Appendix to "Trade Protection, Stock-Market Returns, and Welfare"

December 19, 2024

Contents

Introduction

This online appendix contains supplementary theoretical and empirical results. Section A presents the proofs of the propositions in the theory section and model extensions. Section B generalizes of our framework that allows for growth. Section C turns to data and measurement issues. We present the sources for each event in Section C.1. Section C.2 provides a list of all the variables and the data sources used. Sections C.3 and C.3 provide more details on the data sources and construction of the China-exposure variables. Section G.2 presents sample statistics.

Next, we provide additional details for the welfare calculations. Section D describes how we reweight our sample of publicly listed firms using the size distribution of U.S. firms. Section E provides details of the procedure to estimate the changes in discount rates, with additional robustness tables in Section F. We provide details of the calculations of the static and dynamic price effects in Section G. Finally, we provide more details of the estimation of treatment effects in Section H.

A Proofs

A.1 Proof of Proposition 1

Proposition. *1 If the elasticity of substitution between labor and the specific factor for all firms is constant, then the log change in wages equals the employment-share weighted average of the log changes in cash flow, i.e.,*

$$\hat{w}_t = \sum_f \frac{L_f}{L} \hat{r}_{ft},$$

and the log change in employment in each firm equals $\hat{L}_{ft} = \sigma \left(\hat{r}_{ft} - \sum_{f'} \frac{L_{f'}}{L} \hat{r}_{f't} \right)$.

Proof. Totally differentiating equations (2) and (3) yields:

$$\hat{y}_{ft} = -\hat{a}_{Vft}, \tag{A1}$$

and

$$\sum_f \frac{L_f}{L} \left(\hat{a}_{Lft} - \hat{a}_{Vft} \right) = \hat{L}, \tag{A2}$$

where we have used the fact that in the baseline equilibrium $L_{ft} = L_f$. Substituting equation (4) into the previous equation yields

$$-\sum_f \frac{L_f}{L} \sigma \left(\hat{w}_t - \hat{r}_{ft} \right) = \hat{L}, \tag{A3}$$

or

$$\hat{w}_t = \sum_f \frac{L_f}{L} \hat{r}_{ft} - \frac{\hat{L}}{\sigma} \tag{A4}$$

If the supply of labor is fixed, we have $\hat{L} = 0$, which establishes that

$$\hat{w}_t = \sum_f \frac{L_f}{L} \hat{r}_{ft}. \tag{A5}$$

Substituting equation (A1) into equation (4) yields

$$-\hat{y}_{ft} - \hat{a}_{Lft} = \sigma \left(\hat{w}_t - \hat{r}_{ft} \right) \tag{A6}$$

or

$$\hat{L}_{ft} = \sigma \left(\hat{r}_{ft} - \hat{w}_t \right) = \sigma \left(\hat{r}_{ft} - \sum_{f'} \frac{L_{f'}}{L} \hat{r}_{f't} \right). \tag{A7}$$

□

A.1.1 Extension of Proposition 1 to Model Endogenous Aggregate Employment Rates

Starting with equation (A4), we now can add an upward-sloping labor-supply curve by defining the log change in employment relative to some base level L as

$$\hat{L}_t = \hat{L}_t^s = \tilde{\sigma} \hat{w}_t,$$

where $\tilde{\sigma} > 0$ denotes the slope of the labor-supply curve. Substituting the expression for $\hat{L}_t^s$ into equation (A4) gives us

$$\hat{w}_t = \sum_f \frac{L_f}{L} \hat{r}_{ft} - \frac{\tilde{\sigma} \hat{w}_t}{\sigma}$$

$$\hat{w}_t = \sum_f \frac{L_f}{L} \hat{r}_{ft} - \frac{\tilde{\sigma}}{\sigma} \sum_f \frac{L_f}{L} \hat{r}_{ft}$$

$$\hat{w}_t = \left(1 - \frac{\tilde{\sigma}}{\sigma} \right) \sum_f \frac{L_f}{L} \hat{r}_{ft},$$

which proves that wages will rise with changes in cash flow as long as $\tilde{\sigma} < \sigma$, i.e., the labor-supply response cannot be too large. Substituting this expression into equation (A7) gives us

$$\hat{L}_{ft} = \sigma \left(\hat{r}_{ft} - \hat{w}_t \right) = \sigma \left(\hat{r}_{ft} - \left(1 - \frac{\tilde{\sigma}}{\sigma} \right) \sum_f \frac{L_f}{L} \hat{r}_{ft} \right).$$

This expression continues to show that the relative employment of a firm increases when it has higher returns to its specific factor. Thus, the relationship between log change in firm employment and returns to its specific factor in Proposition 1 is robust to allowing for an upward sloping labor supply curve.

A.2 Proof of Proposition 2

Proposition. 2 *The sum of log changes in the effective rates of protection ($\hat{p}^e_{ft}$) and adjusted productivity $\left(\frac{\hat{A}_{ft}}{1 - \sum_i \omega_{ift}} \right)$ for a firm can be expressed as a linear function of the log changes in cash flows ($\hat{r}_{ft}$):*

$$\hat{p}^e_{ft} + \frac{\hat{A}_{ft}}{1 - \sum_i \omega_{ift}} = \left(\frac{\omega_{Vft}}{1 - \sum_i \omega_{ift}} \right) \hat{r}_{ft} + \left(\frac{\omega_{Lft}}{1 - \sum_i \omega_{ift}} \right) \sum_{f'} \frac{L_{f't}}{L} \hat{r}_{f't}.$$

Moreover, the log changes in firm cash flows ($\hat{r}_{ft}$) and wages ($\hat{w}_t$) can be expressed as linear functions of the log changes in effective rates of protection ($\hat{p}^e_{ft}$) and productivity ($\hat{A}_{ft}$):

$$\hat{w}_t = \sum_f \varphi_{ft} \left(\hat{p}^e_{ft} + \frac{\hat{A}_{ft}}{1 - \sum_i \omega_{ift}} \right) \textit{ and}$$

$$\hat{r}_{ft} = \left(\frac{1 - \sum_i \omega_{ift}}{\omega_{Vft}} \right) \left(\hat{p}^e_{ft} + \frac{\hat{A}_{ft}}{1 - \sum_i \omega_{ift}} \right) - \left(\frac{\omega_{Lft}}{\omega_{Vft}} \right) \sum_f \varphi_{ft} \left(\hat{p}^e_{ft} + \frac{\hat{A}_{ft}}{1 - \sum_i \omega_{ift}} \right),$$

where $\varphi_{ft} = L_{ft} \left(\frac{1 - \sum_i \omega_{ift}}{\omega_{Vft}} \right) / \sum_{f'} L_{f't} \left(\frac{1 - \sum_i \omega_{if't}}{\omega_{Vf't}} \right)$.

Proof. We begin by totally differentiation equation (1) and dividing both sides by p_{ft} to obtain

$$\omega_{Lft}\hat{w}_t + \omega_{Vft}\hat{r}_{ft} + \sum_i \omega_{ift}\hat{q}_{it} - \hat{A}_{ft} = \hat{p}_{ft}, \tag{A8}$$

where we have made use of the fact that

$$\omega_{Lft}\hat{a}_{Lft} + \omega_{Vft}\hat{a}_{Vft} + \sum_i \omega_{ift}\hat{a}_{ift} = -\hat{A}_{ft}.$$

Using the definition of effective rates of protection in equation (5) and Proposition (1), we can rearrange equation (A8) to arrive at the first equation in the proposition:

$$\hat{p}^e_{ft} + \frac{\hat{A}_{ft}}{1 - \sum_i \omega_{ift}} = \left(\frac{\omega_{Vft}}{1 - \sum_i \omega_{ift}} \right) \hat{r}_{ft} + \left(\frac{\omega_{Lft}}{1 - \sum_i \omega_{ift}} \right) \sum_{f'} \frac{L_{f't}}{L} \hat{r}_{f't}.$$

Then, it is straightforward to solve for $\hat{w}_t$ and $\hat{r}_{ft}$ in terms of $\hat{p}^e_{ft}$ and $\hat{A}_{ft}$. Specifically, we have

$$\begin{aligned}
\left(\frac{\omega_{Lft}}{\omega_{Vft}} \right) \hat{w}_t + \hat{r}_{ft} &= \left(\frac{1 - \sum_i \omega_{ift}}{\omega_{Vft}} \right) \left(\hat{p}^e_{ft} + \frac{\hat{A}_{ft}}{1 - \sum_i \omega_{ift}} \right) \\
\left[\sum_f \frac{L_{ft}}{L} \left(\frac{\omega_{Lft}}{\omega_{Vft}} \right) + 1 \right] \hat{w}_t &= \sum_f \frac{L_{ft}}{L} \left(\frac{1 - \sum_i \omega_{ift}}{\omega_{Vft}} \right) \left(\hat{p}^e_{ft} + \frac{\hat{A}_{ft}}{1 - \sum_i \omega_{ift}} \right) \\
\left[\sum_f L_{ft} \left(\frac{1 - \sum_i \omega_{ift}}{\omega_{Vft}} \right) \right] \hat{w}_t &= \sum_f L_{ft} \left(\frac{1 - \sum_i \omega_{ift}}{\omega_{Vft}} \right) \left(\hat{p}^e_{ft} + \frac{\hat{A}_{ft}}{1 - \sum_i \omega_{ift}} \right) \\
\hat{w}_t &= \sum_f \varphi_{ft} \left(\hat{p}^e_{ft} + \frac{\hat{A}_{ft}}{1 - \sum_i \omega_{ift}} \right),
\end{aligned}$$

where Proposition (1) was used to derive the second line. Substituting the solution for $\hat{w}_t$ back into the first line, we get

$$\hat{r}_{ft} = \left(\frac{1 - \sum_i \omega_{ift}}{\omega_{Vft}} \right) \left(\hat{p}^e_{ft} + \frac{\hat{A}_{ft}}{1 - \sum_i \omega_{ift}} \right) - \left(\frac{\omega_{Lft}}{\omega_{Vft}} \right) \sum_f \varphi_{ft} \left(\hat{p}^e_{ft} + \frac{\hat{A}_{ft}}{1 - \sum_i \omega_{ift}} \right).$$

□

A.3 Proof of Proposition 3

Proposition. *3 For an agent with log utility, the consumption-equivalent welfare effect of the deviation path $(\hat{C}_t)_{t=0}^{\infty}$ is*

$$\mathcal{C} = (1-\rho)\sum_{t=0}^{\infty}\rho^t \mathrm{E}_0\left[\hat{C}_t\right],$$

where $\rho \equiv 1 - C_t/W_t$ denotes the consumption-to-wealth ratio..

Proof. The value function of an agent with log utility is

$$\mathcal{W}_0 = \sum_{t=0}^{\infty}\beta^t \mathrm{E}_0\left[\ln C_t\right]$$

where β denotes the agent's subjective discount factor. The consumption-equivalent welfare effect $\mathcal{C}$ is defined as the percent change in consumption, in every state and every period, that is welfare-equivalent to the change in the agent's consumption path. Formally, $\mathcal{C}$must solve:

$$\begin{aligned}
\sum_{t=0}^{\infty}\mathrm{E}_0\left[\frac{\beta^t}{C_t}\times C_t\mathcal{C}\right] &= \sum_{t=0}^{\infty}\mathrm{E}_0\left[\frac{\beta^t}{C_t}\times C_t\hat{C}_t\right]\\
\implies \left(\sum_{t=0}^{\infty}\beta^t\right)\mathcal{C} &= \sum_{t=0}^{\infty}\mathrm{E}_0\left[\beta^t\hat{C}_t\right]\\
\implies \mathcal{C} &= (1-\beta)\sum_{t=0}^{\infty}\mathrm{E}_0\left[\beta^t\hat{C}_t\right].
\end{aligned}$$

To conclude the proof, note that, with log-utility, the consumption-to-wealth ratio is equal to $1-\beta$, and so have $\rho = \beta$. The reason we use the notation ρ rather than β is that ρ is the relevant discount factor in the more general case of Epstein-Zin utilities (see Section B.3). □

A.4 Proof of Proposition 4

Proposition. *4 Around a baseline path in which the ratio of cash flow to firm value, $r_{ft}V_f/\Pi_{ft}$, is equal to the constant consumption-to-wealth ratio, C_t/W_t, we have:*

$$\hat{\Pi}_{f0} = (1-\rho)\sum_{t=0}^{\infty}\rho^t\mathrm{E}_0\left[\hat{r}_{ft}\right] - \sum_{t=1}^{\infty}\rho^t\mathrm{E}_0\left[\hat{R}_{ft}\right]$$

Proof. Differentiating the PDV relationship (12) gives

$$\begin{aligned}
\hat{\Pi}_{f0} &= \frac{1}{\Pi_{f0}}\mathrm{E}_0\left[\sum_{t=0}^{\infty}\frac{r_{ft}V_f}{R_{f1}\dots R_{ft}}\left(\hat{r}_{ft}-\sum_{s=1}^{t}\hat{R}_{fs}\right)\right]\\
&= \frac{1}{\Pi_{f0}}\mathrm{E}_0\left[\sum_{t=0}^{\infty}\frac{r_{ft}V_f}{R_{f1}\dots R_{ft}}\hat{r}_{ft}\right]-\frac{1}{\Pi_{f0}}\sum_{t=1}^{\infty}\mathrm{E}_0\left[\left(\sum_{s=t}^{\infty}\frac{r_{fs}V_f}{R_{f1}\dots R_{fs}}\right)\hat{R}_{ft}\right]\\
&= \frac{1}{\Pi_{f0}}\mathrm{E}_0\left[\sum_{t=0}^{\infty}\frac{r_{ft}V_f}{R_{f1}\dots R_{ft}}\hat{r}_{ft}\right]-\frac{1}{\Pi_{f0}}\sum_{t=1}^{\infty}\mathrm{E}_0\left[\frac{1}{R_{f1}\dots R_{ft}}\mathrm{E}_t\left[\sum_{s=t}^{\infty}\frac{r_{fs}V_f}{R_{ft+1}\dots R_{fs}}\right]\hat{R}_{ft}\right]\\
&= \sum_{t=0}^{\infty}\mathrm{E}_0\left[\frac{r_{ft}V_f}{\Pi_{ft}}\frac{\Pi_{ft}/\Pi_{f0}}{R_{f1}\dots R_{ft}}\hat{r}_{ft}\right]-\sum_{t=1}^{\infty}\mathrm{E}_0\left[\frac{\Pi_{ft}/\Pi_{f0}}{R_{f1}\dots R_{ft}}\hat{R}_{ft}\right]
\end{aligned}$$

where the second line uses the fact that $\Pi_{ft}=\mathrm{E}_t\left[\sum_{s=t}^{\infty}\frac{r_{fs}V_f}{R_{ft+1}\dots R_{fs}}\right]$, following (12). We then use the assumption that on the baseline path $r_{ft}V_f/\Pi_{ft}$ is constant and equal to C_t/W_t (if not, all of our equalities should be understood as being first-order approximations around this baseline path, as in Campbell and Shiller (1988)).[1] In particular, using the definition of ρ above, we can write $(\Pi_{ft}-r_{ft}V_f)/\Pi_{ft}=\rho$, which implies:

$$R_{ft+1}=\frac{\Pi_{ft+1}}{\Pi_{ft}-r_{ft}V_f}=\frac{1}{\rho}\frac{\Pi_{ft+1}}{\Pi_{ft}}$$

Plugging this into the previous equation gives:

$$\hat{\Pi}_{f0}=(1-\rho)\sum_{t=0}^{\infty}\rho^t\mathrm{E}_0\left[\hat{r}_{ft}\right]-\sum_{t=1}^{\infty}\rho^t\mathrm{E}_0\left[\hat{R}_{ft}\right]$$

□

B Model Extensions

B.1 Adding Growth

The baseline model that we analyze does not allow for growth, but we can easily change it to a model in which productivity rises by ϕ each period. We demonstrate that the only effect of increasing productivity in this setup is to cause output, wages, and payments to the specific factor to rise by ϕ each period. We do this by showing that if output grows at a rate ϕ and prices do not change, then all factor and product markets will clear, and firms will continue to earn zero profits. We then show that if output grows at a rate ϕ, firms have no incentive to change prices, which means that we have identified an equilibrium. We model growth in our setup by assuming that firm output in each period is given by

$$y_{ft}=h\left(\phi^tV_f,\phi^tL_{ft},m_{ift}\right),$$

[1] The underlying assumption is that, on the baseline path, consumption growth is i.i.d. and the cash flow of each firm grows at the same rate as aggregate consumption.

where $\phi \geq 1$ is a parameter that determines TFP growth. Since labor and the specific factor are paid the value of their marginal product, we can write the wage and rental rate equations as

$$w_t = \phi^t h_L p_{ft} \quad \text{and} \quad r_{ft} = \phi^t h_V p_{ft}.$$

Thus, if firms do not change their employment levels and prices do not change, we will have $\Delta \ln w_t = \Delta \ln r_{ft} = \phi$. This result implies that real incomes will rise by ϕ, which means that if demand is homothetic and prices do not change, output will rise by ϕ. We also know from Proposition 1 that each firm will continue to employ the same number of workers as in period 0 if wages and rental rates rise by the same amount.

The new factor market clearing conditions in each time period will be

$$\sum_f \frac{a_{Lf0}}{\phi^t} \left(\phi^t y_{f0}\right) = L, \text{ and}$$

$$\frac{a_{Vf0}}{\phi^t} \left(\phi^t y_{f0}\right) = V_f.$$

An important implication of these equations is that if markets clear in period 0, they will also clear in period t.

Finally, we show that an equilibrium featuring no changes in prices from those in period 0 will also satisfy the zero-profit condition. In order to do this, we first show that the unit-input requirement for materials doesn't change because separability of the production function means that

$$a_{ift} = \frac{m_{ift}}{y_{ft}} = \frac{a_{if0} y_{ft}}{y_{ft}} = a_{if0}.$$

One implication of this result is that intermediate input use grows at the same rate as output growth, i.e., $\Delta \ln m_{ift} = \Delta \ln y_{ft} = \phi$. If output in period t is given by $\phi^t y_{ft}$ and prices do not change, then the zero-profit condition (equation 1) can be written as

$$a_{Lft} w_t + a_{Vft} r_{ft} + \sum_i a_{ift} q_{it} = p_{ft}$$

$$\frac{a_{Lf0}}{\phi^t} \left(\phi^t w_0\right) + \frac{a_{Vf0}}{\phi^t} \left(\phi^t r_{f0}\right) + \sum_i a_{if0} q_{it} = p_{ft}$$

$$a_{Lf0} w_0 + a_{Vf0} r_{f0} + \sum_i a_{if0} q_{it} = p_{ft}.$$

Since we know that these equations hold in period 0, we know that if $q_{it} = q_{i0}$, then $p_{ft} = p_{f0.}$ Intermediate input prices will not change if labor and specific factor productivity growth affects all firms equally because intermediate input usage, consumer demand, and supply will all grow at a rate of ϕ.

B.2 Nesting the Neoclassical Static Welfare Effects in Our Setup

The neoclassical welfare effects are based on three additional assumptions: tariff changes are permanent (trivially true in a two-period model); they have no productivity effects (i.e., $\hat{A}_{ft} = \hat{A}_f = 0$); and there are only two periods so, $\hat{p}^e_{ft} = \hat{p}^{e\tau}_f$, and $\hat{r}_{ft} = \hat{r}^\tau_f$, where $\hat{r}^\tau_f$ and

$\hat{p}^{e\tau}_f$ denote the tariff-induced changes in firm cash flow and ERP *under the assumption that tariffs do not affect productivity*. We can see why these assumptions would yield different estimates than those in our setup by starting with equation (11) and noting that the first term in the equation gives us the role that cash flow plays in determining welfare:

$$\mathcal{C}_{\hat{r}} \equiv \sum_f \frac{wL_f + r_f V_f}{C} \left((1-\rho) \sum_{t=0}^{\infty} \rho^t \mathrm{E}_0[\hat{r}_{ft}] \right).$$

We can then use Proposition 2 to rewrite this as

$$\begin{aligned} \mathcal{C}_{\hat{r}} = & \sum_f \frac{wL_f + r_f V_f}{C} \left((1-\rho) \sum_{t=0}^{\infty} \rho^t \mathrm{E}_0 \left[\left(\frac{1-\sum_i \omega_{if}}{\omega_{Vf}} \right) \left(\hat{p}^e_{ft} + \frac{\hat{A}_{ft}}{1-\sum_i \omega_{if}} \right) \right] \right) \\ & - \sum_f \frac{wL_f + r_f V_f}{C} \left(\frac{\omega_{Lf}}{\omega_{Vf}} \sum_f \varphi_f \mathrm{E}_0 \left[\left(\hat{p}^e_{ft} + \frac{\hat{A}_{ft}}{1-\sum_i \omega_{if}} \right) \right] \right) \end{aligned}$$

We can rewrite this as

$$\begin{aligned} \mathcal{C}_{\hat{r}} = & \sum_f \frac{wL_f + r_f V_f}{C} \left((1-\rho) \sum_{t=0}^{\infty} \rho^t \mathrm{E}_0 \left[\left(\frac{1-\sum_i \omega_{if}}{\omega_{Vf}} \right) \left(\hat{p}^e_{ft} + \frac{\hat{A}_{ft}}{1-\sum_i \omega_{if}} \right) \right] \right) \\ & - \sum_f \frac{wL_f + r_f V_f}{C} \left(\frac{\omega_{Lf}}{\omega_{Vf}} \sum_f \varphi_f \mathrm{E}_0 \left[\left(\hat{p}^e_{ft} + \frac{\hat{A}_{ft}}{1-\sum_i \omega_{if}} \right) \right] \right) \\ = & \sum_f \frac{wL_f + r_f V_f}{C} \left((1-\rho) \sum_{t=0}^{\infty} \rho^t \mathrm{E}_0 \left[\left(\frac{1-\sum_i \omega_{if}}{\omega_{Vf}} \right) \hat{p}^e_{ft} - \frac{\omega_{Lf}}{\omega_{Vf}} \sum_f \varphi_f \hat{p}^e_{ft} \right] \right) \\ & \quad + \sum_f \frac{wL_f + r_f V_f}{C} \left((1-\rho) \sum_{t=0}^{\infty} \rho^t \mathrm{E}_0 \left[\left(\frac{1-\sum_i \omega_{if}}{\omega_{Vf}} \right) \frac{\hat{A}_{ft}}{1-\sum_i \omega_{if}} - \frac{\omega_{Lf}}{\omega_{Vf}} \sum_f \varphi_f \frac{\hat{A}_{ft}}{1-\sum_i \omega_{if}} \right] \right) \\ = & \sum_f \frac{wL_f + r_f V_f}{C} \left((1-\rho) \sum_{t=0}^{\infty} \rho^t \mathrm{E}_0 \left[\left(\left(\frac{1-\sum_i \omega_{if}}{\omega_{Vf}} \right) - \frac{\omega_{Lf}}{\omega_{Vf}} \sum_f \varphi_f \right) \hat{p}^e_{ft} \right] \right) \\ & \quad + \sum_f \frac{wL_f + r_f V_f}{C} \left((1-\rho) \sum_{t=0}^{\infty} \rho^t \mathrm{E}_0 \left[\left(\left(\frac{1-\sum_i \omega_{if}}{\omega_{Vf}} \right) - \frac{\omega_{Lf}}{\omega_{Vf}} \sum_f \varphi_f \right) \frac{\hat{A}_{ft}}{1-\sum_i \omega_{if}} \right] \right) \\ = & \sum_f \frac{wL_f + r_f V_f}{C} \left(\left(\frac{1-\sum_i \omega_{if}}{\omega_{Vf}} \right) - \frac{\omega_{Lf}}{\omega_{Vf}} \right) \left((1-\rho) \sum_{t=0}^{\infty} \rho^t \mathrm{E}_0 \left[\hat{p}^e_{ft} \right] \right) \\ & \quad + \sum_f \frac{wL_f + r_f V_f}{C} \left(\left(\frac{1-\sum_i \omega_{if}}{\omega_{Vf}} \right) - \frac{\omega_{Lf}}{\omega_{Vf}} \right) \left((1-\rho) \sum_{t=0}^{\infty} \rho^t \mathrm{E}_0 \left[\frac{\hat{A}_{ft}}{1-\sum_i \omega_{if}} \right] \right) \\ = & \sum_f \frac{wL_f + r_f V_f}{C} \left((1-\rho) \sum_{t=0}^{\infty} \rho^t \mathrm{E}_0 \left[\hat{p}^e_{ft} \right] \right) + \sum_f \frac{wL_f + r_f V_f}{C} \left((1-\rho) \sum_{t=0}^{\infty} \rho^t \mathrm{E}_0 \left[\frac{\hat{A}_{ft}}{1-\sum_i \omega_{if}} \right] \right) \end{aligned}$$

where we use the fact that $\sum_f \varphi_f = 1$ to move from second line to the third line, and $\omega_{Vf} = 1 - \sum_i \omega_{if} - \omega_{Lf}$ to move from the third line to the fourth line. We can rewrite this equation as

$$
\begin{aligned}
\mathcal{C}_{\hat{r}} = &\sum_f \frac{wL_f + r_f V_f}{C} \hat{p}^e_{f0} \\
&+ \sum_f \frac{wL_f + r_f V_f}{C} \left(\sum_{t=1}^{\infty} \rho^t \mathrm{E}_0 \left[\hat{p}^e_{ft} - \hat{p}^e_{ft-1} \right] \right) \\
&+ \sum_f \frac{wL_f + r_f V_f}{C} \left((1-\rho) \sum_{t=0}^{\infty} \rho^t \mathrm{E}_0 \left[\frac{\hat{A}_{ft}}{1 - \sum_i \omega_{if}} \right] \right).
\end{aligned}
$$

which proves (23).

B.3 Welfare with Epstein-Zin Preferences

In the main text, we derive an expression for the consumption-equivalent welfare effect of a deviation path for an agent with log utility. We now generalize this expression for a representative agent with Epstein-Zin preferences. The key takeaway of this section is that, when the agent's risk aversion differs from one, the welfare effect depends not only on the effect of the policy on expected log consumption (as in the log utility case) but also on the effect of the policy on higher-order cumulants of log consumption.

We first prove the following lemma which expresses the consumption-equivalent welfare effect in terms of the household's stochastic discount factor for arbitrary preferences.

Lemma 1. *The consumption-equivalent welfare effect of the deviation path $(\hat{C}_t)_{t=0}^{\infty}$ is*

$$
\mathcal{C} = \frac{\sum_{t=0}^{\infty} \mathrm{E}_0 \left[M_{0\to t} C_t \hat{C}_t \right]}{\sum_{t=0}^{\infty} \mathrm{E}_0 \left[M_{0\to t} C_t \right]},
$$

where $M_{0\to t}$ denotes the household's Stochastic Discount Factor (SDF).

Proof. Denote $\mathcal{W}_0$ the welfare of the household at time t. Totally differentiating with respect to the deviation path for consumption $(\hat{C}_t)_{t=0}^{\infty}$ gives:

$$
d\mathcal{W}_0 = \mathrm{E}_0 \left[\sum_{t=0}^{\infty} \frac{\partial \mathcal{W}_0}{\partial C_t} C_t \hat{C}_t \right].
$$

where $\partial \mathcal{W}_0 / \partial C_t$, a stochastic derivative, corresponds to the effect of increasing consumption in states realized at time t for welfare at time 0.

The consumption-metric welfare effect $\mathcal{C}$ is defined as the constant log deviation of consumption that yields the same welfare change; that is

$$
\mathrm{E}_0 \left[\sum_{t=0}^{\infty} \frac{\partial \mathcal{W}_0}{\partial C_t} C_t \mathcal{C} \right] = \mathrm{E}_0 \left[\sum_{t=0}^{\infty} \frac{\partial \mathcal{W}_0}{\partial C_t} C_t \hat{C}_t \right].
$$

Solving for $\mathcal{C}$ gives:

$$
\mathcal{C} = \frac{\mathrm{E}_0 \left[\sum_{t=0}^{\infty} \frac{\partial \mathcal{W}_0}{\partial C_t} C_t \hat{C}_t \right]}{\mathrm{E}_0 \left[\sum_{t=0}^{\infty} \frac{\partial \mathcal{W}_0}{\partial C_t} C_t \right]}.
$$

To conclude, notice that, for any available asset i with return $R_{i,0\to t}$ between 0 and t, an optimizing agent must be indifferent between consuming a bit more today and investing a bit more in asset i between 0 and t, which implies

$$\frac{\partial \mathcal{W}_0}{\partial C_0} = \mathrm{E}_t \left[\frac{\partial \mathcal{W}_0}{\partial C_t} R_{i,0\to t} \right].$$

Hence, $\frac{\partial \mathcal{W}_0/\partial C_t}{\partial \mathcal{W}_0/\partial C_0}$ corresponds to the household's SDF, $M_{0\to t}$, and dividing the numerator and denominator of our expression for $\mathcal{C}$ proves the lemma. □

We now consider the case where the representative agent has Epstein-Zin preferences. Formally, the value function of the agent is defined recursively as follows:

$$\mathcal{W}_t = \left((1-\beta) \frac{C_t^{1-1/\psi}}{1-1/\psi} + \beta \left(\mathrm{E}_t \left[\mathcal{W}_{t+1}^{1-\gamma} \right]^{\frac{1}{1-\gamma}} \right)^{1-1/\psi} \right)^{\frac{1}{1-1/\psi}}.$$

where β is the subjective discount factor (SDR); γ determines the agent's relative risk aversion (RRA); and ψ is the elasticity of intertemporal substitution (EIS). The log utility case discussed in the main text corresponds to $\psi = \gamma = 1$. We also assume that log consumption growth is i.i.d. on the baseline path, which, as proved below, implies that the consumption-to-wealth ratio is constant on the baseline path. If this assumption is not satisfied, the proposition below should be understood as a first-order approximation that is valid as long as the baseline path is close to this balanced growth path.

Proposition 5. *For an agent with arbitrary Epstein-Zin preferences, the consumption-equivalent welfare effect of the deviation path* $(\hat{C}_t)_{t=0}^{\infty}$ *is*

$$\mathcal{C} = (1-\rho) \sum_{t=0}^{\infty} \rho^t \mathrm{E}_0 \left[\frac{C_t^{1-\gamma}}{\mathrm{E}_0 \left[C_t^{1-\gamma} \right]} \hat{C}_t \right],$$

where $\rho \equiv 1 - C_t/W_t$ *denotes the consumption-to-wealth ratio and* γ *denotes the agent's relative risk aversion (RRA).*

Proof. Denote $M_{t\to t+k}$ the household SDF between t and $t+k$ and $W_t = \mathrm{E}_t[\sum_{k=0}^{\infty} M_{t\to t+k} C_{t+k}]$ the PDV of consumption (or, equivalently, total wealth). As shown, for instance, in Martin (2013), a household with Epstein-Zin preferences has an SDF of the form:

$$M_{t\to t+k} = \left(\beta^k \left(\frac{C_{t+k}}{C_t} \right)^{-1/\psi} \right)^{\theta} \left(R_{W,t\to t+k}^{-1} \right)^{1-\theta}, \tag{B1}$$

where $\theta \equiv (1-\gamma)/(1-1/\psi)$ and $R_{W,t+1} \equiv \frac{W_{t+1}}{W_t - C_t}$ denotes the return on the wealth portfolio between t and $t+1$ and $R_{W,t\to t+k} = R_{W,t+1} \dots R_{W,t+k}$ denotes the cumulative return on the wealth portfolio between t and $t+k$. In the special case where $\psi = 1/\gamma$ (separable preferences), equation (B1) gives the familiar expression $M_{t\to t+k} = \beta^k \left(C_{t+k}/C_t \right)^{-\gamma}$.

This expression for the SDF can be simplified when log consumption is i.i.d (which is the case on the baseline path). Indeed, in this case, we can guess (and verify later) that the consumption-to-wealth ratio is constant over time, in which case the return on the wealth portfolio simplifies to:

$$\begin{aligned} R_{W,t+1} &= \frac{W_{t+1}}{W_t - C_t} \\ &= \frac{W_t}{W_t - C_t} \times \frac{W_{t+1}}{W_t} \\ &= \frac{1}{\rho} \frac{C_{t+1}}{C_t}, \end{aligned}$$

where the last line uses the definition of $\rho \equiv 1 - C_t/W_t$. Combining with (B1) allows us to simplify the expression for the SDF along the baseline path:

$$\begin{aligned} M_{t \to t+k} &= \left(\beta^k \left(\frac{C_{t+k}}{C_t} \right)^{-1/\psi} \right)^{\theta} \left(\rho^k \frac{C_t}{C_{t+k}} \right)^{1-\theta} \\ &= \beta^{\theta k} \rho^{(1-\theta)k} \left(\frac{C_{t+k}}{C_t} \right)^{-\gamma}, \end{aligned} \tag{B2}$$

where the second line uses the fact that $\theta(1 - 1/\psi) = (1 - \gamma)$. We now verify that the consumption-to-wealth ratio is indeed constant along the baseline path. Using the definition of total wealth, we get

$$\begin{aligned} W_t &= \mathrm{E}_t \left[\sum_{k=0}^{\infty} M_{t \to t+k} C_{t+k} \right] \\ &= C_t \sum_{k=0}^{\infty} \beta^{\theta k} \rho^{(1-\theta)k} \mathrm{E}_t \left[\left(\frac{C_{t+k}}{C_t} \right)^{1-\gamma} \right] \\ &= C_t \sum_{k=0}^{\infty} \beta^{\theta k} \rho^{(1-\theta)k} \mathrm{E}_t \left[\left(\frac{C_{t+k}}{C_{t+k-1}} \right)^{1-\gamma} \left(\frac{C_{t+k-1}}{C_{t+k-2}} \right)^{1-\gamma} \dots \left(\frac{C_{t+1}}{C_t} \right)^{1-\gamma} \right] \\ &= C_t \sum_{k=0}^{\infty} \beta^{\theta k} \rho^{(1-\theta)k} \mathrm{E}_t \left[\left(\frac{C_{t+k}}{C_{t+k-1}} \right)^{1-\gamma} \right] \mathrm{E}_t \left[\left(\frac{C_{t+k-1}}{C_{t+k-2}} \right)^{1-\gamma} \right] \dots \mathrm{E}_t \left[\left(\frac{C_{t+1}}{C_t} \right)^{1-\gamma} \right] \\ &= C_t \sum_{k=0}^{\infty} \beta^{\theta k} \rho^{(1-\theta)k} \mathrm{E}_0 \left[\left(\frac{C_1}{C_0} \right)^{1-\gamma} \right]^k \\ &= C_t \sum_{k=0}^{\infty} \left(\beta^{\theta} \rho^{1-\theta} \mathrm{E}_0 \left[\left(\frac{C_1}{C_0} \right)^{1-\gamma} \right] \right)^k \\ &= C_t \frac{1}{1 - \beta^{\theta} \rho^{1-\theta} \mathrm{E}_0 \left[\left(\frac{C_1}{C_0} \right)^{1-\gamma} \right]}, \end{aligned}$$

where the fourth and fifth lines use the fact that consumption growth is independently and identically distributed across periods along the baseline path and the last line uses the formula for the infinite sum of a geometric sequence. Hence, we have proven that the wealth-to-consumption ratio W_t/C_t is constant along the baseline path.

Finally, we can combine this equation with the definition of $\rho = 1 - C_t/W_t$ to solve for ρ in terms of the household preferences and of the distribution of consumption growth:

$$\rho = \beta^\theta \rho^{(1-\theta)} \mathrm{E}_0 \left[\left(\frac{C_1}{C_0} \right)^{1-\gamma} \right]$$
$$\implies \rho = \beta \mathrm{E}_0 \left[\left(\frac{C_1}{C_0} \right)^{1-\gamma} \right]^{\frac{1}{\theta}}.$$

Plugging this into (B2) gives a simplified expression for the SDF along the baseline path:

$$M_{0\to t} = \beta^t \left(\frac{C_t}{C_0} \right)^{-\gamma} \mathrm{E}_0 \left[\left(\frac{C_t}{C_0} \right)^{1-\gamma} \right]^{1/\theta - 1}$$
$$= \rho^t \frac{\left(\frac{C_t}{C_0} \right)^{-\gamma}}{\mathrm{E}_0 \left[\left(\frac{C_t}{C_0} \right)^{1-\gamma} \right]}.$$

Combining this formula for the SDF with the expression for the welfare effect $\mathcal{C}$ obtained in Lemma 1 gives:

$$\mathcal{C} = \frac{\sum_{t=0}^{\infty} \mathrm{E}_0 \left[\rho^t \frac{\left(\frac{C_t}{C_0} \right)^{1-\gamma}}{\mathrm{E}_t \left[\left(\frac{C_t}{C_0} \right)^{1-\gamma} \right]} \hat{C}_t \right]}{\sum_{t=0}^{\infty} \mathrm{E}_0 \left[\rho^t \frac{\left(\frac{C_t}{C_0} \right)^{1-\gamma}}{\mathrm{E}_0 \left[\left(\frac{C_t}{C_0} \right)^{1-\gamma} \right]} \right]}$$
$$= (1-\rho) \sum_{t=0}^{\infty} \rho^t \mathrm{E}_0 \left[\frac{\left(\frac{C_t}{C_0} \right)^{1-\gamma}}{\mathrm{E}_0 \left[\left(\frac{C_t}{C_0} \right)^{1-\gamma} \right]} \hat{C}_t \right],$$

where the second line obtains after simplifying the denominator in the first line to $\sum_{t=0}^{\infty} \rho^t = 1/(1-\rho)$. □

This proposition generalizes Proposition 3 stated in the main text, which corresponds to the special case of log utility $\gamma = \psi = 1$. With general Epstein-Zin preferences, the consumption-equivalent welfare effect $\mathcal{C}$ can be expressed as a time-discounted, weighted average of the deviations in log consumption. The first set of weights, $(1-\rho)\rho^t$, adjusts for the agent's discounting over time (they sum to one across time) while the weights $\frac{C_t^{1-\gamma}}{\mathrm{E}_0\left[C_t^{1-\gamma}\right]}$ represent the agent's discounting of different states of nature (they sum up to one across states of nature in a given period).

To better understand the effect of general Epstein-Zin preferences for welfare, note that we can rewrite the consumption-equivalent welfare effect $\mathcal{C}$ as the sum of two terms:

$$\mathcal{C} = (1-\rho)\sum_{t=0}^{\infty}\rho^t \mathrm{E}_0\left[\hat{C}_t\right] + (1-\rho)\sum_{t=1}^{\infty}\rho^t \mathrm{cov}_0\left(\frac{C_t^{1-\gamma}}{\mathrm{E}_0\left[C_t^{1-\gamma}\right]}, \hat{C}_t\right). \tag{B3}$$

The first term corresponds to the welfare effect for an agent with log utility (the one discussed in Proposition 3). The second term corresponds to the normalized covariance of $C_t^{1-\gamma}$ and changes in log consumption. This second term is zero if $\gamma = 1$ (e.g., log utility) or if deviations in log consumption are independent of the realization of consumption along the baseline path. The following corollary expresses this second term as the sum of deviations in the higher-order cumulants of log consumption.

Corollary 1. *For an agent with arbitrary Epstein-Zin preferences, the consumption-equivalent welfare effect of the deviation path* $(\hat{C}_t)_{t=0}^{\infty}$ *is*

$$\begin{aligned}\mathcal{C} =& (1-\rho)\sum_{t=0}^{\infty}\rho^t \mathrm{E}_0\left[\hat{C}_t\right] \\ &+ \frac{1-\gamma}{2}\sum_{t=1}^{\infty}(1-\rho)\rho^t d\left(\mathrm{Var}_0 \ln C_t]\right) \\ &+ \frac{(1-\gamma)^2}{3!}\sum_{t=1}^{\infty}(1-\rho)\rho^t d\left(\mathit{Skewness}_t[\ln C_t]\cdot \mathrm{Var}_0[\ln C_t]^{3/2}\right) \\ &+ \frac{(1-\gamma)^3}{4!}\sum_{t=1}^{\infty}(1-\rho)\rho^t d\left(\mathit{Excess\ Kurtosis}_0[\ln C_t]\cdot \mathrm{Var}_0[\ln C_t]^{2}\right) \\ &+ \ldots\end{aligned}$$

When the representative agent has a risk aversion different from one, the consumption-equivalent welfare effect depends not only on the change in expected log average consumption, but also on the change in the higher-order cumulants of log consumption, such as its variance, skewness, and kurtosis. In particular, if $\gamma > 1$, the representative agent is more risk averse than log utility and dislikes increases in even cumulants of log consumption (e.g., variance or kurtosis) while enjoying increases in odd cumulants (e.g., skewness). The converse is true if $\gamma < 1$. One implication is that, if agents have greater risk aversion (i.e., $\gamma > 1$), and if tariffs increase the even cumulants of log consumption (like variance) or decrease odd cumulants (like skewness), then our baseline welfare effect, which corresponds to the first-term in on the right-hand side, will underestimate the full welfare loss.

Proof. First, note that one can rewrite the expression for welfare given in Proposition 3 as:

$$\mathcal{C} = (1-\rho)\sum_{t=0}^{\infty}\rho^t \frac{d\ln \mathrm{E}_0\left[C_t^{1-\gamma}\right]}{1-\gamma}.$$

The *cumulant-generating function* (CGF) of a random variable g is defined as the function $\theta \to \ln \mathrm{E}\left[e^{\theta g}\right]$. It is well known that the CGF can be expanded as a power series in θ:

$$\ln \mathrm{E}\left[e^{\theta g}\right] = \sum_{l=1}^{\infty} \frac{\theta^l}{l!} \kappa_l,$$

where κ_l corresponds to the the l-th *cumulant* of the variable g. In particular, the first cumulant corresponds to the mean of g and the second cumulant corresponds to its variance. Applying this definition with $g = \ln C_t$ and $\theta = 1 - \gamma$ gives:

$$\ln \mathrm{E}_0\left[C_t^{1-\gamma}\right] = \sum_{l=1}^{\infty} \frac{(1-\gamma)^l}{l!} \kappa_{l,0\to t},$$

where $\kappa_{l,0\to t}$ denotes the l-th cumulant of log consumption at time t from the point of view of time 0. Combining the last two equations gives:

$$\begin{aligned}
\mathcal{C} &= (1-\rho) \sum_{t=0}^{\infty} \rho^t \frac{1}{1-\gamma} \sum_{l=1}^{\infty} \frac{(1-\gamma)^l}{l!} d\kappa_{l,0\to t} \\
&= (1-\rho) \sum_{t=0}^{\infty} \rho^t d\kappa_{1,0\to t} + (1-\rho) \sum_{t=0}^{\infty} \rho^t \frac{1}{1-\gamma} \sum_{l=2}^{\infty} \frac{(1-\gamma)^l}{l!} d\kappa_{l,0\to t} \\
&= (1-\rho) \sum_{t=0}^{\infty} \rho^t \mathrm{E}_0\left[\hat{C}_t\right] + (1-\rho) \sum_{t=1}^{\infty} \rho^k \sum_{l\geq 2} \frac{(1-\gamma)^{l-1}}{l!} d\kappa_{l,0\to t},
\end{aligned}$$

where the last line uses the fact that the deviation of the average log consumption (its first cumulant) can be written as the average deviation of log consumption. To conclude, simply replace the first four cumulants using the definition of variance, skewness, and excess kurtosis. □

C Data and Measurement

C.1 Event Dates

The following table presents the event dates (i.e., the date of the first news report of each increase in tariffs), the date that new tariffs were implemented, the country imposing the tariffs, and the news link of each event. The earliest event date was identified via Factiva and Google Search.

Table C.1: Details on Event Dates

Event Date	Implementation Date	Country	News Link
23jan2018*	07feb2018	US	Washington Post
01mar2018*	23mar2018	US	Reuters
22mar2018	06jul2018	US	NYT
23mar2018	02apr2018	China	CNBC
15jun2018	06jul2018	China	NPR
19jun2018	24sep2018	US	WSJ
02aug2018	24sep2018	China	Reuters
06may2019**	15jun2019	US	DW
13may2019	01jun2019	China	CNBC
01aug2019	01sep2019	US	CNBC
23aug2019	01sep2019	China	CNBC

Note: Event dates with the first news release on a weekday after trading hours (4:00 PM EST) are flagged by an asterisk (*). Event dates with the first news release on a weekend are flagged by two asterisks (**). In these instances, the trading day for the event is the first trading day after the news release, which is listed as the event date in the table.

C.2 Summary of Data Sources

Table C.2: Summary of Data Sources

Variable	Construction
Book Leverage	*Source: CRSP-Compustat Annual Merged Dataset (2017)* Book leverage is total debt including current [**dt**] *divided by* assets (total) [**at**], **dt**/**at**.
Cash Flow to Asset Ratio	*Source: CRSP-Compustat Annual Merged Dataset (2017)* The Cash Flow-to-Asset Ratio is operating income after depreciation [**oiadp**] *plus* interest and related expense (total) [**xintq**] *all divided by* assets (total) [**at**]; (**oiadp** + **xintq**)/**at**.

Variable	Construction
China Revenue Share	*Source: FactSet Geographic Revenue Exposure (2017)* These data report revenue shares from major markets (including China) for 3,134 firms (identified by PERMNO). If we cannot match a firm to this dataset, we try to match using tickers. If we cannot match a firm using either PEMRNO or the ticker to one in the Datamyne dataset, we assume that its China revenue share is zero. More details are provided in Section C.3.
China Importer/ Exporter	*Source: Datamyne dataset of the value and quantity of exports to and imports from China (via sea) by U.S. firms in 2017, Supply chain data from Capital IQ* We combine the Datamyne dataset with supply chain data to determine whether each firm imported from or exported to China (via sea) in 2017 either directly or through a subsidiary/supplier. Refer to Section C.3 for details on variable construction.

Variable	Construction
Economic Surprise Variables (ES_t)	*Source: Daniel Lewis based on Lewis et al. (2019)* The difference between a macroeconomic data release value and the Bloomberg median of economists' forecast on the previous day. The 65 series we use to construct our economic surprise variables are ISM manufacturing, ISM non-manufacturing, ISM prices, construction spending, durable goods new orders, factory orders, initial jobless claims, ADP payroll employment, non-farm payrolls, unemployment rate, total job openings, consumer credit, non-farm productivity, unit labor costs, retail sales, retail sales less auto, federal budget balance, trade balance, import price index, building permits, housing starts, industrial production, capacity utilization, business inventories, Michigan consumer sentiment, PPI core, PPI, CPI core, CPI, Empire State manufacturing index, Philadelphia Fed BOS, GDP (advance estimate), GDP (second estimate), GDP price index, personal income, personal spending, PCE price index, core PCE price index, wholesale inventories, new home sales, CB consumer confidence, leading economic index, employment cost index, Wards total vehicle sales, continuing claims retail sales ex auto and gas, NAHB housing market index, change in manufacturing payrolls, MNI Chicago, PMI pending home sales, Richmond Fed manufacturing index, Dallas Fed manufacturing index, existing home sales, Chicago Fed national activity index, capital goods (non-defense ex air), NFIB small business optimal index, Cap goods ship. ex air, KC Fed manufacturing activity, Markit U.S. manufacturing purchasing managers index, Case-Shiller home price index, and Markit U.S. services purchasing managers index, federal funds shock, forward guidance shock, asset purchase shock, and the Federal Reserve information shock.
Equity-Premium Bound (EPB$_t$)	*Source: OptionMetrics, dataset with prices of actively traded option on the S&P 500 (ticker SPX)* We follow Martin (2017) method for constructing EPB_t.

Variable	Construction
Firm	*Source: CRSP-Compustat Annual Merged Dataset (2017)* A firm is defined by its Compustat Global Company Key or GVKEY. In our sample, the GVKEY codes map one-to-one to the unique identifier and permanent identifier to security or PERMNO in CRSP. As such, we are able to use PERMNO (**`permno`**) and GVKEY (**`gvkey`**) interchangeably across datasets.
Firm Employment L_f	*Source: CRSP-Compustat Annual Merged Dataset (2017)* The employment variable in Compustat [**`emp`**] includes the following items: all part-time and seasonal employees; and all employees of consolidated subsidiaries, both domestic and foreign. The employment variable excludes consultants, contract workers, and employees of unconsolidated subsidiaries.
Firm Returns ($\ln R_{ft}$)	*Source: CRSP U.S. Stock Database* We define log firm returns as the *log* of one *plus* net returns [**`ret`**]; $\ln(1 + \texttt{ret})$.
Labor and Specific Factor Shares (θ_{Lf} and θ_{Vf})	*Source: Compustat and BEA Input-Output table* Firm cash flow as a share of revenue is calculated by dividing accounting cash flows with gross sales [**`sale`**] in 2017, obtained from Compustat. We use the BEA's 450-by-450 industry (6-digit NAICS) IO table in 2012 to construct labor and materials shares of revenue. In Section C.3, we describe how we combine all of these shares to construct the labor and specific factor shares of value added (θ_{Lf} and θ_{Vf}).

Variable	Construction
Ratio Between Market Value of Equity and Market Value of Assets κ_f	*Source: CRSP-Compustat Annual Merged Dataset (2017)* κ_f is defined as the ratio between the market value of equity and the market value of total assets (equity + debt). The market value of equity (or market capitalization) is defined below. The market value of assets is the sum of the market value of equity and the value of debt, constructed as total assets [**at**] *minus* stockholder equity [**seq**] *minus* cash and short-term investments [**che**]; **at** − **seq** − **che**. If cash and short-term investments is missing, we replace it with zero. Finally, we winsorize κ_f to be between 0.1 and 1.0.
Market Value of Equity	*Source: CRSP-Compustat Annual Merged Dataset (2017)* We use the 2017 Market Value of Equity of a firm is [**mkval**]. When this variable is unavailable we use the *product of* annual price close (fiscal) [**prcc_f**] *and* common shares outstanding [**csho**]; **prcc_f** × **csho**.
Profit	*Source: CRSP-Compustat Annual Merged Dataset (2017)* Profit is "operating income after depreciation" [**oiadp**] *minus* "interest and related expense (total)" [**xint**]; **oiadp** − **xint**.
Property, Plant, and Equipment (PPE) per worker	*Source: CRSP-Compustat Annual Merged Dataset (2017)* PPE per worker is property, plant, and equipment (gross total) [**ppegt**] *divided by* employees [**emp**]; **ppegt**/**emp**.

Variable	Construction
Treasury Yield (1- to 30-Month Maturity)	**1. Maturity: 3, 4, and 12 months** *Source: Board of Governors of the Federal Reserve System, {3-Month, 6-Month, 1-Year} Treasury Bill Secondary Market Rate, Discount Basis; retrieved from FRED, Federal Reserve Bank of St. Louis* We obtain the nominal yields with the following maturities from FRED: 3-Month [**DTB3**], 6-Month [**DTB6**], and 12-Month [**DTB1YR**]. **2. Maturity: all remaining maturities up to 30 months** *Source: daily US yield curve data up to 2019 dataset from Gürkaynak et al. (2007); dataset retrieved from Refet Gürkaynak's website* The US yield curve dataset was published alongside Gürkaynak et al. (2007) and is updated regularly. At the time of writing, the dataset reports nominal and real yields up until October 25, 2019, at different monthly maturities ranging from one to thirty months. Nominal yields in the paper refers to "Zero-Coupon Yield (Continuously Compounded)" [**SVNY**xx].
Real Yields (1- to 30-Month Maturity)	*Source: daily US TIPS curve data up to 2019 dataset from Gürkaynak et al. (2010); dataset retrieved from Refet Gürkaynak's website* The US yield curve dataset was published alongside Gürkaynak et al. (2010) and is updated regularly (data up to 10/25/2019). Real yields is "TIPS Yield Zero Coupon (Continuously Compounded)" [**TIPSY**xx].
Tobin's Q	*Source: CRSP-Compustat Annual Merged Dataset (2017)* Tobin's Q is market capitalization *plus* book value of total assets [**at**] *minus* book value of common equity [**ceq**], *all divided* by the book value of total assets [**at**].
U.S. Import Value	*Source: U.S. Census Bureau* We obtain 2017 U.S. import values for each good (HTS10) and exporting country from the U.S. Census Bureau.

Variable	Construction
U.S. Tariff Rates	*Source: U.S. Trade Representative (USTR), and U.S. International Trade Commission (USITC).* In the paper, the tariff rate in year y for an HS10 product and exporting country refers to the tariff rate in effect in December of year y. We use the December 2017 and 2019 tariff rates applied to each product (HTS10) and exporting country.
U.S. Firm-size Distribution (Goods and Services)	*Source: U.S. Census Bureau, "Number of Firms, Number of Establishments, Employment, and Annual Payroll by Small/Large Enterprise Employment Sizes for the United States and States, NAICS Sectors: 2017" dataset* The dataset reports reports the number of employees by sector (NAICS2) and employment bin.

C.3 Construction of China-Exposure Variables

We consider three ways in which firms were exposed to China: importing, exporting, and foreign sales (either through exporting or subsidiaries). It is important to capture indirect imports that are ultimately purchased by U.S. firms because many firms do not import directly from China but instead obtain Chinese inputs through their subsidiaries or the U.S. subsidiaries of foreign firms. In order to identify the supply chains, we use DUNS numbers from Dun & Bradstreet to merge importers from Datamyne with a list of firms and their subsidiaries from Capital IQ. We use a firm-name match to link firms, subsidiaries, and their suppliers that are reported in Datamyne, Compustat, Bloomberg, and FactSet and identify which firms are trading with China directly or indirectly through their network of suppliers. After matching firms with identical names in two or more datasets, we manually compared firms with similar names to identify whether they are matches. We define "China Revenue Share" to be the share of a firm's revenues in 2017 (either obtained through sales of subsidiaries or exports) that arise from sales in China, as reported in FactSet.

The Datamyne data used to identify U.S. firms that import from China or export to China have a number of limitations. First, the product level reported is more aggregated than that in the Harmonized Tariff System 8-digit level at which U.S. tariffs are set. While some of the Datamyne data are at the Harmonized System (HS) 6-digit level, much of it is at the far more aggregated HS2-digit level, making it impossible to know what share of a firm's trade was affected by tariffs. We, therefore, use a binary exposure measure. Our "China Import" dummy is one if the firm or its supply network imported from China in 2017 and zero otherwise. We also construct a "China Export" dummy analogously for exports. Second, the Datamyne data only cover seaborne trade. The U.S. Census data reveal that in 2017, 62 percent of all imports from China and 58 percent of exports to China were conducted by sea. So although we capture over half of the value of U.S.-China trade, the China import and export dummies are likely to miss some U.S. firms that trade with China. On the export side, any exporters that are not reflected in the export dummy are included in the China revenue share variable.

China Revenue Share The China revenue share variable is from FactSet. There are two potential issues we note. First, firms sometimes report geographic revenue shares for more aggregated geographies than countries (e.g., Asia/Pacific). In these cases, FactSet imputes the undisclosed revenue share for a country using that country's GDP weight within a more aggregate geographic unit for which the data are disclosed (e.g., China's GDP share within Asia/Pacific region). FactSet provides a confidence factor that ranges from 0.5 to 1, with 1 indicating no imputation. Fortunately, within our sample of firms, the mean confidence factor for the China revenue share is 0.996 with a range of 0.98 to 1, and our China revenue share variable comes mostly from direct disclosures.

Table C.4: Descriptive Statistics

	N	Mean	SD	p25	p50	p75
Ratio of Equity to Total Assets κ	3,463	0.65	0.30	0.43	0.71	0.94
China Importer Dummy	2,437	0.31	0.46	0.00	0.00	1.00
China Exporter Dummy	2,437	0.04	0.20	0.00	0.00	0.00
China Revenue Share	2,437	0.03	0.07	0.00	0.00	0.02

Note: The China Importer and China Exporter dummies equal 1 for firms that import or export to China. China Revenue Share is the share of a firm's revenues that come from China.

D Details on Reweighting the Compustat-CRSP Sample

We now detail how we reweight the sample of firms in our Compustat-CRSP sample to approximate the distribution of firms in the U.S. across sectors and employment size. We first describe the method used in our baseline results, which uses a non-parametric approach. We then describe an alternative method, used as a robustness exercise, that uses a more parametric approach with a finer employment grid.

D.1 Baseline Method

We start by dividing the set of firms in our sample into 18 industries (defined by their first 2-digit NAICS code) and four employment bins (0-500, 501-5,000, 5,001-20,000, 20,001+). For the 2-digit NAICS industries 11 (agriculture), 61 (education), 62 (health care), and 81 (other services), we only use two employment bins, below or above 20000, to ensure that there are enough firms within each bin.

We compute the average deviation in firm value in sector s and employment bin b for event j as:

$$\hat{\Pi}^j_{sb0} \equiv \sum_{f' \in \Omega_{sbj}} \frac{L_f}{\sum_{f' \in \Omega_{sbj}} L_{f'}} \Pi^j_{f0}.$$

where Ω_{sbj} denotes the set of firms in industry sector s and employment bin b with a non-missing return on event j and Π_{f0}^{j} denotes the change in firm value over the day in which event j happens. We then compute the overall deviation in firm value in sector s and employment bin b as the sum of the average deviation on all tariff-announcement days j in our sample

$$\hat{\Pi}_{sb0} \equiv \sum_{j=1}^{J} \hat{\Pi}_{sb0}^{j}.$$

The average deviation in firm value in sector s is given by

$$\hat{\Pi}_{s0} \equiv \sum_{b \in \Omega_s^B} \frac{L_{sb}}{\sum_{b' \in \Omega_s^B} L_{sb'}} \hat{\Pi}_{sb0},$$

where Ω_s^B is the set of employment bins b in sector s and L_{sb} denotes the overall employment in bin b and sector s in the U.S. economy, provided by the Statistics of U.S. Businesses (SUSB, U.S. Census Bureau). As a final step, we compute the overall deviation in firm value for the whole economy as

$$\hat{\Pi}_{0} \equiv \sum_{s \in \Omega^S} \frac{VA_s}{C} \hat{\Pi}_{s0},$$

where Ω^S denotes the set of sectors, VA_s is the value added of sector s and C is personal consumption expenditures, all obtained from the BEA.

D.2 Alternative Method

Under this alternative methodology, we divide the set of firms in our sample into 18 industries (defined by their first 2-digit NAICS code) and a finer grid of ten employment bins (defined by nine employment thresholds 500, 750, 1000, 1500, 2000, 2500, 5000, 10000, and 20000). With this finer employment grid, some {sector s, employment bin b, announcement j} cells have zero or very few firms. To handle this issue, we first regress, within each event and sector, the deviation in firm value on log employment and log employment squared. We then use the predicted values from this regression to construct the average deviation in firm value for each {sector s, employment bin b, announcement j} cell. The final step is similar to the previous method: we obtain the overall deviation in firm value in the economy by taking an employment-weighted average within each sector, and then a value-added weighted average across sectors.

E Details on Estimating Changes in Discount Rates

E.1 Stylized Facts

In Table 1, we reported stock-market returns event-by-event. In the same spirit. Appendix Table E.1 reports the change in nominal yields, real yields, and in the equity-premium bound event-by-event. This shows that our results are not driven by some outlier event: almost all announcements tend to decrease real yields and increase the equity-premium bound.

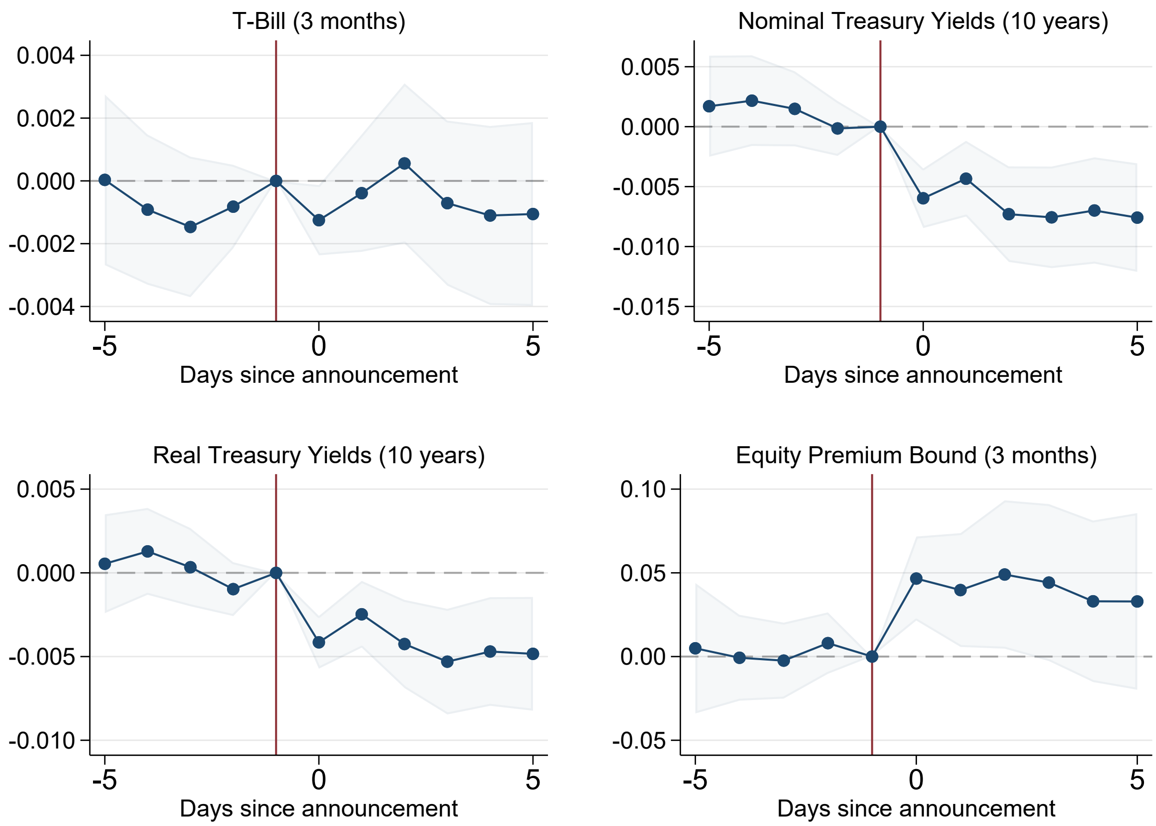
Table E.1: Change in Discount Rates on Tariff-Announcement Days

Event Date	Δ T-Bill (3m) (x100)	Δ Nominal Yields (10y) (x100)	Δ Real Yields (10y) (x100)	Δ EPB (12m) (x100)
23jan2018	-0.01	-0.03	-0.03	0.02
01mar2018	-0.03	-0.06	-0.04	0.23
22mar2018	-0.02	-0.07	-0.05	0.35
23mar2018	0.02	-0.00	0.00	0.29
15jun2018	0.00	-0.01	-0.02	0.07
19jun2018	0.00	-0.03	-0.03	0.10
02aug2018	-0.01	-0.02	-0.01	-0.04
06may2019	0.01	-0.03	-0.03	0.11
13may2019	-0.02	-0.07	-0.04	0.29
01aug2019	-0.01	-0.13	-0.05	0.12
23aug2019	-0.03	-0.09	-0.08	0.45
Cumulative	-0.10	-0.54	-0.36	1.98

Note: The table reports the daily change in each variable on each announcement day. We obtain the daily yield-to-maturity on 3-month T-Bill from FRED, the daily nominal and real yield-to-maturity on 10-year Treasuries from Gürkaynak et al. (2007), and the daily equity-premium bound from OptionMetrics, using the methodology of Martin (2017).

In Figure 1, we reported the dynamic effect of announcements on stock-market returns over a five-day window. In the same spirit, Appendix Figure E.1 reports the dynamic effect of announcements on the change in nominal yields, real yields, and the equity-premium bound over a five-day window. This figure shows that the change in these variables is concentrated on the days of the announcements, which supports the notion that a one-day window is long enough to capture the overall effect of announcements.

Figure E.1: The Dynamics of Discount Rates around Tariff Announcements



Note: This figure plots the cumulative change in each variable from the day before the announcement. Formally, we estimate the following regression on all trading days between 2017 and 2019: $\Delta Y_t = \alpha + \sum_{s=-4}^{5} \beta_s D_{s,t} + \sum_{d=1}^{D} \gamma_d \times ES_{d,t} + \epsilon_t$, where $D_{s,t} = 1$ if day t is s days after an announcement ; $D_{s,t} = 0$ otherwise and $ES_{d,t}$denotes the surprise in macroeconomic releases. We then plot the cumulative change in Y_t from the eve of the announcement to the horizon s as $11 \sum_{k=s+1}^{-1} \hat{\beta}_k$ if $s < -1$ and $11 \sum_{k=0}^{s} \hat{\beta}_k$ if $s > -1$. Shaded areas correspond to the 95 percent confidence interval computed using robust standard errors.

E.2 VAR

We now describe more precisely how we construct the set of variables used in the VAR discussed in (19). The log risk-free rate $\ln R_{\text{risk-free,t}}$, corresponds to the annualized yield of 3-month T-Bills (`DTB3` in FRED) minus the growth of the CPI price index (`CPIAUCSL` in FRED) in the previous year. The excess market return $\ln R_{EM,t}$ corresponds to the log return of CRSP value-weighted stock market minus the risk-free rate implied by the yield of 3-month T-Bills. The term spread TS is the annualized yield-to-maturity of ten-year treasuries (`SVENY10` in Gürkaynak et al. (2007)) minus the annualized yield of 3-month T-Bills. The equity-premium bound corresponds to the annualized equity premium for the 3-month horizon constructed using the methodology of Martin (2017), using data from OptionMetrics. The value spread, VS, is the log difference in log book-to-market value between the top 10 percent and the bottom 10 percent of firms ranked by book to market equity, constructed using data from Fama-French library. The credit spread, CS, is the difference between the yield of BAA bonds, from Moody's Seasoned Baa Corporate Bond Yield, and the log risk-free rate. The log price-dividend ratio, $\ln PD$, is the logarithm of a smoothed average price-dividend ratio, constructed as the dividends distributed by the value-weighted CRSP portfolio in the past year divided by its current price. In some robustness tests, we also add the return of the small-minus-big portfolio SMB (i.e., a portfolio of long small firms and short big firms) and the return of the high-minus-low portfolio HML (i.e., a portfolio of long high book-to-market equity and short low book-to-market equity) from Fama-French data library.

Table E.2: Effect of Tariff Announcements on VAR variables (One-Day Window)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	$\log R_{\text{risk-free}}$	$\log R_{EM}$	TS	EPB	VS	CS	$\log PD$	SMB	HML
Event	-0.000**	-0.125***	-0.005***	0.046***	0.092***	-0.001***	-0.127***	0.016	-0.041**
	(0.000)	(0.040)	(0.001)	(0.013)	(0.030)	(0.000)	(0.039)	(0.015)	(0.017)
N	753	754	753	753	753	753	753	754	754

Note: The table reports the sum of β_j in the regression (22). The sample includes all trading days from 2017 to 2019. Robust standard errors in parentheses.

Table E.3: Effect of Tariff Announcements on VAR variables (Three-Day Window)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	$\log R_{\text{risk-free}}$	$\log R_{EM}$	TS	EPB	VS	CS	$\log PD$	SMB	HML
Event	-0.000	-0.112*	-0.003	0.039	0.051	-0.000	-0.130**	0.027	-0.023
	(0.000)	(0.066)	(0.002)	(0.024)	(0.048)	(0.000)	(0.066)	(0.031)	(0.029)
N	753	754	753	753	753	753	753	754	754

Note: The table reports the sum of β_j in the regression (22), using three-day windows around announcement. The sample includes all trading days from 2017 to 2019. Robust standard errors in parentheses.

Table E.4: Robustness Exercises for Changes in Future Discount Rates

Specification	Deviations in Discount Rates $\rho\boldsymbol{B}(I-\rho\boldsymbol{B})^{-1}d\boldsymbol{x}_0$			
	Risk-free Rate	Excess Returns	SMB	HML
	$\sum \rho^t \mathrm{E}_0\left[\hat{R}_{\text{risk-free},t}\right]$	$\sum \rho^t \mathrm{E}_0\left[\hat{R}_{EM,t}\right]$	$\sum \rho^t \mathrm{E}_0\left[\hat{R}_{SMB,t}\right]$	$\sum \rho^t \mathrm{E}_0\left[\hat{R}_{HML,t}\right]$
Baseline	-0.021	0.089		
Without TS	-0.017	0.090		
Without EPB	-0.013	0.083		
Without VS	0.003	0.076		
Without CS	-0.008	0.084		
Without $\log PD$	-0.023	0.047		
FF 3-Factor Model	-0.009	0.074	0.026	0.006
3-Days Window	-0.005	0.088		

Note: The table reports $\rho\boldsymbol{B}(I-\rho\boldsymbol{B})^{-1}d\boldsymbol{x}_0$, where $\boldsymbol{x}_0$ is reported in Table E.2 (using a one-day window) and Table E.3 (using a three-day window).

E.3 Robustness to Using a Factor Model for Firm Discount Rates

In the baseline results, we made the simplifying assumption that the log deviation in the interest rate paid on firm debt was the same as the log deviation in the risk-free rate and that the deviation in the required return on firm equity was given by its beta exposure to the stock market times the deviation in the expected excess return on the market (CAPM). For robustness, we also experiment with relaxing these two assumptions.

First, we use the Fama-French 3-factor model instead of the CAPM to estimate the discount rate on firm equity. This effectively allows the discount rate of a firm equity to depend not only on its exposure to the stock market (as in the CAPM) but also on its size and book-to-market values. More precisely, we replace the second equation in (17) by

$$\mathrm{E}_0\left[\hat{R}^E_{ft}\right] = \mathrm{E}_0\left[\hat{R}_{\text{risk-free},t}\right] + \beta_{f,M}\mathrm{E}_0\left[\hat{R}_{M,t} - \hat{R}_{\text{risk-free},t}\right] + \beta_{f,SMB}\mathrm{E}_0\left[\hat{R}_{SMB,t}\right] + \beta_{f,HML}\mathrm{E}_0\left[\hat{R}_{HML,t}\right],$$

where SMB denotes the portfolio of small minus big firms while HML denotes the portfolio of high minus low book-to-market values and the set of betas $(\beta_{f,M},\beta_{f,SMB},\beta_{f,HML})$ is obtained as the slope coefficients in a multivariate regression of firm excess returns on $\left(\hat{R}_{M,t} - \hat{R}_{\text{risk-free},t}\right)$, $\hat{R}_{SMB,t}$, and $\hat{R}_{HML,t}$. Combining this equation with (16) implies the following equation for the deviation in firm discount rates:

$$\underbrace{\sum_{t=1}^{\infty}\rho^t\mathrm{E}_0\left[\hat{R}_{ft}\right]}_{\substack{\text{Deviation in firm } f \\ \text{discount rates}}} = \underbrace{\sum_{t=1}^{\infty}\rho^t\mathrm{E}_0\left[\hat{R}_{\text{risk-free},t}\right]}_{\substack{\text{Deviation in future} \\ \text{risk-free rates}}} + \kappa_f\beta_{f,M}\underbrace{\sum_{t=1}^{\infty}\rho^t\mathrm{E}_0\left[\hat{R}_{M,t} - \hat{R}_{\text{risk-free},t}\right]}_{\substack{\text{Deviation in future} \\ \text{excess stock market returns}}} \tag{E1}$$

$$+ \kappa_f\beta_{f,SMB}\underbrace{\sum_{t=1}^{\infty}\rho^t\mathrm{E}_0\left[\hat{R}_{SMB,t}\right]}_{\substack{\text{Deviation in future} \\ \text{SMB returns}}} + \kappa_f\beta_{f,HML}\underbrace{\sum_{t=1}^{\infty}\rho^t\mathrm{E}_0\left[\hat{R}_{HML,t}\right]}_{\substack{\text{Deviation in future} \\ \text{HML returns}}}.$$

We then use a VAR that includes the return of SMB and HML portfolios, $R_{SMB,t}$ and $R_{HML,t}$, to jointly estimate the deviation in future risk-free rates, future excess stock-market returns, future expected SMB returns, and future expected HML returns. As reported in Table E.4, we find that tariff announcements slightly increase the expected return of the SMB portfolio; that is, tariff announcements have a larger effect on the discount rate of small firms relative to big firms.

This implies that, relative to the CAPM, our Fama-French 3-factor model returns an estimate for firm-level discount rates that is higher for small firms (firms with $\beta_{f,SMB} > 0$) and lower for big firms (firms with $\beta_{f,SMB} < 0$). These changes would average out if we were doing a value-weighted average of firms in our sample. However, because we overweight smaller firms, this leads to a lower aggregate deviation in firm discount rates by 1.1 percentage points. As a result, the overall decline in welfare is mechanically reduced by 1.1 percentage points.

Second, we assume that the log deviation in the interest rate paid on firm debt is equal to the log deviation in the yields of BAA bonds rather than the risk-free rate on debt; that is, we replace the first equation in (17) by

$$\mathrm{E}_0\left[\hat{R}^D_{ft}\right] = \mathrm{E}_0\left[\hat{R}_{\text{risk-free},t}\right] + \mathrm{E}_0\left[\widehat{CS}_t\right],$$

where CS_t denotes the credit spread (the difference between the yield on BAA bonds and the risk-free rate). In terms of methodology, this means that we need to augment our measure of the deviation in future risk-free rates by the deviation in future credit spread, as estimated by the VAR. As reported in Table 8, we find that our measure of welfare hardly changes; that is, our VAR estimates relatively little deviation in credit spread following announcement shocks.

F Additional Tables

Table F.1: Effect of Tariff Announcements on the Components of Cash Flow and Stock Returns

	Deviation in ...					
	Discount-Rate	Asset-Value	logR	Discount-Rate	Asset-Value	logR
	(1)	(2)	(3)	(4)	(5)	(6)
China Importer	0.38***	-2.35***	-2.59***	0.26***	-0.70***	-0.30
	(0.10)	(0.28)	(0.35)	(0.07)	(0.22)	(0.28)
China Exporter	-0.47***	-0.70	-2.01***	-0.31***	0.34	-0.36
	(0.17)	(0.49)	(0.72)	(0.11)	(0.38)	(0.60)
China Revenue Share	6.57***	-12.09***	-10.22***	4.40***	-9.36***	-7.43***
	(1.14)	(2.22)	(2.23)	(0.77)	(2.00)	(2.01)
N	26,807	26,807	26,807	26,807	26,807	26,807
Events	U.S.	U.S.	U.S.	China	China	China

Note: All dependent variables are multiplied by 100. A firm f's deviation discount rate on trading day t corresponds to the term $\sum_{t=1}^{\infty} \rho^t \mathrm{E}_0[\hat{R}_{ft}]$ in the theory section. A firm's asset value on a trading day t is market value plus debt. The deviation in a firm f's cash flow on the day t, denoted by $\hat{r}_{ft}$, is the sum of its deviation in the discount rate and deviation in asset value. This table uses a one-day window around each event, enforces a balanced panel of firms, and drops firms in the financial sector. China Importer is a dummy that equals one if the firm or any of its subsidiaries or suppliers import from China. China Exporter is a dummy that equals one if the firm or subsidiaries export to China. China Revenue Share is the share of the firm's revenue from China, reported in percentage points. Columns 1-3 presents the sum of the coefficients across each of the U.S. event days; and columns 4-6 are the sum of the coefficients across each of the China event dates. Standard errors are in parenthesis. Asterisks correspond to the following levels of significance: $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.1$.

Table F.2: Relationship between Changes in Returns and Future Observables (with Controls Reported)

	(1) $\ln(\text{Profit}_{ft})$	(2) $\ln(\text{L}_{ft})$	(3) $\ln(\text{Sales}_{ft})$	(4) $\ln(\text{Sales/L})_{ft}$
Post × ln R_f	0.23***	0.07***	0.12***	0.04**
	(0.04)	(0.01)	(0.02)	(0.02)
Post × PPE per Worker_f	-0.00	-0.00	-0.00	0.00
	(0.02)	(0.01)	(0.01)	(0.01)
Post × $\ln(\text{Mkt. Val. of Equity}_f)$	0.02	-0.01	0.03***	0.03***
	(0.02)	(0.01)	(0.01)	(0.01)
Post × $\frac{\text{Cash Flows}}{\text{Assets}}_f$	-0.39***	0.02***	-0.08***	-0.09***
	(0.03)	(0.01)	(0.01)	(0.01)
Post × Book Leverage_f	0.05***	-0.03***	-0.02**	0.01
	(0.02)	(0.01)	(0.01)	(0.01)
Post × Tobin's Q_f	0.08***	0.07***	0.08***	0.00
	(0.02)	(0.01)	(0.01)	(0.01)
Firm FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
R^2	0.915	0.976	0.962	0.873
Observations	11940	17032	16760	16736

Note: Data is at the firm-annual level for the period 2013 to 2021, from Compustat and CRSP. Profit is defined as operating income after depreciation less interest and related expenses. We follow Greenland et al. (2024)'s specification in defining $\ln R_f$ as the log of one plus the average return on 5 days surrounding the tariff-announcement dates across all event dates in 2017-2019; however, instead of using abnormal returns, we just simply use the actual return. In this table, $\ln R_f$ is then multiplied by 100. The Post dummy takes a value of one in 2019, 2020, and 2021. All columns include the following control variables at the start of the sample (i.e., 2013) interacted with the Post dummy as covariates: Property, Plant, and Equipment (PPE) per worker, market capitalization, cash-flow-to-asset ratio, book leverage and Tobin's Q. The controls are winsorized at the 1 percent level and then demeaned and divided by their standard deviation. See Appendix C.2 for details on variable constructions. Standard errors are in parenthesis. $^{***}p < 0.01,^{**} p < 0.05,^{*} p < 0.1$.

G Measuring the Static and Dynamic Price Effects

In this section, we describe how we compute the effective rate of protection, in order to calculate the first two terms in (23).

G.1 Construction of Industry-level Tariffs

The first step is to construct the log change in the tariff on outputs in each 6-digit NAICS industry $j \in J$. We begin with the U.S. statutory tariff rates τ_{hct} at the HTS10 h - country c level in year-month t. We compute the log change in the output tariff for each industry j as the import-value weighted average of log changes in the HTS10-country level tariff rates, using fixed annual 2017 import value weights:

$$\hat{\tau}_j \equiv \sum_{h \in H_j} \sum_{c} \frac{mv_{hc,2017}}{\sum_{h' \in H_j} \sum_{c'} mv_{h'c',2017}} \Delta \ln(1 + \tau_{hc}), \tag{G1}$$

where H_j is the set of HTS10 codes that map to NAICS 6-digit industry j; $mv_{hc,2017}$ is the annual import value of goods in HTS10 code h imported from country c in 2017; and

$\Delta \ln(1+\tau_{hc}) = \ln(1+\tau_{hc,2019Dec}) - \ln(1+\tau_{hc,2017Dec})$ is the log-change in ad-valorem tariff rates from December 2017 to December 2019. Thus, the change in output tariff $\hat{\tau}_j$ captures the average change in tariff rates applied to imported goods produced in industry j.

We compute the tariffs in a counterfactual exercise in which the U.S. applies additional tariff rates of 60 percentage points on imports from China and 20 percentage points on imports from all other countries as

$$\hat{\tau}^a_j \equiv \sum_{h \in H_j} \sum_c \frac{mv_{hc,2017}}{\sum_{h' \in H_j} \sum_{c'} mv_{h'c',2017}} \Delta \ln(1+\tau^a_{hc}), \tag{G2}$$

where $\Delta \ln(1+\tau^a_{hc}) = \ln(1+\tau_{hc,2017Dec}+0.6) - \ln(1+\tau_{hc,2017Dec})$ if $c = \text{China}$, and $\Delta \ln(1+\tau^a_{hc}) = \ln(1+\tau_{hc,2017Dec}+0.2) - \ln(1+\tau_{hc,2017Dec})$ otherwise.

G.2 Effective Rates of Protection Calculation

We use equation (5) to estimate how U.S. import tariff changes map into firm-level ERP ($\hat{p}^e_{f0}$) in a static model. Since firm-level intermediate-input use data are not available, we use industry-level data, i.e., we assume that the shift in the ERP for all firms in industry j is given by

$$\hat{p}^e_j = \frac{\hat{p}^\tau_j - \sum_{i \in J} \omega_{ij} \hat{q}^\tau_i}{1 - \sum_{i \in J} \omega_{ij}}, \tag{G3}$$

where $\hat{p}^\tau_j$ are estimates of how U.S. import tariff changes affected prices of U.S. outputs in industry j, and $\hat{q}^\tau_i$ are estimates of how U.S. import tariff changes affected input prices i. The ω_{ij}'s denote the cost-share of intermediate input i used in the production of output in industry j.[2] We assign industry-level changes in ERP to each firm based on the industry it produces, i.e., $\hat{p}^e_{f0} = \hat{p}^e_j \quad \forall f \in j$.

Calculating ERP is challenging because it requires many assumptions about pass-through from tariffs into domestic prices in a world with complex input-output linkages. We estimate the ERP in two ways.

Lower Bound Tariff Effect: First, we obtain a lower bound for the static price effect by assuming that output prices do not change when tariffs are applied, i.e., $\hat{p}^\tau_j = 0$, and the input price, $\hat{q}^\tau_i$, is equal to the change in the tariffs on imported inputs. The input price assumption is based on the findings in Amiti et al. (2019) and Fajgelbaum et al. (2020). They estimated passthrough of U.S. tariffs on U.S import prices and the impact of Chinese tariffs on U.S. export prices. Both studies find 100 percent passthrough of tariffs into tariff-inclusive import prices. In this scenario, $\hat{p}^\tau_j$ is set equal to zero, and the ERP is calculated as follows:

$$\hat{p}^{e1}_j = \frac{-\sum_{i \in J} \omega_{ij} \lambda_i \hat{\tau}_i}{1 - \sum_{i \in J} \omega_{ij}}. \tag{G4}$$

We use the 2017 IO table to identify all of the inputs i used to produce output j. We set $\hat{q}^\tau_i$ equal to $\lambda_i \hat{\tau}_i$ in equation G3, where λ_i is the share of imports of input i in total absorption of input i (where absorption is calculated as production less exports plus imports). We multiply the cost share of each intermediate input i used to produce output j (ω_{ij}) by λ_i

[2] Total output is calculated as the sum of total intermediate input cost, compensation of employees, and gross operating surplus in the BEA's IO Table from 2017.

so that the tariff change is only applied to imported inputs and not to domestic inputs. The price of the imported input increases by the full amount of the tariff $\hat{\tau}_i$ (calculated in equation (G1)). Note that the tariffs on inputs are at the BEA IO level, which is a little more aggregated than NAICS 6-digit. Using this calculation of ERP, we assign the same value to each firm within a NAICS 6-digit industry in our Compustat sample, and reweight the industries to reflect the distribution of firms in the aggregate economy as we did in our baseline welfare calculations and described in Section D.

Upper Bound Tariff Effect: In our second specification, we assume that higher import prices also raise U.S. output prices, so that $\hat{p}_j^{\tau} > 0$. Specifically, we set

$$\hat{p}_j^{e2} = \frac{\gamma\lambda_j\hat{\tau}_j - \sum_{i\in J}\omega_{ij}\left[\lambda_i\hat{\tau}_i + (1-\lambda_i)\left(\gamma\lambda_i\hat{\tau}_i\right)\right]}{1-\sum_{i\in J}\omega_{ij}}. \tag{G5}$$

In this calculation, we allow for prices of domestic input i to also increase when there is an increase in tariffs on input i. The amount we adjust domestic input prices is based on the estimates in Table 4 of Amiti et al. (2019), which found that domestic prices increased by $\gamma\lambda_i$ with $\gamma = 0.4$. i.e. $\hat{p}_j^{\tau} = \gamma\lambda_j\hat{\tau}_j$. Total input prices, therefore, rise by the sum of the the direct tariff effect on the share of imported intermediates in the industry $\lambda_i\hat{\tau}_i$ plus the share of domestically sourced intermediate inputs multiplied by the increase in tariffs due to higher domestic prices $(1-\lambda_i)\left(\gamma\lambda_i\hat{\tau}_i\right)$.

Estimating the Static Price Effect: We use tariff changes between 2017 and 2019 to assign these industry-level changes in ERP to firms in our sample and then use the reweighting scheme in Section D. We use equation (G4) to obtain an estimate for the welfare impact equal to -0.3 of a percent for the static price effect in equation (23). Our upper bound estimate of the uses equation (G5) to compute the ERP and produces an estimate of the welfare impact given in equation (23) of -0.17%.

Estimating the Lower Bound the Dynamic Price Effect: We assume that the worst case scenario for future ERP is a tariff scheme in which the U.S. applies additional tariff rates of 60 percentage points against China and 20 percentage points against all other countries. We denote these tariffs by $\hat{\tau}_j^{a}$. Using these hypothetical output tariffs to calculate the changes in ERP in equation (G4), the resulting static price effect is -2.19%. If we instead use equation (G5) to calculate the changes in ERP, the resulting static price effect is -1.01%

H Treatment Effects

In this section, we provide more details of the estimation of the treatment effects. To estimate the size of the treatment effect, we use an event study, where we project firm-level deviations in cash flow on a set of our three firm-level characteristics associated with China exposure (importer dummy, exporter dummy, as well as Chinese revenue shares), allowing for different coefficients for each announcement day and each exposure type.

$$\mathrm{CF}_{ft} \equiv \sum_{t=0}^{\infty}(1-\rho)\rho^t \mathrm{E}_0\left[\hat{r}_{ft}\right] = \alpha_t + \sum_j\sum_i \gamma_{ij}Z_{if}D_{jt} + \epsilon_{ft}, \tag{H1}$$

where the left-hand side variable is the expected present discounted value of firm cash flow, which can be measured using Proposition 4, estimated using the method described in Sections 4.2 and 4.3; α_t is a day fixed effect; D_{jt} is a dummy variable that is one if day t is the same as announcement day j; $Z_{if} \in$ {Importer, Exporter, China Revenue Share} is a measure of firm f's exposure to China; γ_{ij} is parameter to be estimated; and ϵ_{ft} is an i.i.d. error term.

Table H.1: Impact of U.S. Tariff Announcements on Cash Flows

	(1) Cumulative	(2) 23Jan18	(3) 1Mar18	(4) 22Mar18	(5) 19Jun18	(6) 06May19	(7) 01Aug19
China Importer	-1.97***	-0.25***	-0.33***	-0.27***	-0.12	-0.52***	-0.47***
	(0.26)	(0.07)	(0.11)	(0.08)	(0.10)	(0.07)	(0.14)
China Exporter	-1.17***	-0.19**	0.15	-0.23**	-0.43***	-0.19*	-0.27
	(0.41)	(0.08)	(0.16)	(0.10)	(0.11)	(0.11)	(0.28)
China Revenue Share	-5.52***	-0.57*	-2.55***	-1.23***	-1.62***	-2.30***	2.74**
	(1.77)	(0.34)	(0.73)	(0.40)	(0.42)	(0.44)	(1.19)

Note: The dependent variable is residualized cash flow (CF_{ft}) multiplied by 100, which is constructed by summing $\hat{\Pi}_{f0}$ (constructed using equation (15)) and the change in the discount rate (which is based on the change in the VAR variables on announcement days after controlling for economic surprises). This table uses a one-day window around each event. China Importer is a dummy that equals one if the firm or any of its subsidiaries or suppliers import from China. China Exporter is a dummy that equals one if the firm or subsidiaries export to China. China Revenue Share is the share of the firm's revenue from China. Column 1 reports the sum of the coefficients across each of the U.S. event days. There are 26,807 observations. Standard errors are in parenthesis. Asterisks correspond to the following levels of significance: $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.1$.

Table H.1 presents the results for each of the six U.S. tariff events, and Table H.2 presents the estimated coefficients from the same regression for the five Chinese tariff retaliation events. The estimated coefficients under each event date correspond to the $\hat{\gamma}_{ij}$ in equation (H1). Thus, all event dates in both tables are estimated jointly in one regression. The coefficients should be interpreted as the effect of the announcement on the expected cash flows of exposed firms relative to unexposed firms. For example, the coefficient of -0.33 on the China importer dummy in column 3 of Table H.1 implies that on the March 1, 2018 steel and aluminum announcement day, firms that imported from China experienced declines in their expected cash flows that were on average 0.33 percentage points lower than other firms. The numbers in column 1 provide our estimate of the cumulative impact over all U.S. events and all days in the event windows ($\sum_j \hat{\gamma}_{ij}$). We can see from the first column of this table that the cumulative impact of the U.S. announcements was to lower the expected cash flows of U.S. importers by 1.97 percentage points relative to firms that did not import from China. Similarly, the relative fall in expected cash flows of exporters were 1.17 percentage points more than those of non-exporters, and firm's selling in China saw their expected cash flows fall by 0.06 percentage points for every percentage point of revenue share they obtained from China. The coefficient on China Revenue Share implies that a firm with the average sales exposure to China (three percent of revenue) experienced a fall in expected cash flow of 0.18 percentage points lower than a firm with no sales in China across all of the U.S. events.

The cumulative impact of the U.S. events, shown in the first column of Table H.1, indicates that in general U.S. tariff announcements had large, negative, and significant impacts on the cash flows of importers, exporters, and firms selling in China. Although the effects are not precisely measured for every event and measure of exposure, 16 of the 18 event-day coefficients are negative, which indicates that U.S. tariff announcements typically had negative effects on the expected cash flows of firms exposed to China relative to unexposed firms. When we sum across all events, the cumulative effect is negative and significant for each type of exposure.

Interestingly, U.S. tariff announcements caused expected cash flows to decline not only for importing firms but also for firms exporting or selling in China more generally. These negative coefficients on the exporter or sales variables are likely due to three (not mutually exclusive) reasons. The first is that markets may have anticipated that U.S. tariffs would provoke Chinese retaliatory tariffs, thereby lowering the abnormal return of exporters. Second, market participants may have anticipated that U.S. tariffs would also provoke Chinese retaliatory non-tariff barriers that could lower revenues obtained by exporting or multinational sales. Third, it is also possible that U.S. tariffs weakened the Chinese economy, which could lower expected profits for U.S. firms selling there.

Table H.2: Impact of Chinese Tariff Announcements on Cash Flows

	(1) Cumulative	(2) 23Mar18	(3) 15Jun18	(4) 02Aug18	(5) 13May19	(6) 23Aug19
China Importer	-0.45**	0.02	-0.02	0.21*	-0.28***	-0.37***
	(0.20)	(0.08)	(0.07)	(0.11)	(0.09)	(0.08)
China Exporter	0.03	0.16	-0.05	-0.49***	0.36***	0.05
	(0.30)	(0.10)	(0.11)	(0.15)	(0.13)	(0.13)
China Revenue Share	-4.95***	-0.85	-0.23	1.26	-4.06***	-1.08***
	(1.49)	(0.60)	(0.36)	(0.78)	(0.75)	(0.36)

Note: The dependent variable is residualized cash flow (CF_{ft}) multiplied by 100, which is constructed by summing $\hat{\Pi}_{f0}$ (constructed using equation (15)) and the change in the discount rate (which is based on the change in the VAR variables on announcement days after controlling for economic surprises). This table uses a one-day window around each event. China Importer is a dummy that equals one if the firm or any of its subsidiaries or suppliers import from China. China Exporter is a dummy that equals one if the firm or subsidiaries export to China. China Revenue Share is the share of the firm's revenue from China. Column 1 reports the sum of the coefficients across each of the Chinese event days. There are 26,807 observations. Standard errors are in parenthesis. Asterisks correspond to the following levels of significance: $^{***}p < 0.01,^{**} p < 0.05,^{*} p < 0.1$.

Turning to the Chinese announcements, column 1 of Table H.2 shows that Chinese retaliation on average significantly lowered expected cash flows for firms selling in China (either by exporting or through multinationals). We do not see an effect on exporting per se, but this result may reflect the fact that export revenues are captured in the China Revenue Share variable so we may have a multicollinearity problem. Interestingly, we see that tariff announcements also lowered expected cash flows of firms importing from China, perhaps because of the tit-for-tat retaliation structure of the trade war in which Chinese retaliation provoked more U.S. tariffs. Overall, Chinese retaliation announcements led to a significant 0.45 percentage point drop in the expected cash flows of firms importing from China and another 0.05 percentage point drop for every percentage point increase in a firm's sales in China. The results are economically significant as well. Since

Bernard et al. (2007) found that 79 percent of U.S. importers also export, it is worth considering the impact of tariff announcements on a firm exposed to China through multiple channels. We estimate that a firm that imported from and exported to China and obtained 3 percent of its revenue from sales to China would have had its expected cash flows lowered by 3.9 percent when we sum across all event days. The large magnitude of this result suggests that the tariff announcement had a sizable negative impact on the expected cash flows of exposed firms.[3]

[3] Appendix Table F reports the cumulative effect for the tariff-announcement effects on firm values, discount rates, and stock prices.