.451 | 4.020 | 0.053 |

Table A.7

Granger causality tests for the trade channel for China's subsectors.

| Null: DLNGDP_TP does not Granger-cause DLNGDP_CH_1 | | Null: DLNGDP_TP does not Granger-cause DLNGDP_CH_2 | | Null: DLNGDP_TP does not Granger-cause DLNGDP_CH_3 | |
|--|------------------------|--|------------------------|--|------------------------|
| Lags | 96Q1–14Q4 ^a | 96Q1–14Q4 ^a | 96Q1–14Q4 ^a | 96Q1–14Q4 ^a | 96Q1–14Q4 ^a |
| 1 | 0.551 | 0.184 | 0.633 | 0.633 | 0.633 |
| 2 | 0.754 | 0.117 | 0.455 | 0.455 | 0.455 |
| 3 | 0.806 | 0.229 | 0.412 | 0.412 | 0.412 |
| 4 | 0.884 | 0.016** | 0.372 | 0.372 | 0.372 |

^a Models include no dummies;

*, **, *** indicate rejection of the null at the 10%, 5%, and 1% levels

Table A.8

Variance decompositions for the trade channel for China's subsectors.

| Quarters | Decomposition of | DLNGDP_CH_1 | DLNGDP_CH_2 | DLNGDP_CH_3 | DLNGDP_TP |
|----------|------------------|--------------------|-------------------|-------------------|-------------------|
| 1 | DLNGDP_CH_1 | 100.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) |
| | DLNGDP_CH_2 | 0.177 (1.951) | 99.441 (3.103) | 0.382 (2.509) | 0.000 (0.000) |
| | DLNGDP_CH_3 | 4.158 (4.810) | 0.000 (0.000) | 95.842 (4.810) | 0.000 (0.000) |
| | DLNGDP_TP | 1.408 (3.070) | 17.373 (7.298) | 4.334 (4.590) | 76.885 (8.266) |
| 2 | DLNGDP_CH_1 | 98.937 (3.653) | 0.000 (0.000) | 0.079 (1.967) | 0.000 (0.000) |
| | DLNGDP_CH_2 | 0.762 (3.149) | 88.899 (7.497) | 0.519 (3.156) | 9.820 (6.880) |
| | DLNGDP_CH_3 | 4.100 (4.865) | 0.843 (2.502) | 93.333 (6.170) | 1.723 (3.466) |
| | DLNGDP_TP | 1.209 (3.549) | 17.664 (8.133) | 2.825 (3.898) | 78.302 (8.992) |
| 4 | DLNGDP_CH_1 | 96.096 (6.391) | 1.450 (4.002) | 1.988 (3.967) | 0.466 (3.744) |
| | DLNGDP_CH_2 | 5.720 (6.112) | 79.712 (8.026) | 2.045 (4.319) | 12.523 (6.607) |
| | DLNGDP_CH_3 | 9.306 (5.963) | 0.731 (2.931) | 83.871 (7.575) | 6.092 (5.571) |
| | DLNGDP_TP | 3.758 (5.726) | 15.544 (7.944) | 2.678 (4.667) | 78.020 (9.828) |
| 8 | DLNGDP_CH_1 | 93.404 (8.111) | 1.774 (5.009) | 3.089 (5.113) | 1.733 (4.577) |
| | DLNGDP_CH_2 | 8.199 | 78.035 | 1.934905 | 11.831 |

| | | | | | |
|----|-------------|---------|---------|---------|----------|
| | | (7.562) | (9.039) | (4.567) | (6.343) |
| | DLNGDP_CH_3 | 10.793 | 2.832 | 78.932 | 7.443 |
| | | (6.523) | (4.616) | (8.765) | (5.788) |
| | DLNGDP_TP | 9.177 | 14.850 | 3.442 | 72.531 |
| | | (8.520) | (7.918) | (5.080) | (11.014) |
| 12 | DLNGDP_CH_1 | 93.044 | 1.973 | 3.186 | 1.797 |
| | | (9.180) | (5.829) | (5.614) | (4.987) |
| | DLNGDP_CH_2 | 8.508 | 77.848 | 1.960 | 11.684 |
| | | (8.375) | (9.918) | (4.919) | (6.502) |
| | DLNGDP_CH_3 | 10.970 | 2.979 | 78.461 | 7.589 |
| | | (6.917) | (5.467) | (9.495) | (5.861) |
| | DLNGDP_TP | 9.135 | 15.017 | 3.590 | 72.258 |
| | | (8.611) | (8.488) | (5.261) | (11.403) |

Table A.9

Diagnostic tests for the financial channel (VIX) for China.

| Variables | DLNGDP_CH VIX | | |
|--|---------------------------|----------|------------------------|
| Lags | 2 | | |
| Dummies | 2002:03, 2008:04, 2011:03 | | |
| Residual autocorrelation test (H0: No serial autocorrelation) | Lags | p-value | |
| | 1 | 0.958 | |
| | 2 | 0.025 | |
| Heteroscedasticity test (H0: No cross terms) | p-value | | |
| | 0.237 | | |
| Univariate normality | Skewness | Kurtosis | Normality (p-value) |
| DLNGDP_CH | 0.166 | 3.381 | 0.667 |
| DLNGDP_TP | 0.602 | 3.864 | 0.031 |

Table A.10

Granger causality tests for the financial channel (VIX) for China.

Null: VIX does not Granger cause DLNGDP_CH

Lags 96Q1–14Q4^a

| | |
|---|---------|
| 1 | 0.072* |
| 2 | 0.042** |
| 3 | 0.100* |
| 4 | 0.075* |

^a Models include dummies:dum0203, dum0804, dum1103;

*, **, *** indicate rejection of the null at the 10%, 5%, and 1% levels

Table A.11

Variance decompositions for the financial channel (VIX) for China.

| Quarters | Decomposition of | DLNGDP_CH | VIX |
|----------|------------------|-----------|---------|
| 1 | DLNGDP_CH | 100.000 | 0.000 |
| | | (0.000) | (0.000) |
| | VIX | 0.227 | 99.773 |
| | | (2.102) | (2.102) |
| 2 | DLNGDP_CH | 97.329 | 2.671 |
| | | (2.224) | (2.224) |
| | VIX | 0.673 | 99.327 |
| | | (3.022) | (3.022) |
| 4 | DLNGDP_CH | 97.170 | 2.830 |
| | | (2.426) | (2.426) |
| | VIX | 0.613 | 99.387 |

| | | | |
|----|-----------|---------|---------|
| | | (3.934) | (3.934) |
| 8 | DLNGDP_CH | 97.161 | 2.839 |
| | | (2.474) | (2.474) |
| | VIX | 0.604 | 99.396 |
| | | (4.225) | (4.225) |
| 12 | DLNGDP_CH | 97.161 | 2.839 |
| | | (2.477) | (2.477) |
| | VIX | 0.604 | 99.396 |
| | | (4.242) | (4.242) |

Table A.12

Diagnostic tests for the financial channel (VIX) for China's subsectors.

| | | | |
|--|--|----------|------------------------|
| Variables | DLNGDP_CH_1 DLNGDP_CH_3 DLNGDP_CH_2 VIX | | |
| Lags | 2 | | |
| Dummies | 2002:03, 2008:04, 2011:03 | | |
| Residual autocorrelation test (H0: No serial autocorrelation) | Lags | p-value | |
| | 1 | 0.694 | |
| | 2 | 0.623 | |
| Heteroscedasticity test (H0: No cross terms) | p-value | | |
| | 0.748 | | |
| Univariate normality | Skewness | Kurtosis | Normality (p-value) |
| DLNGDP_CH_1 | 0.297 | 5.201 | 0.000 |
| DLNGDP_CH_3 | 0.058 | 3.522 | 0.636 |
| DLNGDP_CH_2 | 0.507 | 3.339 | 0.163 |
| VIX | 0.203 | 3.671 | 0.378 |

Table A.13

Granger causality tests for the financial channel (VIX) for China's subsectors.

| Null: VIX does not Granger-cause | DLNGDP_CH_1 | Null: VIX does not Granger-cause | DLNGDP_CH_2 | Null: VIX does not Granger-cause | DLNGDP_CH_3 |
|----------------------------------|-----------------------|----------------------------------|-------------|----------------------------------|-------------|
| Lags | 96Q1–14Q ^a | 96Q1–14Q4 | 96Q1–14Q4 | 96Q1–14Q4 | 96Q1–14Q4 |
| 1 | 0.979 | 0.088* | 0.256 | 0.096* | |
| 2 | 0.841 | 0.004*** | 0.239 | | |
| 3 | 0.406 | 0.002*** | 0.278 | | |
| 4 | 0.196 | 0.000*** | | | |

^a Models include dummies for 2002:03, 2008:04, 2011:03;

*, **, *** indicate rejection of the null at 10%, 5%, and 1% levels

Table A.14

Variance decompositions for the financial channel (VIX) for China's subsectors

| Quarters | Decomposition of | DLNGDP_CH_ 1 | DLNGDP_CH_ 2 | DLNGDP_CH_ 3 | VIX |
|----------|------------------|--------------------|---------------------|---------------------|---------------------|
| 1 | DLNGDP_CH_1 | 100.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) |
| | DLNGDP_CH_2 | 0.341 (2.537) | 99.650 (3.042) | 0.009 (1.764) | 0.000 (0.000) |
| | DLNGDP_CH_3 | 4.294 (4.820) | 0.000 (0.000) | 95.706 (4.820) | 0.000 (0.000) |
| | VIX | 0.058 (1.913) | 0.368 (2.364) | 3.895 (4.164) | 95.679 (4.967) |
| | | | | | |
| 2 | DLNGDP_CH_1 | 99.299 (2.888) | 0.621 (2.330) | 0.030 (1.666) | 0.050 (0.585) |
| | DLNGDP_CH_2 | 1.340 (3.870) | 94.35518 (5.033) | 0.650014 (2.858) | 3.654475 (2.296) |
| | DLNGDP_CH_3 | 4.088 (4.897) | 2.816 (4.031) | 91.294 (6.453) | 1.803 (1.699) |
| | VIX | 3.434 (4.749) | 0.276 (2.837) | 3.456 (4.336) | 92.835 (6.467) |
| | | | | | |
| 4 | DLNGDP_CH_1 | 99.000 (4.401) | 0.640 (3.264) | 0.151 (2.716) | 0.209 (0.874) |
| | DLNGDP_CH_2 | 5.823 (6.467) | 89.469 (7.265) | 1.014 (3.446) | 3.694 (2.206) |
| | DLNGDP_CH_3 | 8.305 (6.143) | 2.582 (3.991) | 87.455 (7.251) | 1.658 (1.596) |
| | VIX | 2.599 (4.631) | 1.890 (4.961) | 12.541 (8.466) | 82.970 (9.915) |
| | | | | | |
| 8 | DLNGDP_CH_1 | 98.950 (4.773) | 0.641 (3.438) | 0.197 (2.883) | 0.211 (0.921) |
| | DLNGDP_CH_2 | 6.452 (7.172) | 88.495 (7.912) | 1.172 (3.470) | 3.881 (2.293) |
| | DLNGDP_CH_3 | 8.643 (6.337) | 2.572 (4.000) | 87.121 (7.536) | 1.664 (1.607) |
| | VIX | 3.145 (5.168) | 2.810 (6.441) | 12.582 (8.525) | 81.463 (10.993) |
| | | | | | |
| 12 | DLNGDP_CH_1 | 98.950 (4.817) | 0.641 (3.469) | 0.197 (2.897) | 0.211 (0.924) |
| | DLNGDP_CH_2 | 6.452 (7.238) | 88.483 (7.979) | 1.175 (3.483) | 3.889 (2.303) |
| | DLNGDP_CH_3 | 8.644 (6.349) | 2.573 (4.011) | 87.119 (7.557) | 1.664 (1.610) |
| | VIX | 3.149 (5.190) | 2.840 (6.487) | 12.586 (8.543) | 81.425 (11.047) |
| | | | | | |

Table A.15

Diagnostic tests for the financial channel (I_TP) for China.

| Variables | DLNGDP_CH I_TP | | |
|--|---------------------------|----------|------------------------|
| Lags | 4 | | |
| Dummies | 2001:01, 2008:01, 2009:01 | | |
| Residual autocorrelation test (H0: No serial autocorrelation) | Lags | p-value | |
| | 1 | 0.381 | |
| | 2 | 0.795 | |
| | 3 | 0.310 | |
| | 4 | 0.970 | |
| Heteroscedasticity test (H0: No cross terms) | p-value 0.103 | | |
| Univariate Normality | | | |
| | Skewness | Kurtosis | Normality (p-value) |
| DLNGDP_CH | -0.056 | 3.336 | 0.819 |
| I_TP | -0.057 | 5.403 | 0.000 |

Table A.16

Granger causality tests for the financial channel (I_TP) for China.

Null: I_TP does not Granger cause DLNGDP_CH

Lags 96Q1–14Q4^a

| | |
|---|-------|
| 1 | 0.579 |
| 2 | 0.833 |
| 3 | 0.910 |
| 4 | 0.670 |
| 5 | 0.818 |
| 6 | 0.836 |

^a Models include dummies for 2001:01, 2008:01, 2009:01;

*, **, *** indicate rejection of the null at the 10%, 5%, and 1% levels

Table A.17

Diagnostic tests for the financial channel (I_TP) for China's subsectors.

| Variables | DLNGDP_CH_1 DLNGDP_CH_3 DLNGDP_CH_2 I_TP | | |
|--|---|----------|------------------------|
| Lags | 4 | | |
| Dummies | 1997:03, 2001:01, 2008:01, 2009:01 | | |
| Residual autocorrelation test (H0: No serial autocorrelation) | Lags | p-value | |
| | 1 | 0.168 | |
| | 2 | 0.291 | |
| | 3 | 0.268 | |
| | 4 | 0.640 | |
| Heteroscedasticity test (H0: No cross terms) | p-value 0.209 | | |
| Univariate Normality | | | |
| | Skewness | Kurtosis | Normality (p-value) |
| DLNGDP_CH_1 | 0.537 | 3.391 | 0.126 |
| DLNGDP_CH_3 | -0.165 | 3.204 | 0.788 |
| DLNGDP_CH_2 | -0.200 | 3.376 | 0.620 |
| I_TP | 0.144 | 4.613 | 0.014 |

Table 18

Granger causality tests for the financial channel (I_TP) for China's subsectors.

| Null: I_TP does not Granger cause DLNGDP_CH_1 | | Null: I_TP does not Granger cause DLNGDP_CH_2 | | Null: I_TP does not Granger cause DLNGDP_CH_3 | |
|--|------------------------|--|------------------------|--|------------------------|
| Lags | 96Q1–14Q4 ^a | Lags | 96Q1–14Q4 ^a | Lags | 96Q1–14Q4 ^a |
| 1 | 0.126 | 1 | 0.463 | 1 | 0.076* |
| 2 | 0.130 | 2 | 0.787 | 2 | 0.061* |
| 3 | 0.139 | 3 | 0.505 | 3 | 0.060* |
| 4 | 0.089* | 4 | 0.372 | 4 | 0.265 |

^a Models include dummies for 1997:03, 2001:01, 2008:01, 2009:01;

*, **, *** indicate rejection of the null at the 10%, 5%, and 1% levels

Table A.19

Variance decompositions for the financial channel (I_TP) for China.

| Quarters | Decomposition of | DLNGDP_CH_1 | DLNGDP_CH_2 | DLNGDP_CH_3 | I_TP |
|----------|------------------|--------------------|--------------------|--------------------|--------------------|
| 1 | DLNGDP_CH_1 | 100.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) |
| | DLNGDP_CH_2 | 0.021 (2.117) | 99.947 (2.795) | 0.032 (1.944) | 0.000 (0.000) |
| | DLNGDP_CH_3 | 2.624 (3.964) | 0.000 (0.000) | 97.376 (3.964) | 0.000 (0.000) |
| | I_TP | 0.506 (2.370) | 2.546 (3.740) | 9.588 (6.160) | 87.360 (7.147) |
| 2 | DLNGDP_CH_1 | 95.045 (5.397) | 0.002 (1.880) | 3.053 (4.317) | 1.899 (2.424) |
| | DLNGDP_CH_2 | 2.114 (3.992) | 97.441 (4.821) | 0.382 (3.073) | 0.063 (1.159) |
| | DLNGDP_CH_3 | 2.563 (4.028) | 0.742 (2.808) | 95.985 (4.982) | 0.709 (1.879) |
| | I_TP | 0.759 (2.866) | 7.661 (6.528) | 7.230 (5.919) | 84.350 (8.578) |
| 4 | DLNGDP_CH_1 | 91.229 (7.108) | 0.473 (3.298) | 5.802 (5.524) | 2.497 (3.058) |
| | DLNGDP_CH_2 | 4.189 (5.125) | 90.323 (6.9132) | 2.575 (5.275) | 2.913 (3.616) |
| | DLNGDP_CH_3 | 4.022 (4.580) | 0.905 (3.516) | 92.156 (5.940) | 2.917 (2.991) |
| | I_TP | 0.533 (3.614) | 13.307 (9.358) | 5.574 (6.732) | 80.586 (10.989) |
| 8 | DLNGDP_CH_1 | 89.676 (8.305) | 0.845 (4.276) | 6.637 (6.479) | 2.842 (3.369) |
| | DLNGDP_CH_2 | 5.415 (6.353) | 89.059 (8.260) | 2.782 (6.102) | 2.744 (3.913) |
| | DLNGDP_CH_3 | 4.130 (5.014) | 1.708 (4.476) | 90.818 (6.862) | 3.344 (2.987) |
| | I_TP | 0.579 (5.111) | 20.706 (14.364) | 9.366 (10.255) | 69.348 (16.022) |
| 12 | DLNGDP_CH_1 | 89.259 (9.158) | 0.984 (5.153) | 6.684 (6.722) | 3.074 (3.652) |
| | DLNGDP_CH_2 | 5.813 (7.006) | 88.642 (9.168) | 2.771 (6.489) | 2.774 (4.370) |
| | DLNGDP_CH_3 | 4.112 (5.168) | 1.940 (4.958) | 90.222 (7.414) | 3.726 (3.191) |
| | DLNGDP_TP | 0.951 (5.998) | 25.953 (17.697) | 10.337 (11.479) | 62.759 (19.103) |

Table A.20

Diagnostic tests for the confidence channel (trade shocks) with business confidence.

| Variables | BC DLNGDP_TP | | | |
|--|---------------------------|----------|------------------------|-------|
| Lags | 2 | | | |
| Dummies | 2008:04, 2009:01, 2009:02 | | | |
| Residual autocorrelation test (H0: No serial autocorrelation) | Lags | p-value | | |
| | 1 | 0.041 | | |
| | 2 | 0.201 | | |
| Heteroscedasticity test (H0: No cross terms) | p-value | | | |
| | 0.8166 | | | |
| Univariate normality | Skewness | Kurtosis | Normality (p-value) | |
| | BC | -0.190 | 3.400 | 0.674 |
| | DLNGDP_TP | -0.499 | 3.477 | 0.206 |

Table A.21

Granger causality tests for the confidence channel (trade shocks) with business confidence.

Null: DLNGDP_TP does not Granger cause BC

| Lags | 1999Q1–14Q4 |
|------|-------------|
| 1 | 0.010*** |
| 2 | 0.028** |
| 3 | 0.005*** |
| 4 | 0.013** |

*, **, *** indicate rejection of the null at the 10%, 5%, and 1% levels

Table A.22

Variance decompositions for the confidence channel (trade shocks) with business confidence.

| Quarters | Decomposition of | BC | DLNGDP_TP |
|----------|------------------|--------------------|--------------------|
| 1 | BC | 100.000 (0.000) | 0.000 (0.000) |
| | DLNGDP_TP | 6.172 (6.192) | 93.828 (6.192) |
| 2 | BC | 92.929 (5.047) | 7.071 (5.047) |
| | DLNGDP_TP | 5.052 (5.971) | 94.948 (5.971) |
| 4 | BC | 85.781 (9.836) | 14.219 (9.836) |
| | DLNGDP_TP | 6.799 (6.089) | 93.201 (6.089) |
| 8 | BC | 81.488 (13.361) | 18.512 (13.361) |
| | DLNGDP_TP | 11.967 (8.757) | 88.033 (8.757) |
| 12 | BC | 81.317 (13.641) | 18.683 (13.641) |
| | DLNGDP_TP | 12.478 (9.275) | 87.522 (9.275) |

Table A.23

Diagnostic tests for confidence channel (trade shocks) with consumer confidence.

| Variables | DCC DLNGDP_TP | | |
|--|------------------|----------|------------------------|
| Lags | 3 | | |
| Dummies | 2008:04, 2009:01 | | |
| Residual autocorrelation test (H0: No serial autocorrelation) | Lags | p-value | |
| | 1 | 0.011 | |
| | 2 | 0.059 | |
| | 3 | 0.022 | |
| Heteroscedasticity test (H0: No cross terms) | p-value | | |
| | 0.125 | | |
| Univariate normality | | | |
| | Skewness | Kurtosis | Normality (p-value) |
| DCC | -0.073 | 2.917 | 0.970 |
| DLNGDP_TP | -0.591 | 4.415 | 0.025 |

Table A.24

Granger causality tests for the confidence channel (trade shocks) with consumer confidence.

Null: DLNGDP_TP does not Granger cause DCC

| Lags | 2001Q1–14Q ^a |
|------|-------------------------|
| 1 | 0.000*** |
| 2 | 0.000*** |
| 3 | 0.001*** |
| 4 | 0.001*** |

^a Models include dummies for 2008:04, 2009:01

*, **, *** indicate rejection of the null at the 10%, 5%, and 1% levels

Table A.25

Variance decompositions for the confidence channel (trade shocks) with consumer confidence.

| Quarters | Decomposition of | DCC | DLNGDP_TP |
|----------|------------------|--------------------|--------------------|
| 1 | DCC | 100.000 (0.000) | 0.000 (0.000) |
| | DLNGDP_TP | 0.316 (2.662) | 99.684 (2.662) |
| 2 | DCC | 88.839 (7.878) | 11.161 (7.878) |
| | DLNGDP_TP | 12.753 (8.113) | 87.247 (8.113) |
| 4 | DCC | 88.959 (7.132) | 11.041 (7.132) |
| | DLNGDP_TP | 24.639 (11.907) | 75.361 (11.907) |
| 8 | DCC | 88.935 (7.229) | 11.065 (7.229) |
| | DLNGDP_TP | 24.901 (12.643) | 75.099 (12.643) |
| 12 | DCC | 88.936 (7.243) | 11.065 (7.243) |
| | DLNGDP_TP | 24.907 (12.797) | 75.093 (12.797) |

Table A.26

Diagnostic tests for the confidence channel (VIX shocks) with consumer confidence.

| Variables | DCC VIX | | |
|--|---------------------------|----------|------------------------|
| Lags | 3 | | |
| Dummies | 2002:03, 2008:04, 2011:03 | | |
| Residual autocorrelation test (H0: No serial autocorrelation) | Lags | p-value | |
| | 1 | 0.070 | |
| | 2 | 0.173 | |
| | 3 | 0.347 | |
| Heteroscedasticity test (H0: No cross terms) | p-value | 0.1812 | |
| Univariate Normality | | | |
| | Skewness | Kurtosis | Normality (p-value) |
| DCC | -0.357 | 2.951 | 0.407 |
| VIX | 0.604 | 3.039 | 0.577 |

Table A.27

Granger causality tests for the confidence channel (VIX shocks) with consumer confidence.

Null: VIX does not Granger cause DCC

| Lags | 2001Q1–14Q4 ^a |
|------|--------------------------|
| 1 | 0.171 |
| 2 | 0.013** |
| 3 | 0.000*** |
| 4 | 0.000*** |

^a Models include dummies for 2002:03, 2008:04, 2011:03;

*, **, *** indicate rejection of the null at the 10%, 5%, and 1% levels

Table A.28

Variance decompositions for the confidence channel (VIX) with consumer confidence.

| Quarters | Decomposition of | DCC | VIX |
|----------|------------------|-----------------------|-----------------------|
| 1 | DCC | 100.0000 (0.00000) | 0.0000 (0.000) |
| | VIX | 8.935910 (7.55206) | 91.06409 (7.55206) |
| 2 | DCC | 99.95301 (0.91687) | 0.046993 (0.91687) |
| | VIX | 11.83360 (9.43993) | 88.16640 (9.43993) |
| 4 | DCC | 87.95557 (6.42213) | 12.04443 (6.42213) |
| | VIX | 9.858035 (8.17657) | 90.14197 (8.17657) |
| 8 | DCC | 88.15028 (6.30373) | 11.84972 (6.30373) |
| | VIX | 10.15450 (8.78261) | 89.84550 (8.78261) |
| 12 | DCC | 87.91006 (6.46857) | 12.08994 (6.46857) |
| | VIX | 10.12839 (8.88715) | 89.87161 (8.88715) |

Table A.29

Data sources.

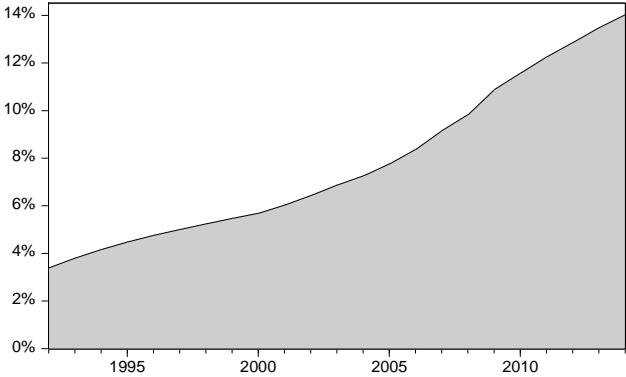
| Series | Source |
|---|---|
| GDP | |
| China, GDP | Datastream (DS Mnemonic: CHGDP...A) |
| China, GDP –Primary industry | Datastream (DS Mnemonic: CHGDPPN.A) |
| China, GDP –Secondary industry | Datastream (DS Mnemonic: CHGDPSN.A) |
| China, GDP –Tertiary industry | Datastream (DS Mnemonic: CHGDPTN.A) |
| US, GDP | Datastream (DS Mnemonic: USGDP...B) |
| Eurozone, GDP | Datastream (DS Mnemonic: EKGDP...B) and data from EABCN (http://www.eabcn.org/area-wide-model) |
| UK, GDP | Datastream (DS Mnemonic: UKGDP...B) |
| Japan, GDP | Datastream (DS Mnemonic: JPGDP...B) |
| GDP deflators | |
| China, price deflator | Datastream (DS Mnemonic: CHXPGDP.F) |
| US, implicit price deflator | Datastream (DS Mnemonic: USGDPIPDE) |
| Eurozone, implicit price deflator | Datastream (DS Mnemonic: EKGDPIPDE)and data from EABCN (http://www.eabcn.org/area-wide-model) |
| UK, implicit price deflator | Datastream (DS Mnemonic: UKGDPIPDE) |
| Japan, implicit price deflator | Datastream (DS Mnemonic: JPGDPIPDE) |
| Interest rates | |
| US, interbank rate – 3-month (London) (month average) | Datastream (DS Mnemonic: USINTER3) |
| European Monetary Union, Euro Interbank Offered Rate –3-month (mean), euro | Datastream (DS Mnemonic: EMINTER3) |
| UK, interbank rate – 3-month (month average) | Datastream (DS Mnemonic: UKINTER3) |
| Japan, 3-month interbank rate (EP) | Datastream (DS Mnemonic: JPINTER3) |
| Exchange rates | |
| Euro to USdollar exchange rate | Datastream (DS Mnemonic: EMXRUSD.) |
| Pound sterling to USdollar exchange rate | Datastream (DS Mnemonic: UKXRUSD.) |
| Yen to USdollar exchange rate | Datastream (DS Mnemonic: JPXRUSD.) |
| VIX | |
| CBOE Spx volatility VIX (New) | Datastream (DS Mnemonic: CBOEVIX) |
| Confidence measures | |
| China business climate index: Industry | Datastream (DS Mnemonic: CHNBCIINR) |
| China consumer confidence – future income confidence | Datastream (DS Mnemonic: CHCNFFUIF) |
| Data were either already seasonally adjusted or we used the x12_arima procedure to achieve seasonal adjustment (We did not seasonally adjust the VIX). If data were of a lower frequency than quarterly, we used averages of the sub-periods. All calculations were performed with the greatest care. Chinese GDP Data were downloaded in May 2015. | |

Table A.30

Dummy variables.

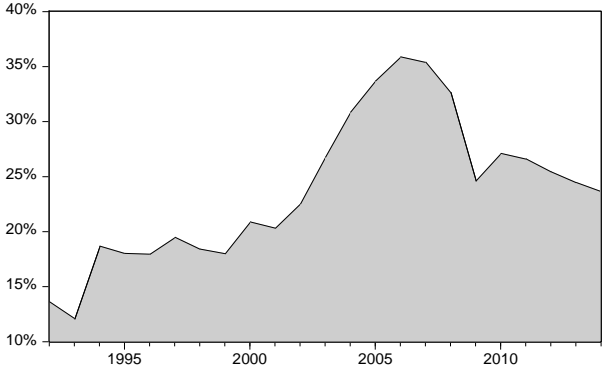
| Dummy | Comment |
|---------|---|
| 1997:03 | Dummy to account for outlier in China's real GDP growth rate |
| 2001:01 | Dummy to account for outlier in interest rate |
| 2002:03 | Outlier in VIX, possibly related to WorldCom Inc. Bankruptcy |
| 2008:01 | Dummy to account for outliers in interest rate |
| 2008:04 | Financial crisis |
| 2009:01 | Financial crisis |
| 2009:02 | Financial crisis |
| 2011:03 | Outlier in VIX, possibly related to concerns about Europe's debt crisis |

B Figures Appendix



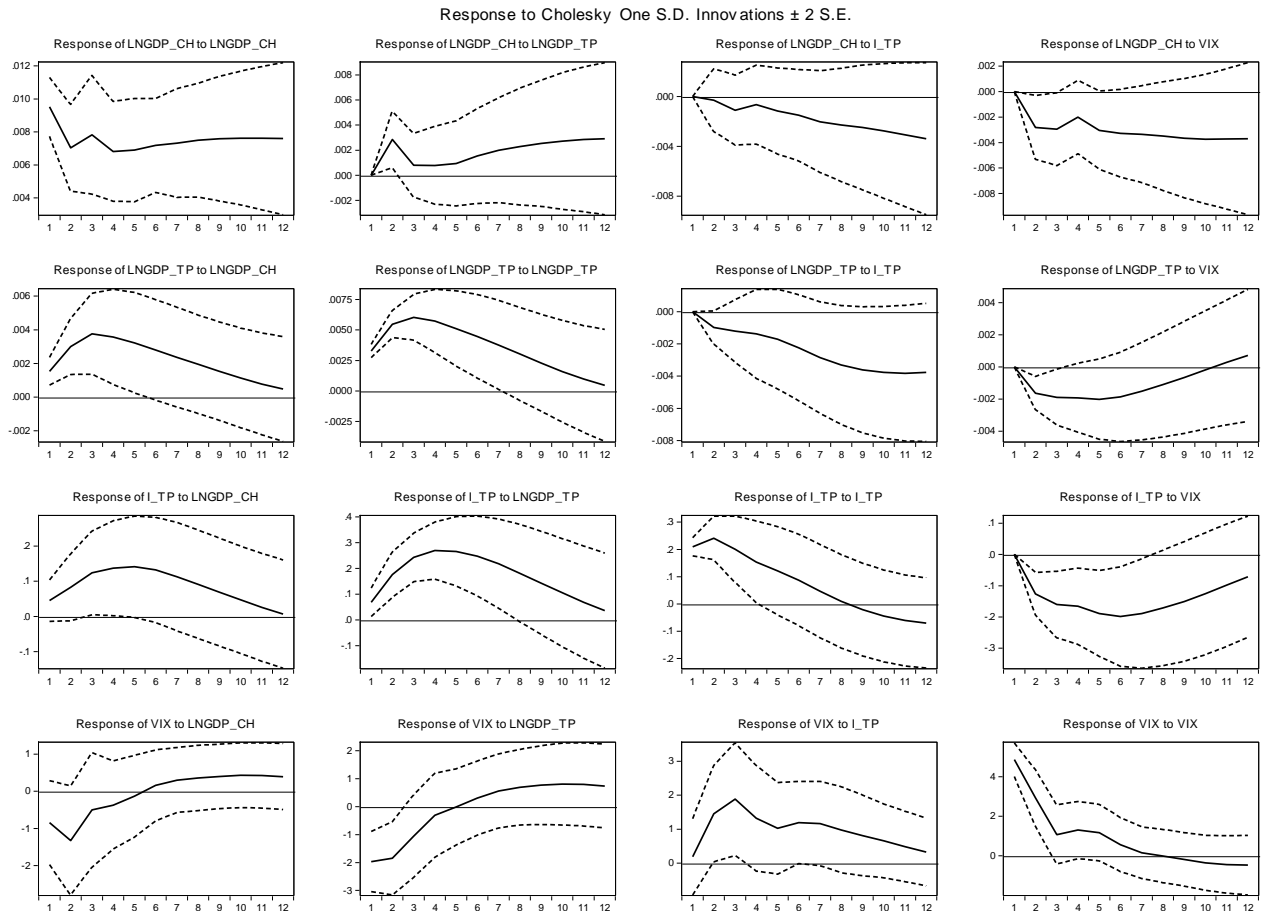
Source: Datastream, own calculations.

Fig. B. 1. Percentage Share of China in the World Economy, 1992–2014 (constant prices).



Source: Datastream, own calculations.

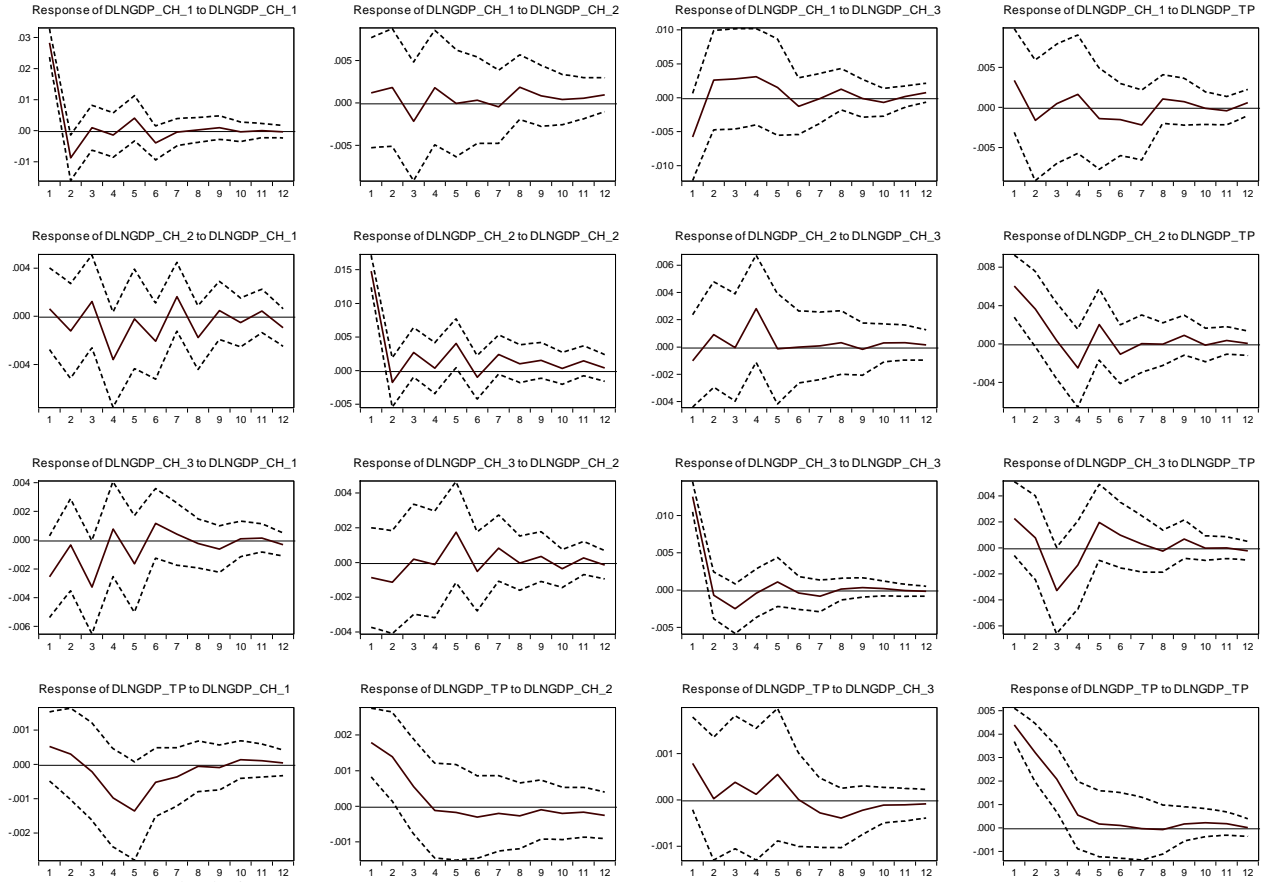
Fig. B. 2. Percentage Share of Exports in Goods & Services, 1992-2014 (% of GDP).



Source: Own calculations.

Fig. B.3. Robustness Check; VAR in levels; Impulse responses of LNGDP_CH, LNGDP_TP, I_TP, VIX.

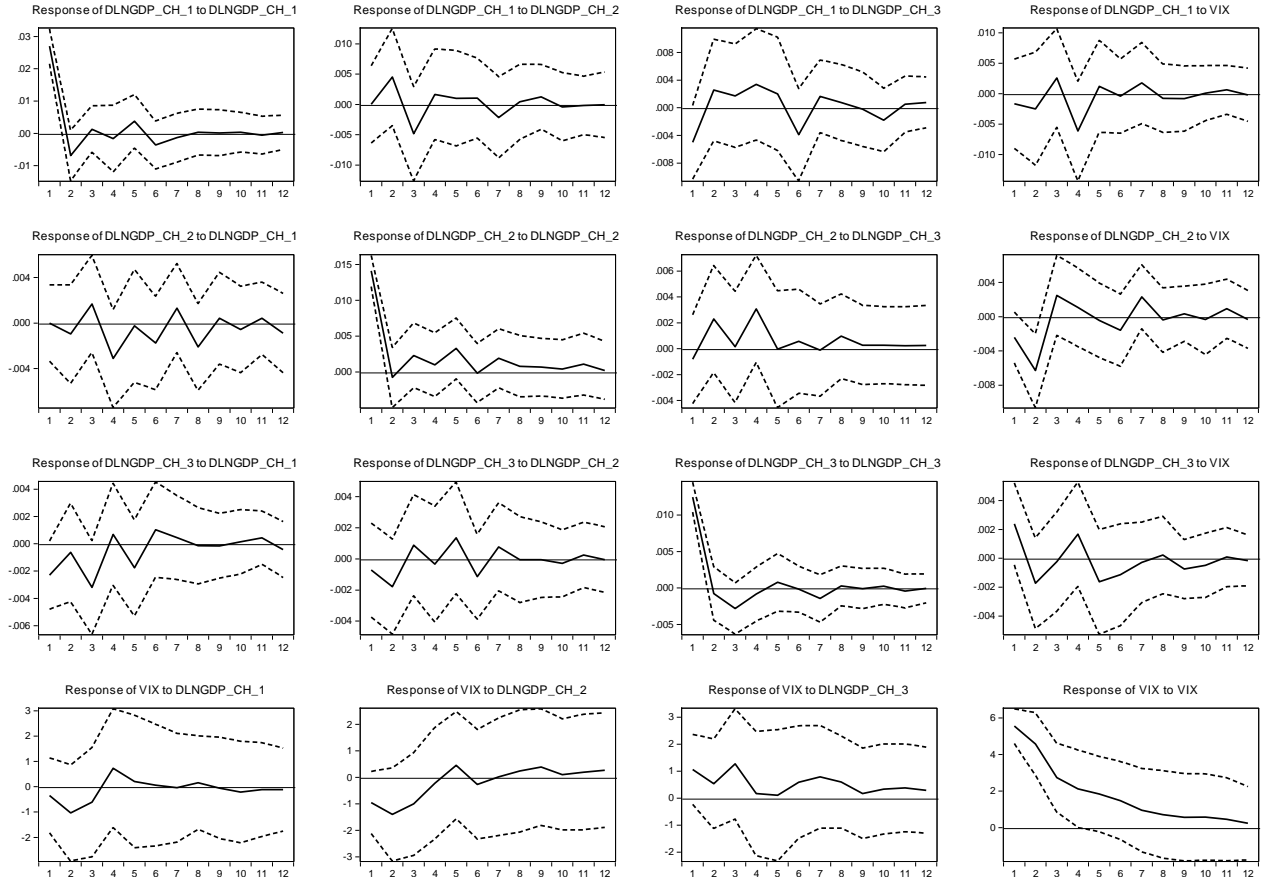
Response to Generalized One S.D. Innovations ± 2 S.E.



Source: Own calculations.

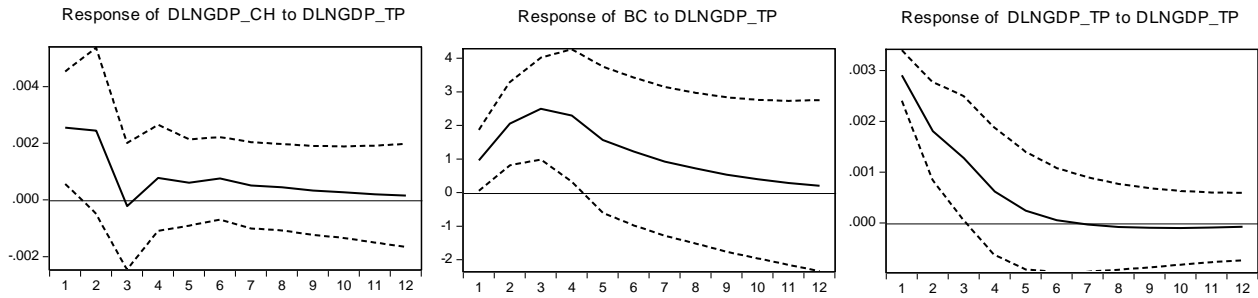
Fig. B. 4. Robustness Check; VAR with generalized impulse responses; Impulse responses of DLNGDP_CH_1, DLNGDP_CH_2, DLNGDP_CH_3, DLNGDP_TP.

Response to Generalized One S.D. Innovations ± 2 S.E.

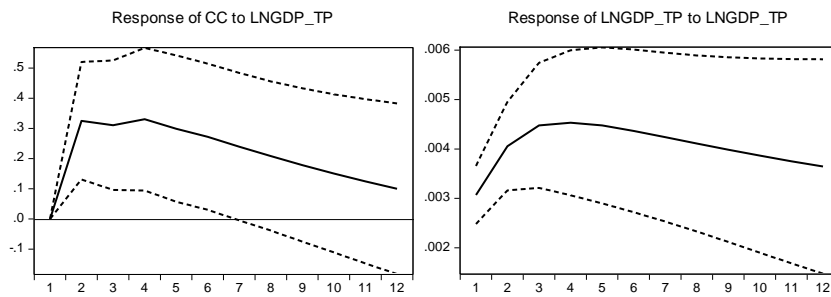


Source: Own calculations.

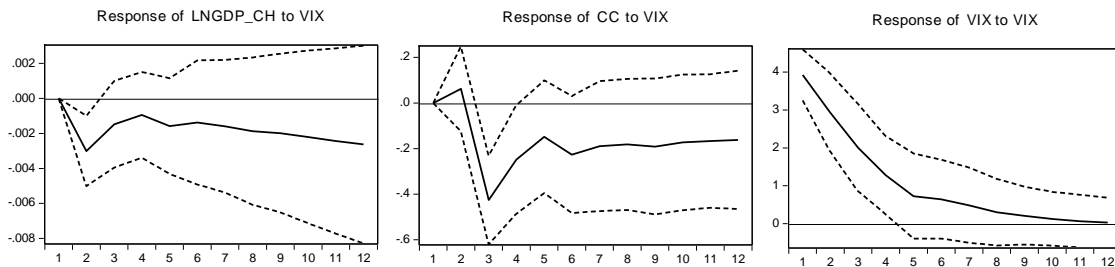
Fig.B.5. Robustness Check; VAR with generalized impulse responses; Impulse responses of DLNGDP_CH_1, DLNGDP_CH_2, DLNGDP_CH_3, VIX.



Source: Own calculations.
 Fig. B. 6. Robustness Check. Impulse responses DLNGDP_CH, BC to DLNGDP_TP.



Source: Own calculations.
 Fig. B.7. Robustness Check. Impulse response of CC to LNGDP_TP.



Source: Own calculations.
 Fig. B.8. Robustness Check. Impulse responses of LNGDP_CH, CC to VIX.

C Channels of business cycle transmission

Most of the literature distinguishes between four potential channels of business cycle transmission.¹ First, there is the trade channel. Higher import demand in a relevant country will increase exports in the other country and lead to higher business cycle synchronization. Empirically this link can be regarded as well established (see Frankel & Rose, 1998; Clark & van Wincoop, 2001; Baxter & Kouparitsas, 2005). In this channel, productivity advances could be transmitted via vertical integration (Kose & Yi, 2001; Arkolakis & Ramanarayanan, 2009). These two effects could increase international business cycle transmission. However, inter-industrial specialization will lead to smaller effects of spillovers if industry-specific shocks occur (see, amongst others, Frankel & Rose, 1998). These arguments could also be applied to China.

Second, we have an exchange rate channel of business cycle transmission. Generally, a shock that causes the domestic currency to depreciate will render domestic products more competitive and lead to rising exports.

Third, there is a financial channel. Increasing financial integration allows investors to diversify their portfolios by investing in different markets. Also, arbitrage will lead to more synchronized financial prices. Johansson (2010) and Wang et al. (2014), for instance, find that China's financial market integration has indeed increased. Eickmeier (2007) points out that there may also be negative effects of financial integration. If capital is mobile, it will be reallocated to economies where it is used most productively, which could lead to a loosening of business cycle co-movements after industry-related shocks. Besides causing capital outflows, our measures could also imply an option value of waiting under uncertainty which has a negative effect on investments in China under increasing financial uncertainty. Firms will invest less and consumers

¹ See also Eickmeier (2007).

may also postpone consumption and thus growth will decrease (Dixit & Pindyck, 1994; Leduc & Liu, 2016; Belke & Osowski, 2018).

Finally, there is a so-called confidence channel. If there is imperfect information concerning the development of foreign variables or the transmission of shocks to these variables to the domestic economy and there are costs in terms of forming expectations, domestic agents will make persistent expectation errors. These errors will add to the effects that would be transmitted via trade and financial markets, influencing domestic consumption and investments.

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