# Dollar and exports

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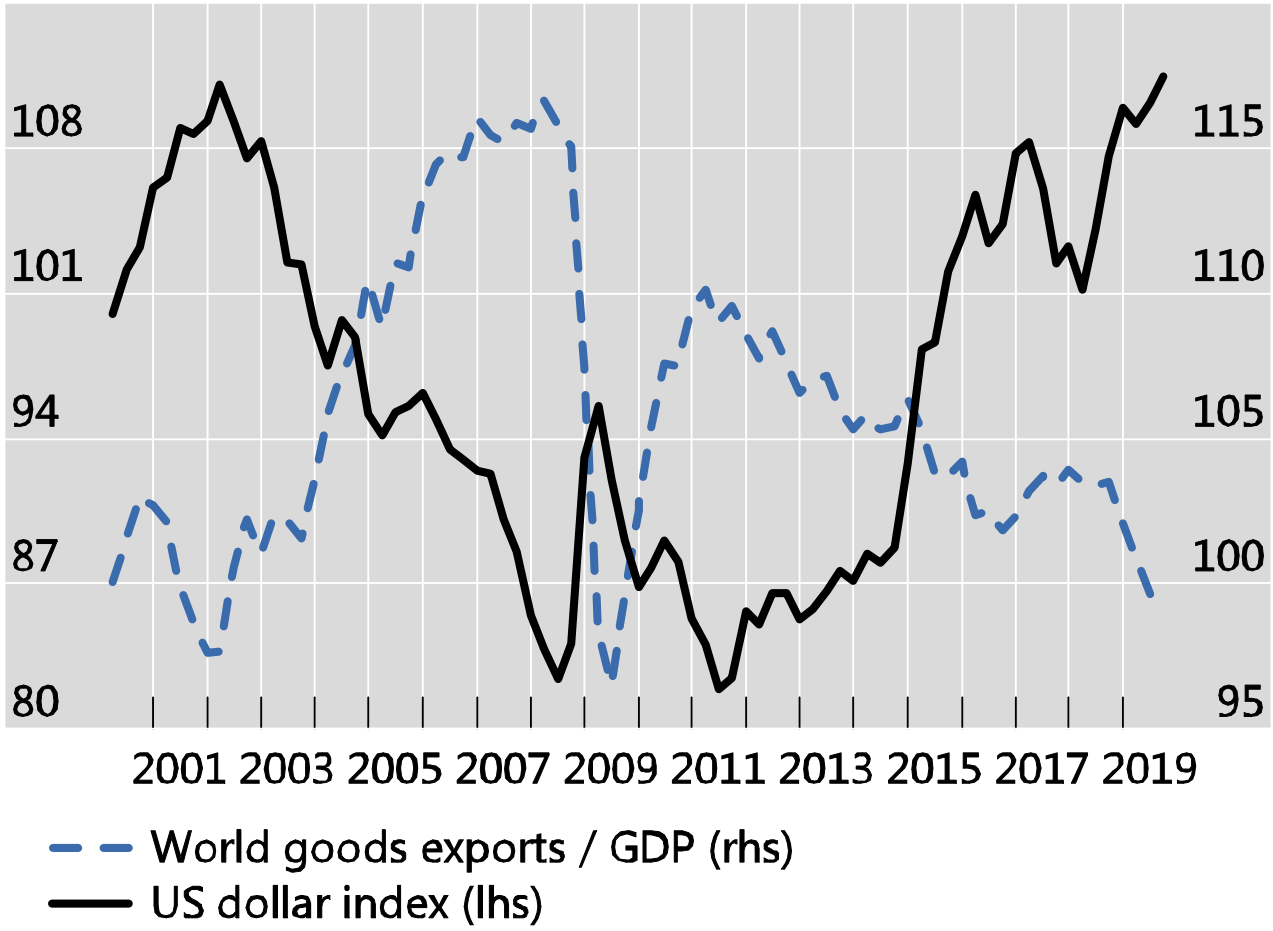
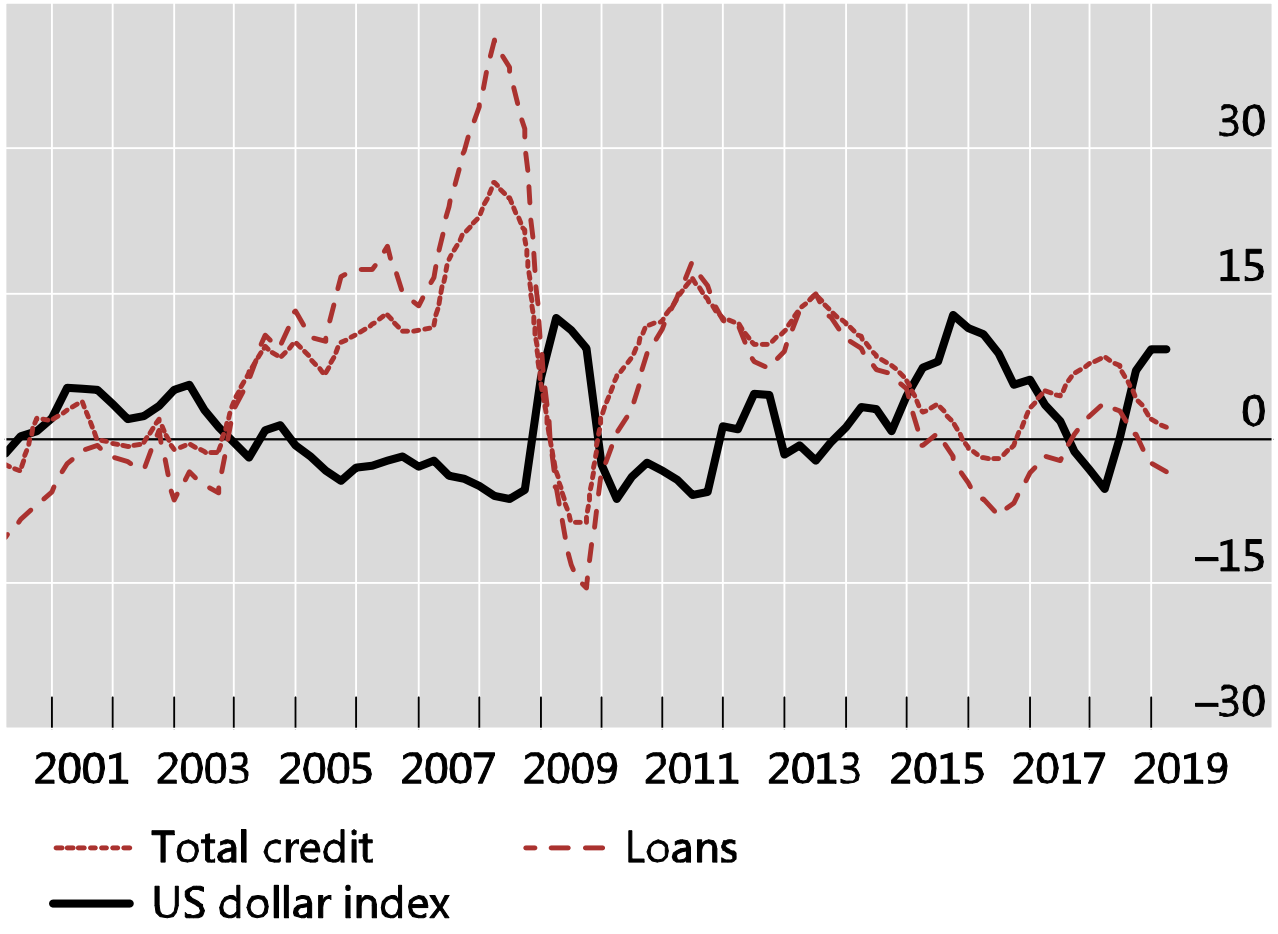
# Ratio of world goods exports to world GDP




(Q1 2000 = 100)

- Merchandise exports to global output ratio fluctuates with dollar index

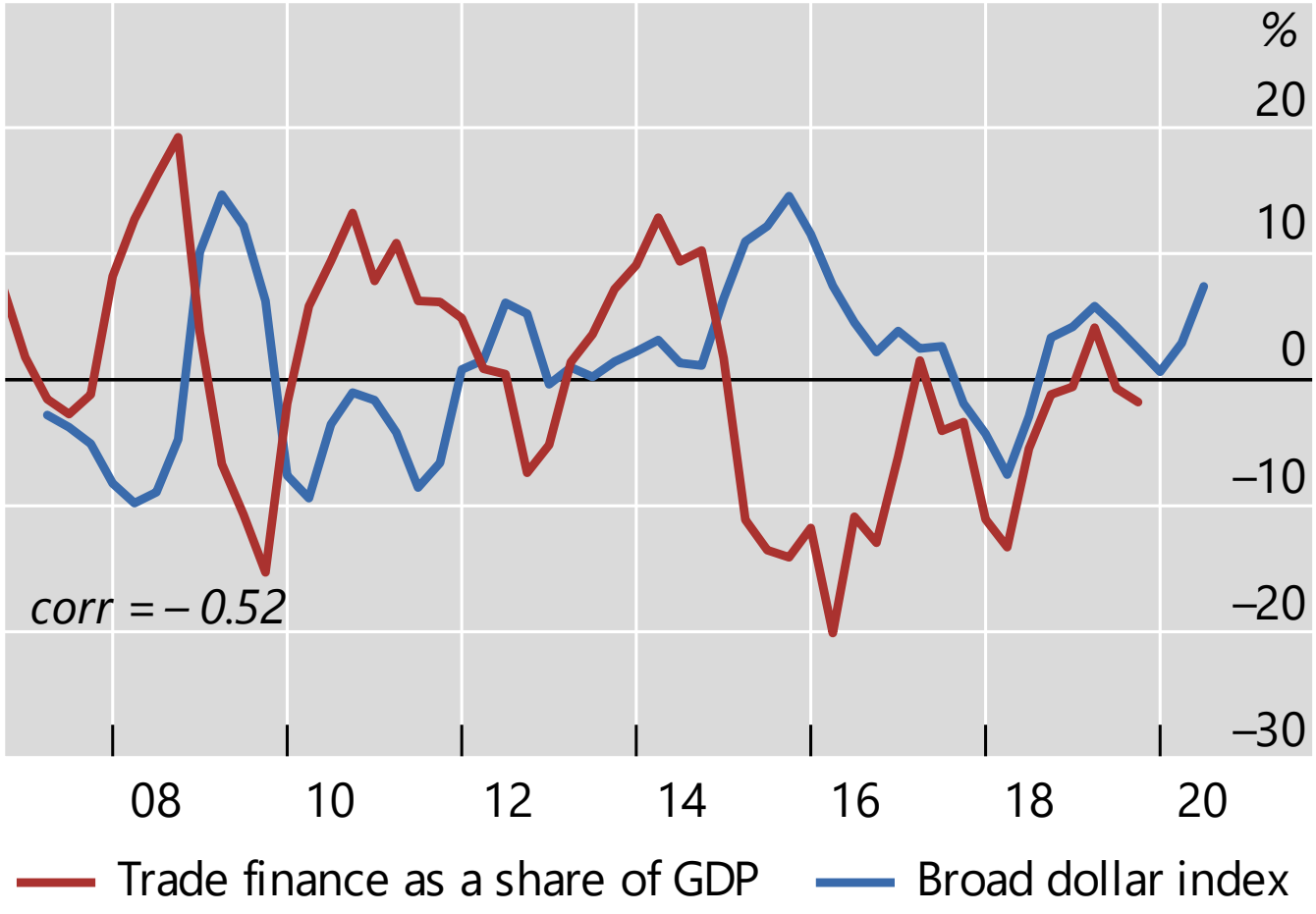
# Dollar-denominated credit to EMEs and dollar index




(Annual percentage change)

- USD denominated credit to non-banks is procyclical

# BIS global trade finance series




(Annual percentage change)

- Trade finance growth is subdued when dollar is strong

# Example: offshore (or not) the first stage of two-stage production

| | | Stages | |
|---|---|---|---|
| | | 1 | 2 |
| Date $t$ | 1 | $w$ | |
| | 2 | $w$ | $w$ |
| | 3 | $w$ | $w$ |
| | ⋮ | ⋮ | ⋮ |

| | | Stages | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Date $t$ | 1 | $c$ | | |
| | 2 | $c$ | 0 | |
| | 3 | $c$ | 0 | $w$ |
| | 4 | $c$ | 0 | $w$ |
| | ⋮ | ⋮ | ⋮ | ⋮ |

- Offshoring lowers stage 1 cost ($c < w$) but takes longer and needs more working capital
- Steady state revenue $p$
- Financing cost for working capital $r$

# Steady state cash flows

- Without offshoring:

$$p - 2w - r\left(2w\left(1+r\right) + w\left(1+r\right)^2\right)$$

- With offshoring:

$$p - \left(c+w\right) - r\left(\left(c+w\right)\left(1+r\right) + c\left(1+r\right)^2 + c\left(1+r\right)^3\right)$$

- Offshore when $r$ is sufficiently low

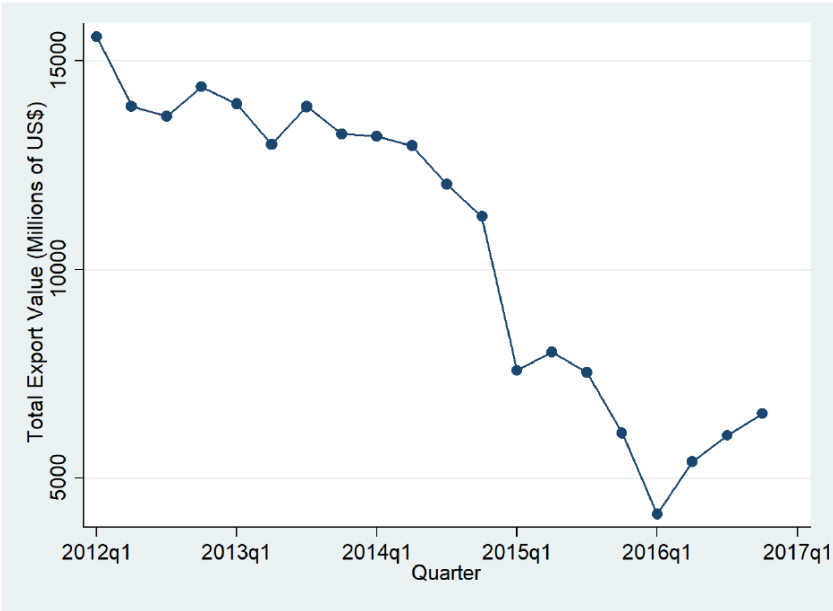
$$1 - \frac{c}{w} > \frac{r\left(1+r\right)^3}{1 + r\left(1+r\right) + r\left(1+r\right)^2 + r\left(1+r\right)^3}$$

(LHS is cost reduction on first stage; RHS is additional working capital cost)

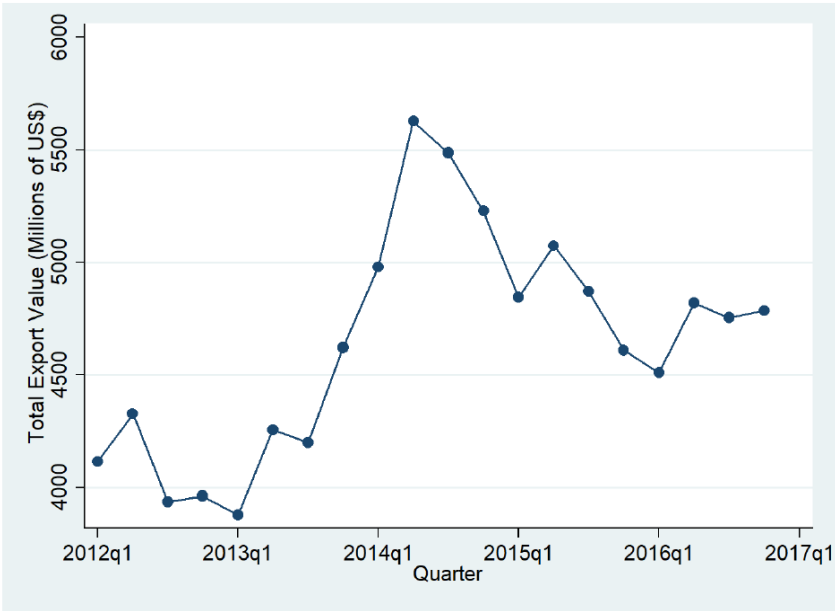
# Mexico as a laboratory for our study

- Exports from customs data
  - product-volume-destination details
  - 4.6 million shipments at 8 digit HS code
- Loan level data
  - match borrowing firm and lending bank
  - firms matched with Capital IQ
- Bank funding sources: Crane, Capital IQ, Fitch
- Sample period: 2011q1- 2017q1

# Export values of two firm subgroups




Firms with dollar bank credit




No dollar bank credit

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- **Financial channel**
  Dollar depreciation eases credit conditions
  (Bruno and Shin (2015))
  Easier credit conditions sustain greater GVC activity
  (this paper)

# Why the broad dollar index?

- Consider global lender with diversified portfolio of dollar credits to borrowers around the world
- Some borrowers face currency mismatch or otherwise benefit from weaker dollar (eg, oil firm)
- Dollar depreciation against whole basket implies:
  - Reduction in credit risk for individual borrowers
  - Reduced tail risk for diversified loan portfolio
  - Reduced Value-at-Risk; spare lending capacity given economic capital
  - Easier dollar credit conditions

Bruno and Shin (RES 2015)

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- **Financial channel**
  Relevant exchange rate is the *broad dollar index*

# Invoicing channel and financing channel

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| $\Delta$USDbroad | -2.0797*** | -1.4940*** | -1.7030*** | -1.8634*** |
| | [0.3935] | [0.4712] | [0.3862] | [0.5962] |
| $\Delta$USD_destination | | | -0.9371*** | -0.8983*** |
| | | | [0.2801] | [0.2983] |
| Constant | 0.0429*** | 0.0396*** | 0.0443*** | 0.0471*** |
| | [0.0100] | [0.0127] | [0.0100] | [0.0130] |
| Firm-product-destination FE | ✓ | ✓ | ✓ | ✓ |
| | | Only USA | | Exclude USA |
| Observations | 196,543 | 74,826 | 195,697 | 120,871 |
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Broad dollar appreciation reduces exports to the US, even though destination currency does not depreciate against dollar

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Both $\Delta$USDbroad and $\Delta$USD_destination are significant

# Dollar credit exposure index for export firms

Cross-sectional variation across banks' funding structure:

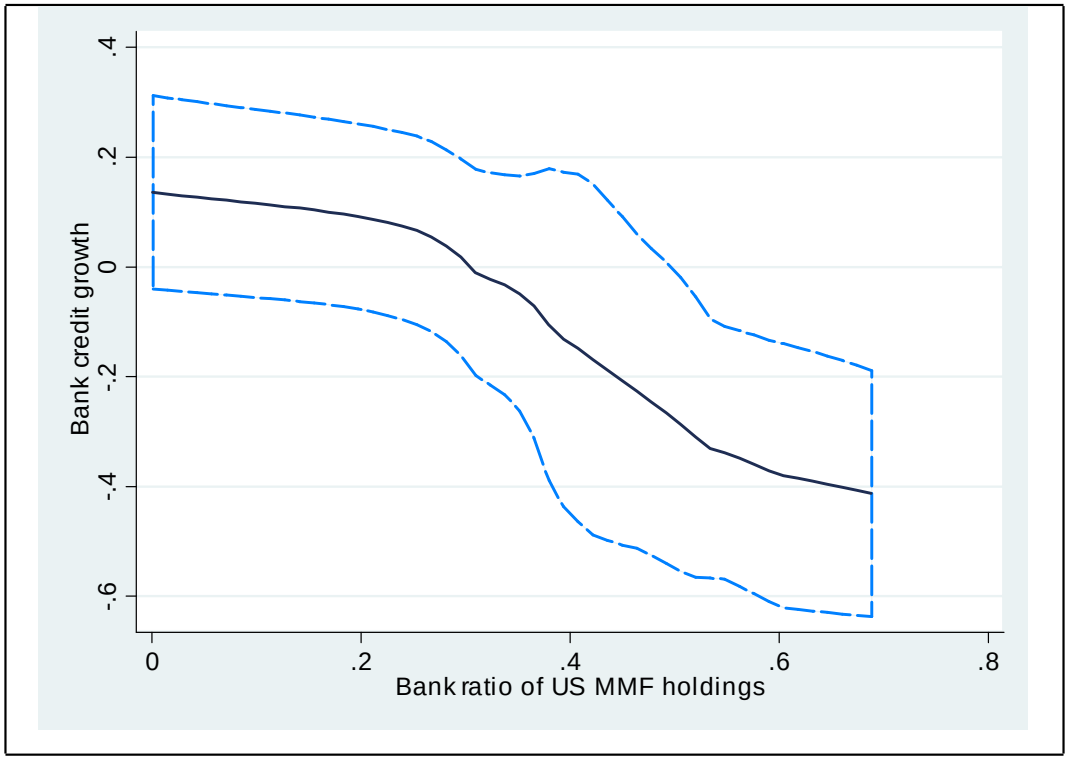
$$MMF_b = \text{ reliance of bank } b \text{ on US MMF funding}$$

Cross-section variation in export firms' indirect exposure to dollar wholesale funding:

$$FMMF_i = \sum_b \omega_{ib} MMF_b$$

where $\omega_{ib}$ is share of credit received by firm $i$ from bank $b$

# Credit supply and bank dollar funding




- Local polynomial smooth plot of the annual growth in bank credit over the period 2013-2016 as a function of the bank's exposure to MMF funding.

# Exports and bank dollar funding

$$\Delta X_{ipdt} = \beta \cdot \Delta USDbroad_{t-1} \cdot FMMF_i + \varphi_{tp} + \upsilon_{td} + \psi_i + \varepsilon_{ipdt}$$

- $\Delta X_{ipdt}$ is the quarterly log difference of the volume of exports of product $p$ to destination $c$ by firm $i$
- $\left\{\varphi_{tp}, \upsilon_{td}, \psi_i\right\}$ are time-product, time-destination, and firm fixed effects

Compare growth in exports of same product to same destination when firms borrow from banks with different exposure to dollar funding shocks

# Exports and bank dollar funding

| Dependent variable | (3) Volume | (4) Volume | (5) Value |
|---|---|---|---|
| $\Delta USDbroad * FMMF_i$ | −8.7606*** | −9.3910** | −12.9056** |
| | [2.7663] | [4.2843] | [5.0267] |
| Constant | 0.0043** | 0.0082*** | 0.0269*** |
| | [0.0019] | [0.0030] | [0.0035] |
| Time-destination FE | ✓ | ✓ | ✓ |
| Time-product FE | ✓ | ✓ | ✓ |
| Firm FE | ✓ | ✓ | ✓ |
| Sample | All | USA dest excluded | All |
| Observations | 50,174 | 37,781 | 50,174 |
| R-squared | 0.307 | 0.320 | 0.266 |

Following 1% US broad dollar appreciation, firms in the upper $FMMF_i$ tercile suffer a reduction of export volumes by 1% more than firms in the lower $FMMF_i$ tercile

# Exporters of intermediate goods

| Sample | (1) Intermediate goods | (2) Consumption goods |
|---|---|---|
| $\Delta USDbroad*FMMF_i$ | −3.8072** | 4.7559 |
| | [1.6089] | [23.8856] |
| Time-destination FE | ✓ | ✓ |
| Product FE | ✓ | ✓ |
| Firm FE | ✓ | ✓ |
| Constant | 0.0034** | -0.0049 |
| | [0.0014] | [0.0080] |
| Observations | 35,395 | 18,146 |
| R-squared | 0.112 | 0.158 |

# Conclusions

- Dollar exchange rate is determinant of exports, but *in the opposite direction* to the trade channel of exchange rate
- Firms exposed to banks that are more dependent on wholesale US dollar funding suffer a larger negative effect on exports following an appreciation of the dollar
- Dollar exchange rate feeds through bank credit supply to the exporting firm
  - More pronounced for intermediate goods exporters
- Dollar exchange rate is barometer of dollar credit conditions for firms' working capital

*What happens in financial markets doesn't always stay in financial markets; they spill over to real economic activity*