Online appendix (not for publication) "Judicial quality, input customisation, and trade margins: the role of product quality"

Xiaomin Cui[1], Miaojie Yu[2], and Rui Zhang[3]

1 Appendix A: Theory

1.1 Proof of Lemma 1

For each variety $\omega \in [0,1]$, there is perfect competition among producers from different exporter countries, so the representative consumer in d sources ω from the exporter that offers the lowest price *per quality unit*:

$$P_d(\omega) = \min_o \{P_{do}(\omega);\ \forall\, o\}.$$

where $P_{do}(\omega) = \tau_{do} \cdot B_o \cdot \delta_o^{-\eta\phi} \cdot \varphi_o(\omega)^{-\phi}$. We assume that productivity of variety ω in export country o, $\varphi_o(\omega)$, follows Fréchet distribution:

$$\Pr[\varphi_o(\omega) \leq \varphi] = G_o(\varphi) = \exp\left(-T_o \cdot \varphi^{-\theta}\right) \tag{A.1}$$

We first solve the probability distribution of $P_{do}(\omega)$, the distribution of price *per quality unit* available for importer d from exporter o:

$$G_{do}(P) = \Pr[P_{do}(\omega) \leq P] = 1 - G_o((\frac{\tau_{do} \cdot B_o}{P})^{\frac{1}{\phi}} \delta_o^{-\eta}) = 1 - \exp[-T_o \cdot \delta_o^{\eta\theta} \cdot (\frac{B_o \cdot \tau_{do}}{P})^{-\frac{\theta}{\phi}}]$$

The probability distribution of $P_d(\omega)$, the actual price distribution in importer d, is:

$$\begin{aligned} G_d(P) =& \Pr[P_d(\omega) \leq P] = 1 - \Pi_s[1 - G_{ds}(P)] \\ =& 1 - \Pi_s[\exp[-T_s \cdot \delta_s^{\eta\theta} \cdot (\frac{B_s \cdot \tau_{ds}}{P})^{-\frac{\theta}{\phi}}]] \\ =& 1 - \exp[-P^{\frac{\theta}{\phi}} \cdot \sum_s T_s \cdot \delta_s^{\eta\theta} \cdot (B_s \cdot \tau_{ds})^{-\frac{\theta}{\phi}}] \\ =& 1 - \exp[-\Phi_d \cdot P^{\frac{\theta}{\phi}}], \end{aligned}$$

where $\Phi_d \equiv \sum_s T_s \cdot \delta_s^{\eta\theta} \cdot (B_s \cdot \tau_{ds})^{-\frac{\theta}{\phi}}$ summarises importer d's access to the global technology weighted by the inverse of sourcing cost from different exporters, including input cost, service cost, trade costs, and contracting environment.

The probability of d's sourcing a particular variety from o, π_{do}, follows a gravity form as in Eaton and Kortum (2002):

$$\begin{aligned} \pi_{do} &= \Pr[P_{do}(\omega) \leq P_{ds}(\omega);\ \forall\ s \neq o] \\ &= \int_0^\infty \Pi_{s \neq o}[1 - G_{ds}(P)] dG_{do}(P) \\ &= \frac{T_o \cdot \delta_o^{\eta\theta} \cdot (B_o \cdot \tau_{do})^{-\frac{\theta}{\phi}}}{\Phi_d} \cdot \int_0^\infty \exp[-\Phi_d \cdot P^{\frac{\theta}{\phi}}] d(\Phi_d \cdot P^{\frac{\theta}{\phi}}) \\ &= \frac{T_o \cdot \delta_o^{\eta\theta} \cdot (B_o \cdot \tau_{do})^{-\frac{\theta}{\phi}}}{\Phi_d} = \frac{T_o \cdot \delta_o^{\eta\theta} \cdot (w_o \cdot \tau_{do})^{-\frac{\theta}{\phi}}}{\sum_s T_s \cdot \delta_s^{\eta\theta} \cdot (w_s \cdot \tau_{ds})^{-\frac{\theta}{\phi}}}. \end{aligned} \tag{A.2}$$

Note that $B_o \equiv \left(\frac{1}{\phi}\right)^{\phi}\left(\frac{1}{1-\phi}\right)^{1-\phi} w_o$. Therefore, the sourcing probability is increasing in absolute advantage T_o and decreasing in trade costs τ_{do}, costs of making products B_o, and contract enforcement costs δ_o.

1.2 Proof of Proposition 1

We investigate in the probability distribution of price *per quality unit* among varieties that d actually buys from o:

$$\begin{aligned}
\tilde{G}_{do}(P) &= \Pr\left[P_{do}(\omega) \leq P \mid P_{do}(\omega) \leq P_{ds}(\omega);\ \forall\, s \neq o\right] \\
&= \frac{\Pr\left[P_{do}(\omega) \leq P, P_{do}(\omega) \leq P_{ds}(\omega);\ \forall\, s \neq o\right]}{\Pr\left[P_{do}(\omega) \leq P_{ds}(\omega);\ \forall\, s \neq o\right]} \\
&= \frac{\int_0^P \Pi_{s\neq o}[1 - G_{ds}(q)]dG_{do}(q)}{\pi_{do}} \\
&= \frac{1}{\pi_{do}} \cdot \frac{T_o \cdot \delta_o^{\eta\theta} \cdot (B_o \cdot \tau_{do})^{-\frac{\theta}{\phi}}}{\Phi_d} \cdot \int_0^P \exp\left[-\Phi_d \cdot q^{\frac{\theta}{\phi}}\right] d(\Phi_d \cdot q^{\frac{\theta}{\phi}}) \\
&= 1 - \exp\left[-\Phi_d \cdot P^{\frac{\theta}{\phi}}\right] = G_d(P).
\end{aligned} \tag{A.3}$$

Intuitively, the price distribution of varieties that d sources from o coincides with the price distribution of all varieties consumed in d, a non-arbitrage condition arising from a Ricardian model with perfect competition.

Because $\tilde{G}_{do}(P) = G_d(P)$ is constant across exporters o for a given importer d, the value of trade flow from o to d is therefore proportional to the sourcing probability π_{do}. Thus bilateral trade flow in value is:

$$X_{do} = \pi_{do} \cdot X_d = T_o \cdot \delta_o^{\eta\theta} \cdot (B_o \cdot \tau_{do})^{-\frac{\theta}{\phi}} \cdot \Phi_d^{-1} \cdot X_d. \tag{A.4}$$

The exact price index in d is straightforward to solve:

$$
\begin{aligned}
\Psi_d^{1-\sigma} &= \int_0^1 P_d(\omega)^{1-\sigma} d\omega = E[P_d(\omega)^{1-\sigma}] \\
&= \int_0^\infty P^{1-\sigma} \exp{[-\Phi_d \cdot P^{\frac{\theta}{\phi}}]} d(\Phi_d \cdot P^{\frac{\theta}{\phi}}) \\
&= \Phi_d^{\frac{\phi(\sigma-1)}{\theta}} \cdot \int_0^\infty \frac{(\Phi_d \cdot P^{\frac{\theta}{\phi}})^{\frac{\phi(1-\sigma)}{\theta}}}{\exp{[\Phi_d \cdot P^{\frac{\theta}{\phi}}]}} d(\Phi_d \cdot P^{\frac{\theta}{\phi}}) \\
&= \Phi_d^{\frac{\phi(\sigma-1)}{\theta}} \cdot \int_0^\infty \frac{t^{\frac{\phi(1-\sigma)}{\theta}}}{\exp{(t)}} dt = \Phi_d^{\frac{\phi(\sigma-1)}{\theta}} \cdot \Gamma[1 + \frac{\phi(1-\sigma)}{\theta}].
\end{aligned}
$$

where $\Gamma(\cdot)$ is the Gamma function. Therefore:

$$
\Psi_d = \Phi_d^{-\frac{\phi}{\theta}} \cdot \Gamma[1 + \frac{\phi(1-\sigma)}{\theta}]^{\frac{1}{1-\sigma}}. \tag{A.5}
$$

An importer with better access to global technology Φ_d thus enjoys a lower price index.

1.3 Proof of Lemma 2

To compute the price of bilateral trade from o to d, we also need the bilateral trade value X_{do} and quantity q_{do}. From the CES demand function we have:

$$
X_{do}(\omega) = P_{do}(\omega)^{1-\sigma} \cdot \Psi_d^{\sigma-1} \cdot X_d = \tau_{do}^{1-\sigma} \cdot B_o^{1-\sigma} \cdot \delta_o^{\eta\phi(\sigma-1)} \cdot \varphi_o(\omega)^{\phi(\sigma-1)} \cdot \Psi_d^{\sigma-1} \cdot X_d
$$

and

$$
\begin{aligned}
&q_{do}(\omega) = P_{do}(\omega)^{-\sigma} \cdot \Psi_d^{\sigma-1} \cdot X_d \cdot z_{do}(\omega)^{-1} \\
=&(1-\phi)^{\frac{1}{1-\chi}} \cdot \tau_{do}^{-\sigma} \cdot B_o^{-\sigma+\frac{1}{1-\chi}} \cdot \delta_o^{\eta(\phi\sigma-\frac{1}{\alpha-\chi})} \cdot \varphi_o(\omega)^{\phi\sigma-\frac{1}{\alpha-\chi}} \cdot t_o^{-\frac{1}{1-\chi}} \cdot \Psi_d^{\sigma-1} \cdot X_d.
\end{aligned}
$$

The price of trade from o to d can be directly computed:

$$p_{do} \equiv \frac{X_{do}}{q_{do}} = \frac{\tau_{do}^{1-\sigma} B_o^{1-\sigma} \delta_o^{\eta\phi(\sigma-1)} \Psi_d^{\sigma-1} X_d [\int_{\omega\in\Omega_{do}} \varphi_o(\omega)^{\phi(\sigma-1)} d\omega]}{(1-\phi)^{\frac{1}{1-\chi}} \tau_{do}^{-\sigma} B_o^{-\sigma+\frac{1}{1-\chi}} \delta_o^{\eta(\phi\sigma-\frac{1}{\alpha-\chi})} t_o^{-\frac{1}{1-\chi}} \Psi_d^{\sigma-1} X_d [\int_{\omega\in\Omega_{do}} \varphi_o(\omega)^{\phi\sigma-\frac{1}{\alpha-\chi}} d\omega]}$$
$$= \tau_{do} \cdot \Big(\frac{t_o}{1-\phi}\Big)^{\frac{1}{1-\chi}} \cdot B_o^{-\frac{\chi}{1-\chi}} \cdot \delta_o^{\frac{\eta\chi}{\alpha-\chi}} \cdot \Big[\frac{\int_{\omega\in\Omega_{do}} \varphi_o(\omega)^{\phi(\sigma-1)} d\omega}{\int_{\omega\in\Omega_{do}} \varphi_o(\omega)^{\phi\sigma-\frac{1}{\alpha-\chi}} d\omega}\Big]$$
$$= \tau_{do} \cdot \Big(\frac{t_o}{1-\phi}\Big)^{\frac{1}{1-\chi}} \cdot B_o^{-\frac{\chi}{1-\chi}} \cdot \delta_o^{\frac{\eta\chi}{\alpha-\chi}} \cdot \frac{E[\varphi_o(\omega)^{\phi(\sigma-1)} \mid \omega \in \Omega_{do}]}{E[\varphi_o(\omega)^{\phi\sigma-\frac{1}{\alpha-\chi}} \mid \omega \in \Omega_{do}]}. \tag{A.6}$$

Next, we solve the probability distribution of $\varphi_o(\omega)$ among varieties in d that are served by o, $\tilde{G}_{do}(\varphi)$:

$$\tilde{G}_{do}(\varphi) = \Pr[\varphi_o(\omega) \le \varphi \mid P_{do}(\omega) \le P_{ds}(\omega);\ \forall\, s \ne o]$$
$$= \frac{\Pr\Big[\varphi_s(\omega) \le \varphi_o(\omega)\Big(\frac{\delta_s^{-\eta\phi}\cdot B_s\cdot\tau_{ds}}{\delta_o^{-\eta\phi}\cdot B_o\cdot\tau_{do}}\Big)^{\frac{1}{\phi}} \le \varphi\Big(\frac{\delta_s^{-\eta\phi}\cdot B_s\cdot\tau_{ds}}{\delta_o^{-\eta\phi}\cdot B_o\cdot\tau_{do}}\Big)^{\frac{1}{\phi}};\ \forall\, s\ne o\Big]}{\Pr[P_{do}(\omega) \le P_{ds}(\omega);\ \forall\, s \ne o]}$$
$$= \frac{\int_0^\varphi \Pi_{s\ne o} G_{ds}\big(x\big(\frac{\delta_s^{-\eta\phi}\cdot B_s\cdot\tau_{ds}}{\delta_o^{-\eta\phi}\cdot B_o\cdot\tau_{do}}\big)^{\frac{1}{\phi}}\big) dG_{do}(x)}{\pi_{do}}$$
$$= \frac{1}{\pi_{do}} \cdot \int_0^\varphi \Pi_{s\ne o} \exp\Big[-T_s \cdot \Big(x\Big(\frac{\delta_s^{-\eta\phi}\cdot B_s\cdot\tau_{ds}}{\delta_o^{-\eta\phi}\cdot B_o\cdot\tau_{do}}\Big)^{\frac{1}{\phi}}\Big)^{-\theta}\Big] d\exp(-T_o\cdot x^{-\theta})$$
$$= \frac{1}{\pi_{do}} \cdot \int_0^\varphi \exp\Big[-x^{-\theta}\cdot \frac{\Phi_d}{\delta_o^{\eta\theta}\cdot(B_o\cdot\tau_{do})^{-\frac{\theta}{\phi}}}\Big] d(-T_o\cdot x^{-\theta})$$
$$= \int_0^\varphi \exp\Big[-\frac{\Phi_d}{\delta_o^{\eta\theta}\cdot(B_o\cdot\tau_{do})^{-\frac{\theta}{\phi}}}\cdot x^{-\theta}\Big] d\Big(-\frac{\Phi_d}{\delta_o^{\eta\theta}\cdot(B_o\cdot\tau_{do})^{-\frac{\theta}{\phi}}}\cdot x^{-\theta}\Big)$$
$$= \exp\Big[-\frac{\Phi_d}{\delta_o^{\eta\theta}\cdot(B_o\cdot\tau_{do})^{-\frac{\theta}{\phi}}}\cdot \varphi^{-\theta}\Big] = \exp\Big[-\frac{T_o}{\pi_{do}}\cdot\varphi^{-\theta}\Big].$$

For any power function of $\varphi_o(\omega)$, the conditional expectation of $\varphi_o(\omega)^a$ is:

$$
\begin{aligned}
E[\varphi_o(\omega)^a \mid \omega \in \Omega_{do}] = \int_0^\infty \varphi^a d\tilde{G}_{do}(\varphi) = \int_0^\infty \frac{\varphi^a}{\exp\left[\frac{T_o}{\pi_{do}} \cdot \varphi^{-\theta}\right]} d\left[-\frac{T_o}{\pi_{do}} \cdot \varphi^{-\theta}\right] \\
= -\left(\frac{T_o}{\pi_{do}}\right)^{\frac{a}{\theta}} \cdot \int_0^\infty \frac{\left(\frac{T_o}{\pi_{do}} \cdot \varphi^{-\theta}\right)^{-\frac{a}{\theta}}}{\exp\left[\frac{T_o}{\pi_{do}} \cdot \varphi^{-\theta}\right]} d\left[\frac{T_o}{\pi_{do}} \cdot \varphi^{-\theta}\right] \\
= \left(\frac{T_o}{\pi_{do}}\right)^{\frac{a}{\theta}} \cdot \int_0^\infty \frac{t^{-\frac{a}{\theta}}}{\exp(t)} dt = \left(\frac{T_o}{\pi_{do}}\right)^{\frac{a}{\theta}} \cdot \Gamma\left(1 - \frac{a}{\theta}\right).
\end{aligned}
$$

The ratio of conditional expectations characterising the composition effect is:

$$
\begin{aligned}
&\frac{E[\varphi_o(\omega)^{\phi(\sigma-1)} \mid \omega \in \Omega_{do}]}{E[\varphi_o(\omega)^{\phi\sigma - \frac{1}{\alpha-\chi}} \mid \omega \in \Omega_{do}]} = \frac{\left(\frac{T_o}{\pi_{do}}\right)^{\frac{\phi(\sigma-1)}{\theta}} \cdot \Gamma\left(1 - \frac{\phi(\sigma-1)}{\theta}\right)}{\left(\frac{T_o}{\pi_{do}}\right)^{\frac{\phi\sigma - \frac{1}{\alpha-\chi}}{\theta}} \cdot \Gamma\left(1 - \frac{\phi\sigma - \frac{1}{\alpha-\chi}}{\theta}\right)} \\
&= \left(\frac{T_o}{\pi_{do}}\right)^{\frac{\chi}{\theta(\alpha-\chi)}} \cdot \frac{\Gamma\left(1 - \frac{\phi(\sigma-1)}{\theta}\right)}{\Gamma\left(1 - \frac{\phi\sigma - \frac{1}{\alpha-\chi}}{\theta}\right)} = \left(\frac{\Phi_d}{\delta_o^{\eta\theta} \cdot (B_o \cdot \tau_{do})^{-\frac{\theta}{\phi}}}\right)^{\frac{\chi}{\theta(\alpha-\chi)}} \cdot \frac{\Gamma\left(1 - \frac{\phi(\sigma-1)}{\theta}\right)}{\Gamma\left(1 - \frac{\phi\sigma - \frac{1}{\alpha-\chi}}{\theta}\right)} \qquad (A.7) \\
&= \Phi_d^{\frac{\chi}{\theta(\alpha-\chi)}} \cdot \tau_{do}^{\frac{\chi}{1-\chi}} \cdot B_o^{\frac{\chi}{1-\chi}} \cdot \delta_o^{-\frac{\eta\chi}{\alpha-\chi}} \cdot \Gamma^p
\end{aligned}
$$

where $\Gamma^p = \Gamma\left(1 - \frac{\phi(\sigma-1)}{\theta}\right) / \Gamma\left(1 - \frac{\phi\sigma - \frac{1}{\alpha-\chi}}{\theta}\right)$.

Therefore, by combining (A.6) and (A.7), we obtain the price of trade from o to d:

$$
\begin{aligned}
p_{do} &= \tau_{do} \cdot \left(\frac{t_o}{1-\phi}\right)^{\frac{1}{1-\chi}} \cdot B_o^{-\frac{\chi}{1-\chi}} \cdot \delta_o^{\frac{\eta\chi}{\alpha-\chi}} \cdot \Phi_d^{\frac{\chi}{\theta(\alpha-\chi)}} \cdot \tau_{do}^{\frac{\chi}{1-\chi}} \cdot B_o^{\frac{\chi}{1-\chi}} \cdot \delta_o^{-\frac{\eta\chi}{\alpha-\chi}} \cdot \Gamma^p \\
&= \left(\tau_{do} \cdot \frac{t_o}{1-\phi}\right)^{\frac{1}{1-\chi}} \cdot \Phi_d^{\frac{\chi}{\theta(\alpha-\chi)}} \cdot \Gamma^p = \left(\tau_{do} \cdot \frac{w_o}{1-\phi}\right)^{\frac{1}{1-\chi}} \cdot \Phi_d^{\frac{\chi}{\theta(\alpha-\chi)}} \cdot \Gamma^p.
\end{aligned} \qquad (A.8)
$$

Define the average price *per quality unit* of trade from o to d as P_{do}:

$$
\begin{aligned}
P_{do} \equiv &E[P_{do}(\omega) \mid \omega \in \Omega_{do}] = \int_0^\infty P d\tilde{G}_{do}(P) \\
= &\Phi_d^{-\frac{\phi}{\theta}} \cdot \int_0^\infty \frac{(\Phi_d \cdot P^{\frac{\theta}{\phi}})^{\frac{\phi}{\theta}}}{\exp[\Phi_d \cdot P^{\frac{\theta}{\phi}}]} d(\Phi_d \cdot P^{\frac{\theta}{\phi}}) = \Phi_d^{-\frac{\phi}{\theta}} \cdot \Gamma\left[1 + \frac{\phi}{\theta}\right] \propto \Psi_d.
\end{aligned}
$$

We can therefore define the average quality of aggregate trade from o to d, z_{do}:

$$\begin{aligned} z_{do} \equiv \frac{p_{do}}{P_{do}} &= \Phi_d^{\frac{1}{\theta(\alpha-\chi)}} \cdot \left(\frac{t_o}{1-\phi} \cdot \tau_{do}\right)^{\frac{1}{1-\chi}} \cdot \frac{\Gamma^p}{\Gamma[1+\frac{\phi}{\theta}]} \\ &= \Phi_d^{\frac{1}{\theta(\alpha-\chi)}} \cdot \left(\frac{w_o}{1-\phi} \cdot \tau_{do}\right)^{\frac{1}{1-\chi}} \cdot \frac{\Gamma^p}{\Gamma[1+\frac{\phi}{\theta}]}. \end{aligned} \tag{A.9}$$

1.4 Proof of Proposition 2

To prove Proposition 2, note that

$$\pi_{do} = \frac{T_o \cdot \delta_o^{\eta\theta} \cdot (B_o \cdot \tau_{do})^{-\frac{\theta}{\phi}}}{\Phi_d} = \frac{T_o \cdot \delta_o^{\eta\theta} \cdot (w_o \cdot \tau_{do})^{-\frac{\theta}{\phi}}}{\sum_s T_s \cdot \delta_s^{\eta\theta} \cdot (w_s \cdot \tau_{ds})^{-\frac{\theta}{\phi}}}. \tag{A.10}$$

Note that $B_o \equiv \left(\frac{\left(\frac{1}{1-\eta}\right)^{1-\eta}\left(\frac{1}{\eta}\right)^{\eta}}{\phi}\right)^{\phi}\left(\frac{1}{1-\phi}\right)^{1-\phi} w_o$. Taking natural logarithm of the gravity equation, we have:

$$\ln \pi_{do} = \ln T_o + \eta\theta \ln \delta_o - \frac{\theta}{\phi} \ln (w_o \cdot \tau_{do}) - \ln [\sum_s T_s \cdot \delta_s^{\eta\theta} \cdot (w_s \cdot \tau_{ds})^{-\frac{\theta}{\phi}}].$$

Because the comparison across exporters o is conditional on the same importer d for the same industry, the d-specific component $\ln [\sum_s T_s \cdot \delta_s^{\eta\theta} \cdot (w_s \cdot \tau_{ds})^{-\frac{\theta}{\phi}}]$ is "differenced out". Therefore, other things being equal,

$$\frac{\partial \ln \pi_{do}}{\partial \ln \delta_o} \mid_d = \eta\theta.$$

Let's further compare two industries that differ in η in the same export country o:

$$\frac{\partial^2 \ln \pi_{do}}{\partial \ln \delta_o \partial \eta} \mid_d = \theta. \tag{A.11}$$

Deriving the effect on import share is more involved. Other things being equal, the comparison across importers d conditional on the same exporter o for the same industry gives

$$\frac{\partial \ln \pi_{do}}{\partial \ln \delta_d} |_o = -\frac{\partial \ln \Phi_d}{\partial \ln \delta_d} = -\eta\theta \cdot \pi_{dd}.$$

Further compare two industries that differ in η in the same import country d:

$$\frac{\partial^2 \ln \pi_{do}}{\partial \ln \delta_d \partial \eta} |_o = -\theta \cdot \pi_{dd}(1 + \frac{\partial \ln \pi_{dd}}{\partial \ln \eta}). \tag{A.12}$$

So we need to inspect the value of $\frac{\partial \ln \pi_{dd}}{\partial \ln \eta}$. Other things being equal, we have the following expression for different industries that vary in η in the same importer country d:

$$\begin{aligned}\frac{\partial \ln \pi_{dd}}{\partial \ln \eta} = \eta \frac{\partial \ln \pi_{dd}}{\partial \eta} = \eta\theta(\ln \delta_d - \sum_s \pi_{ds} \cdot \ln \delta_s) &= \sum_s \pi_{ds} \cdot \ln\left[(\delta_d/\delta_s)^{\eta\theta}\right] \\ &= \sum_{s \neq d} \pi_{ds} \cdot \ln\left[(\delta_d/\delta_s)^{\eta\theta}\right].\end{aligned}$$

The last equality holds because $\ln\left[(\delta_d/\delta_d)^{\eta\theta}\right] = 0$. Note that wage w is the same for different industries in the same country. So comparing different industries within the same country differences out the effect of wage.

Restriction on Trade-share-weighted Log Difference in Judicial Quality

To complete the proof of Proposition 2, we impose the following restriction.

Assumption 1. *The trade-share-weighted log difference in judicial quality δ between a country d and all its trade partner s satisfies:*

$$\sum_{s \neq d} \pi_{ds} \cdot \ln\left[(\delta_d/\delta_s)^{\eta\theta}\right] > -1.$$

In a nutshell, R.1 implies that the trade-share-weighted log difference in judicial quality between a country d and all its trade partners can not be too negative such that $\sum_{s \neq d} \pi_{ds} \cdot \ln\left[(\delta_d/\delta_s)^{\eta\theta}\right] > -1$. Put it differently, we must make sure that a country's judicial quality cannot be *too worse* than its "average" trade partner. Note that such an "average" trade partner also includes country d, whose weight is the domestic trade share π_{dd}. Intuitively, if international trade costs are high so $1 - \pi_{dd}$ is low, R.1 is very likely to hold because $\pi_{dd} \cdot \ln\left[(\delta_d/\delta_d)^{\eta\theta}\right] = 0$.

In theory, nothing guarantees that $\sum_{s \neq d} \pi_{ds} \cdot \ln\left[(\delta_d/\delta_s)^{\eta\theta}\right] > -1$, so whether R.1 holds or not is ultimately an empirical question. Fortunately, we can compute $\sum_{s \neq d} \pi_{ds} \cdot \ln\left[(\delta_d/\delta_s)^{\eta\theta}\right]$ from the data for each importer-industry pairs to empirically validate R.1.[1] It turns out that $\sum_{s \neq d} \pi_{ds} \cdot \ln\left[(\delta_d/\delta_s)^{\eta\theta}\right] > -1$ holds for more than 99% of the importer-industry pairs in our data.[2] Therefore, R.1 is a reasonable restriction to impose.

To furthermore interpret why R.1 holds in the data, let's consider three groups of countries with different levels of judicial quality δ. First, for countries with relatively high levels of δ, $\sum_{s \neq d} \pi_{ds} \cdot \ln\left[(\delta_d/\delta_s)^{\eta\theta}\right]$ is likely to be positive because these countries are usually better than their "average" trade partners in judicial quality. Second, for countries whose δs are

[1]The constructions of industry-level trade share π_{ds} and contract intensity η follow Appendix B 2.1 and 2.2. Following Simonovska and Waugh (2014), we calibrate $\theta = 4$. δ_d and δ_s are calculated as one minus "the cost to enforce contracts as a percentage of the claim value" obtained from World Bank's "Doing Business Survey" in 2004 from World Bank (2021), the earliest year in which this cost share measure is available.

[2]More specifically, the 1%, 5%, 10%, and 25% percentiles of $\sum_{s \neq d} \pi_{ds} \cdot \ln\left[(\delta_d/\delta_s)^{\eta\theta}\right]$ are -0.889, -0.277, -0.125, and -0.019, respectively.

close to the average level, $\sum_{s\neq d}\pi_{ds}\cdot\ln\left[(\delta_d/\delta_s)^{\eta\theta}\right]$ is also close to 0. Third, for countries with low levels of δ, the value of $\ln\left[(\delta_d/\delta_s)^{\eta\theta}\right]$ could be quite negative. However, these countries also tend to be less open to trade, meaning that their trade intensity with foreign countries π_{ds} is also low. With these two forces, $\sum_{s\neq d}\pi_{ds}\cdot\ln\left[(\delta_d/\delta_s)^{\eta\theta}\right]$ for these countries turn out to be negative but still higher than -1.

Therefore, with R.1 being supported by our data, we have

$$\frac{\partial^2\ln\pi_{do}}{\partial\ln\delta_d\partial\eta}\,|_o = -\theta\cdot\pi_{dd}(1+\sum_{s\neq d}\pi_{ds}\cdot\ln\left[(\delta_d/\delta_s)^{\eta\theta}\right])<0. \tag{A.13}$$

1.5 Proof of Proposition 3

To prove Proposition 3, note that

$$p_{do}=\left(\tau_{do}\cdot\frac{w_o}{1-\phi}\right)^{\frac{1}{1-\chi}}\cdot\Phi_d^{\frac{\chi}{\theta(\alpha-\chi)}}\cdot\Gamma^p \tag{A.14}$$

and

$$z_{do}=\left(\tau_{do}\cdot\frac{w_o}{1-\phi}\right)^{\frac{1}{1-\chi}}\cdot\Phi_d^{\frac{1}{\theta(\alpha-\chi)}}\cdot\Gamma^z. \tag{A.15}$$

Taking natural logarithm, we have:

$$\begin{aligned}\ln p_{do}&=\frac{1}{1-\chi}\ln\tau_{do}+\frac{1}{1-\chi}\ln\frac{w_o}{1-\phi}+\frac{\chi}{\theta(\alpha-\chi)}\ln\Phi_d+\ln\Gamma^p,\\ \ln z_{do}&=\frac{1}{1-\chi}\ln\tau_{do}+\frac{1}{1-\chi}\ln\frac{w_o}{1-\phi}+\frac{1}{\theta(\alpha-\chi)}\ln\Phi_d+\ln\Gamma^z.\end{aligned}$$

Γ^p and Γ^z are both constant terms. We compare different exporters o given the same importer d for the same industry. Other things being equal,

$$\frac{\partial \ln p_{do}}{\partial \ln \delta_o} |_d = 0; \quad \frac{\partial \ln z_{do}}{\partial \ln \delta_o} |_d = 0.$$

Let's further compare two industries that differ in η in the same export country o:

$$\frac{\partial^2 \ln p_{do}}{\partial \ln \delta_o \partial \eta} |_d = 0; \quad \frac{\partial^2 \ln z_{do}}{\partial \ln \delta_o \partial \eta} |_d = 0.$$

For derive the effects on import price and quality, we compare different importers d conditional on the same exporter o for the same industry:

$$\frac{\partial \ln p_{do}}{\partial \ln \delta_d} |_o = \frac{\chi}{\theta(\alpha - \chi)} \frac{\partial \ln \Phi_d}{\partial \ln \delta_d} = \frac{\eta \chi}{\alpha - \chi} \cdot \pi_{dd},$$
$$\frac{\partial \ln z_{do}}{\partial \ln \delta_d} |_o = \frac{1}{\theta(\alpha - \chi)} \frac{\partial \ln \Phi_d}{\partial \ln \delta_d} = \frac{\eta}{\alpha - \chi} \cdot \pi_{dd}.$$

Further compare two industries that differ in η in the same importer country d:

$$\frac{\partial^2 \ln p_{do}}{\partial \ln \delta_d \partial \eta} |_o = \frac{\chi}{\alpha - \chi} \pi_{dd} (1 + \frac{\partial \ln \pi_{dd}}{\partial \ln \eta}); \quad \frac{\partial^2 \ln z_{do}}{\partial \ln \delta_d \partial \eta} |_o = \frac{1}{\alpha - \chi} \pi_{dd} (1 + \frac{\partial \ln \pi_{dd}}{\partial \ln \eta}). \qquad \text{(A.16)}$$

By further imposing R.1 as in Appendix A 1.4, we have $\frac{\partial^2 \ln p_{do}}{\partial \ln \delta_d \partial \eta} |_o > 0$ and $\frac{\partial^2 \ln z_{do}}{\partial \ln \delta_d \partial \eta} |_o > 0$.

1.6 The Impact of Quality on Demand & Profit Maximisation

In this section, we show that a producer's profit maximisation problem recognises the impact of quality on demand, and is equivalent to a cost minimisation problem of choosing output quality z to minimise cost *per quality unit*. We obtain the same solution to output quality z as in the main paper by solving the profit maximisation problem.

We use the following CES (constant elasticity of substitution) utility function for the representative consumer in country d:

$$U_d = \left\{ \int_0^1 [q_d(\omega) \cdot z_d(\omega)]^{\frac{\sigma-1}{\sigma}} d\omega \right\}^{\frac{\sigma}{\sigma-1}}, \quad \sigma > 1,$$

where $q_d(\omega)$ is the quantity of variety ω consumed in country d, while $z_d(\omega)$ is the quality of that variety. Therefore, quality of a variety ω increases the per-unit satisfaction of consuming ω. Such a formulation (or similar formulation) of how quality enters the utility function is common in the literature of international trade (e.g., Hummels and Klenow, 2005; Hallak, 2006; Mandel, 2010; Hallak and Schott, 2011; Kugler and Verhoogen, 2012; Johnson, 2012; Crozet *et al.*, 2012; Khandelwal *et al.*, 2013; Feenstra and Romalis, 2014a; Fan *et al.*, 2015; Fan *et al.*, 2020).

The total expenditure spent on the continuum of variety $\omega \in [0, 1]$ is X_d in country d. The budget constraint is thus $X_d \geq \int_0^1 p_d(\omega) \cdot q_d(\omega) d\omega$. Utility maximisation subject to the budget constraint yields the following demand function as in equation (1) in the main paper:

$$q_d(\omega) = p_d(\omega)^{-\sigma} \cdot \Psi_d^{\sigma-1} \cdot X_d \cdot z_d(\omega)^{\sigma-1}, \tag{1}$$

where $\Psi_d = \{\int_0^1 [p_d(\omega)/z_d(\omega)]^{1-\sigma} d\omega\}^{\frac{1}{1-\sigma}}$ is the exact price index in country d, taking into account the effects of price and quality of each variety consumed. Equation (1) explicitly recognises the impact of quality on demand: Conditional on price of variety ω and other aggregate variables, an increase in quality of ω raises the quantity consumption of ω. Intuitively, consumers prefer variety with lower price and higher quality.

Notice that in such a formulation, the amount of effective consumption $Q_d(\omega) = q_d(\omega) \times z_d(\omega)$ determines the utility of consuming variety ω. The demand for effective consumption is therefore:

$$Q_d(\omega) = P_d(\omega)^{-\sigma} \cdot \Psi_d^{\sigma-1} \cdot X_d,$$

where $P_d(\omega) = p_d(\omega)/z_d(\omega)$ is the price per quality unit or quality-adjusted price of variety ω. So given the aggregate variables Ψ_d and X_d, the price per quality unit of ω, $P_d(\omega)$, determines the demand for effective consumption of variety, $Q_d(\omega)$. When deciding how many units of effective consumption to purchase, consumers only evaluate different varieties by their quality-adjusted prices. Price $p_d(\omega)$ and quality $z_d(\omega)$ affect demand by changing the quality-adjusted price $P_d(\omega)$: An increase in price raises quality-adjusted price and depresses demand, while an increase in quality lowers quality-adjusted price and boosts demand.

Given the demand function $q_d(\omega)$ and $Q_d(\omega)$, we next show that a producer's profit maximisation problem that recognises the impact of quality on demand is equivalent to the cost minimisation in Subsection 2.1 in the main paper.

A producer's profit of selling variety ω in country d (if it sells in d at all) is:

$$\pi_d(\omega) = [p_d(\omega) - \tau_d \cdot c_d(\omega)]q_d(\omega)$$

$$= [p_d(\omega) - \tau_d \cdot c_d(\omega)]p_d(\omega)^{-\sigma} \cdot \Psi_d^{\sigma-1} \cdot X_d \cdot z_d(\omega)^{\sigma-1},$$

where $c_d(\omega) = b \cdot \frac{z_d(\omega)^\alpha}{\varphi(\omega)} \cdot \delta^{-\eta} + t \cdot z_d(\omega)^\chi$ collects the input cost and service cost per quantity unit. τ_d is the *ad valorem* trade cost. Given price $p_d(\omega)$, higher quality induces not only higher cost $c_d(\omega)$ but also higher demand by consumers as in (1). Since consumers make decisions based on quality-adjusted prices, we transform the profit function to reflect the role of quality-adjusted price:

$$\pi_d(\omega) = [P_d(\omega) - \tau_d \cdot \frac{c_d(\omega)}{z_d(\omega)}]P_d(\omega)^{-\sigma} \cdot \Psi_d^{\sigma-1} \cdot X_d, \tag{A.17}$$

where $P_d(\omega) = p_d(\omega)/z_d(\omega)$ is the quality-adjusted price of ω. Because the final goods market for ω is perfectly competitive and consumers decide their effective consumption by assessing quality-adjusted prices, the producer of variety ω maximises profit $\pi_d(\omega)$ by taking $P_d(\omega)$, Ψ_d and X_d as given. So the profit maximisation problem is

$$\max_{z_d(\omega)} [P_d(\omega) - \tau_d \cdot \frac{c_d(\omega)}{z_d(\omega)}]P_d(\omega)^{-\sigma} \cdot \Psi_d^{\sigma-1} \cdot X_d \Rightarrow \min_{z_d(\omega)} \frac{c_d(\omega)}{z_d(\omega)}. \tag{A.18}$$

(A.18) indicates that a producer's profit maximisation problem is equivalent to choosing an output quality $z_d(\omega)$ that minimises cost per quality unit. The intuition is that a producer can only maximise its profit by minimizing its cost in a perfectly competitive market.[3] On one hand, since $c_d(\omega) = b \cdot \frac{z_d(\omega)^\alpha}{\varphi(\omega)} \cdot \delta^{-\eta} + t \cdot z_d(\omega)^\chi$, an increase in $z_d(\omega)$ raises the numerator of $\frac{c_d(\omega)}{z_d(\omega)}$, the cost of making goods per quantity unit $c_d(\omega)$. On the other hand, an increase in $z_d(\omega)$ in the denominator of $\frac{c_d(\omega)}{z_d(\omega)}$ deflates the effective cost per quality unit by increasing consumer's valuation for each quantity unit of goods, so they are more willing to bear the

[3]In fact, even when the market structure is monopolistic competition, because $P_d(\omega) = \frac{\sigma}{\sigma-1}\frac{c_d(\omega)}{z_d(\omega)}$ due to the constant markup, the profit maximisation problem is again equivalent to the cost minimisation by choosing output quality z.

higher cost per quantity unit. Such a trade-off gives rise to the same optimal quality choice as indicated in equation (6) in the main paper:

$$z_d(\omega) = \Big(\frac{1-\chi}{\alpha-1} \cdot \frac{t \cdot \varphi(\omega)}{b} \cdot \delta^{\eta}\Big)^{1/(\alpha-\chi)}. \tag{6}$$

So our model directly incorporates the impact of quality on demand both in consumer's preference and in producer's optimization problems. Price and quality affect consumer's demand for effective consumption by changing quality-adjusted price. A producer's profit maximisation problem is equivalent to its cost minimisation problem in choosing output quality, yielding the same solution to output quality as equation (6) in the main paper.

1.7 Discussion: Alternative Model Assumptions

Our framework offers several sharp predictions regarding how judicial quality shapes trade margins. These predictions are robust to alternative model assumptions.

First, while we adopt a Ricardian model following Eaton and Kortum (2002), our results are unchanged when we instead assume monopolistic competition with heterogeneous firms. When final goods producers are heterogeneous firms à la Melitz (2003) and productivity distribution is Pareto as in Chaney (2008), we obtain the same results as in Propositions 2 and 3, with θ being the dispersion parameter of Pareto distribution.[4]

Second, while we only consider domestic input sourcing, our results should be robust to international sourcing. On the one hand, international sourcing incurs huge fixed costs (Antràs and Helpman, 2004; Antras *et al.*, 2017), so most producers source most of their

[4]Feenstra and Romalis (2014a) also adopt this setup. Under this setup, allowing for free entry basically introduces agglomeration in T_o in our framework and does not substantially change the results.

inputs from domestic suppliers (Amiti *et al.*, 2014; Kee and Tang, 2016). The contractual frictions of the domestic transactions hinge on the domestic contracting environment. On the other hand, if international sourcing undermines any linkage between a country's input cost and its contracting environment, it tends to work against our predictions. Hence, we would underestimate the actual effects of our proposed mechanisms.

Third, as another mechanism, variable markup cannot generate our predictions about import price. Tougher domestic competition due to better judicial quality should lower markups of imported varieties and depress import price, so variable markup predicts a negative $\frac{d^2 \ln p_{do}}{d \ln \delta_d d\eta} |_o$. We show in Subsection 5.2 in the main paper that the estimates of $\frac{d^2 \ln p_{do}}{d \ln \delta_d d\eta} |_o$ are actually all positive.

1.8 Extension: CES Production Function of Quantity

We relax the assumption of Leontief production function for q in (4) in the main paper:

$$q = \min \{q^c, q^s\} \tag{4}$$

and use a more general CES form:

$$q = \left[(q^c)^{\frac{\rho-1}{\rho}} + (q^s)^{\frac{\rho-1}{\rho}} \right]^{\frac{\rho}{\rho-1}}. \tag{A.19}$$

$\rho < 1$ indicates that q^c and q^s are complements and $\rho > 1$ indicates that they are substitutes. $\rho = 0$ corresponds to the Leontief production function we use in the main paper. $\rho = 1$ indicates a Cobb-Douglas production function. Using a CES form does not affect our theoretical results.

A final goods producer now minimises the total input cost, subject to the constraints of quality and quantity production technologies:

$$\min_{\lambda^c,\lambda^s,q^c,q^s} [\frac{w \cdot \lambda^c \cdot q^c}{\delta} + w \cdot \lambda^s \cdot q^s]$$
$$\text{s.t.} \quad z = [\varphi \cdot (\lambda^c)^{\eta} \cdot (\lambda^s)^{1-\eta}]^{\frac{1}{\alpha}} \ \text{ and } \ q = \left[(q^c)^{\frac{\rho-1}{\rho}} + (q^s)^{\frac{\rho-1}{\rho}}\right]^{\frac{\rho}{\rho-1}}.$$

Combining the first-order conditions with respect to λ^c and λ^s, we have

$$\frac{\lambda^c \cdot q^c}{\lambda^s \cdot q^s} = \frac{\eta}{1-\eta} \cdot \delta.$$

Combining the first-order conditions with respect to q^c and q^s, we have

$$\frac{\lambda^c}{\lambda^s} = \left(\frac{q^c}{q^s}\right)^{-\frac{1}{\rho}} \delta.$$

Combining the two conditions above, we obtain

$$\frac{\lambda^c}{\lambda^s} = \left(\frac{\eta}{1-\eta}\right)^{\frac{1}{1-\rho}} \delta, \quad \frac{q^c}{q^s} = \left(\frac{\eta}{1-\eta}\right)^{\frac{\rho}{\rho-1}}. \tag{A.20}$$

Better judicial quality encourages the final goods producer to choose relatively higher customised input quality. When q^c and q^s are complements ($\rho < 1$), the relative quality of customised input also increases with contract intensity η.

With these two optimal ratios $\frac{\lambda^c}{\lambda^s}$ and $\frac{q^c}{q^s}$, we can solve the *per-unit* input cost, given output quality z and quantity q:

$$\left[\frac{w \cdot \lambda^c \cdot q^c}{\delta} + w \cdot \lambda^s \cdot q^s\right] q^{-1} = \overline{b} \cdot \frac{z^{\alpha}}{\varphi} \cdot \delta^{-\eta}, \tag{A.21}$$

where $\overline{b} = \left[\left(\frac{1}{1-\eta}\right)^{1-\eta}\left(\frac{1}{\eta}\right)^{\eta}\right]^{\frac{1}{1-\rho}} w$. (A.21) is almost identical to the *per-unit* input cost in equation (5) in the main paper:

$$b \cdot \frac{z^{\alpha}}{\varphi} \cdot \delta^{-\eta}, \tag{5}$$

in which only $b = \left(\frac{1}{1-\eta}\right)^{1-\eta}\left(\frac{1}{\eta}\right)^{\eta} w$ slightly differs from $\overline{b}$ in the constant term. In fact, if we assume $\rho = 0$ (Leontief), (A.21) collapses to (5). So the CES form nests the Leontief form we use in the main paper.

Therefore, if we use a CES form for q as (A.19), all the theoretical results starting from (5) in our paper will remain the same, except that one needs to replace b with $\overline{b}$ to reflect the difference in the constant term. As long as producing q requires q^c and q^s, (A.21) holds for all plausible values of ρ. However, only when q^c and q^s are complements ($\rho < 1$), the relative quality of customised input is increasing in contract intensity η.

1.9 Equilibrium

We introduce the following additional assumptions about goods market and labour market to help defining the general equilibrium.

1. **Multiple industry**: Since there are multiple industries in the economy, we explicitly index them using superscript g. So π^g_{do} reflects the share of country d's expenditure on industry g spent on goods produced by country o.

2. **Preference**: The utility function for varieties in industry g, $\omega^g \in [0, 1]$, takes the CES form:

$$U^g_d = \left\{\int_0^1 Q^g_d(\omega^g)^{\frac{\sigma^g-1}{\sigma^g}} d\omega^g\right\}^{\frac{\sigma^g}{\sigma^g-1}};\ \sigma^g > 1.$$

On the top of that, a Cobb-Douglas preference aggregates U_d^g across industries to determine the representative consumer's overall utility:

$$U_d = \Pi_g (U_d^g)^{\alpha_d^g}, \ \sum_g \alpha_d^g = 1.$$

α_d^g is the share of expenditure spent on industry g for the representative consumer in country d.

3. **Factor input**: The production of customised input and standardised input requires labour as the only input. Service cost is also paid by labour. Workers are mobile across different industries within a country but immobile across different countries.

4. **Balanced trade**: Trade is balanced. So a country's total spending must equal to its total income.

The trade share for a particular industry g now becomes

$$\pi_{do}^g = \frac{T_o^g (\delta_o)^{\eta^g \theta^g} (w_o \cdot \tau_{do}^g)^{-\frac{\theta^g}{\phi^g}}}{\sum_s T_s^g (\delta_s)^{\eta^g \theta^g} (w_s \cdot \tau_{ds}^g)^{-\frac{\theta^g}{\phi^g}}}. \tag{A.22}$$

Note that parameters η, ϕ and θ are allowed to vary across g. Exogenous productivity T_o^g and bilateral trade cost τ_{do}^g can differ across g as well. Wage rate w_o appears in the equation because we assume that labour is the only factor input.

Since the final goods market is perfectly competitive, labour market clearing indicates that a country o's total labour income must equal to the sum of its sales across all countries (including o itself) and industries:

$$w_o \cdot L_o = \sum_g \sum_d \pi_{do}^g \cdot X_d^g. \tag{A.23}$$

Balanced trade suggests that a country d's spending on a particular industry is the share of its labour income spent on that industry:

$$X_d^g = \alpha_d^g \cdot w_d \cdot L_d. \tag{A.24}$$

Combining conditions (A.22), (A.23) and (A.24), we can formally define a general equilibrium as follows.

DEFINITION 1. *Given parameters* α_d^g, θ^g, ϕ^g, η^g *and exogenous variables* $\{T_o^g\}$, $\{L_o\}$, $\{\delta_o\}$, $\{\tau_{do}^g\}$ *for all industries* g *and all countries* d *and* o, *a general equilibrium is a wage vector* $\{w_o\}$ *satisfying conditions (A.22), (A.23) and (A.24) for all* g, d, *and* o.

2 Appendix B: Data and Variables

We describe the details about data and variable constructions in this section. Subsections B 2.1 to 2.3 describe the cross-sectional data in 1997 that are used in the main analysis (Subsections 5.1 to 5.3 in the main paper). Subsection B 2.4 describes the empirical strategy and the panel data used in Subsection 5.4 in the main paper.

2.1 Bilateral Trade Pattern, Price, and Quality

Bilateral trade data for each 4-digit code of the Standard International Trade Classification (SITC henceforth) Revision 2 are drawn from the United Nations Comtrade (UN Comtrade henceforth) data provided by United Nations Statistics Division (2021). Our sample contains 198 countries and $1,167$ unique combinations of the SITC 4-digit code and the unit of measurement. The trade data are also mapped to the U.S. Bureau of Economic Analysis (BEA henceforth) 1997 I-O industry classification of 225 I-O industries. All trade data are in the year of 1997.

We use the BEA I-O industry classification to define different industries. To measure bilateral trade share π_{do}^{g} at the industry level, we first calculate the share of country d's import value from country o in country d's total import value for an industry g, Imp_{do}^{g}. We then use the World Input-Output Database (WIOD henceforth) illustrated in Timmer *et al.* (2015a) and provided in Timmer *et al.* (2015b) to calculate the share of total imports from all other countries over total domestic absorption in each WIOD sector for each country in 1997. These total import shares are then mapped to the SITC 4-digit level and then to the BEA I-O industry level.[5] Multiplying Imp_{do}^{g} by the total import share of country d in

[5]Hence, the country-industry-level total import share only varies at the WIOD sector level, which is usually more aggregate than the BEA I-O industry level. The choice of the WIOD-level total import share is due

that BEA I-O industry gives π^g_{do}. For robustness, we use free-on-board (FOB henceforth) value and trade value including cost, insurance, and freight (CIF henceforth) to construct two measures of π^g_{do}.

We also construct another measure of bilateral trade share based on the number of traded varieties (measured by the unique combinations of SITC 4-digit-unit and exporter). First, we calculate the share of country d's number of imported varieties from o in country d's total number of imported varieties for a BEA I-O industry. We then multiply this variety share by the total import share of country d in that BEA I-O industry to obtain the variety-based bilateral trade share.[6]

The price or unit value of bilateral trade is computed at the exporter-importer-product level. We define a product as a unique combination of SITC 4-digit code and unit of measurement. Bilateral trade price is computed as bilateral trade value divided by bilateral traded quantity. For robustness, we construct both FOB price and CIF price. The construction of bilateral trade quality index in each SITC 4-digit-unit cell follows Feenstra and Romalis (2014a). Specifically, Feenstra and Romalis (2014a) estimate trade quality in a model of quality choice that shares a lot of key features with our theoretical model.[7] Because Feenstra and Romalis (2014a) endogenises quality choice, their estimated quality indexes are more robust to the assumptions about the extensive margin and number of varieties than

to the data limitation in computing domestic absorption at a more disaggregate industry level for different countries.

[6]The share of d's total number of imported varieties in d's total number of absorbed varieties is not available, so we use the value-based import share as a proxy.

[7]Although Feenstra and Romalis (2014a) is based on a firm heterogeneity model, under their assumption of Pareto productivity distribution, most of their implications are highly similar to ours. We refer our readers to the original paper of Feenstra and Romalis (2014a) for the details of their model and estimation. Feenstra and Romalis (2014a) also consider differences in preference for quality due to differences in cross-country per capita income. Our empirical results are robust to this adjustment.

those obtained by the demand-side approach.[8] The programs to construct these estimates of quality are from Feenstra and Romalis (2014b).

Importantly, their bilateral export quality index is only comparable across exporters conditional on an importer d for a product, and their bilateral import quality index is only comparable across importers conditional on an exporter o for a product. Thus, the inclusions of importer-product fixed effects ζ_d^g in (19) and exporter-product fixed effect ζ_o^g in (20) in the main paper are essential when estimating the effects on quality.

2.2 Judicial Quality and Contract Intensity

Our preferred measure of country-level judicial quality JQ is the "rule of law" indicator from Kauffmann *et al.* (2004), which measures a country's efficiency and consistency in judicial procedures and practice, as well as its situation of contract enforcement, during 1997-98. Moreover, Gwartney and Lawson (2003) and the World Bank's "Doing Business Survey" also provide measures on judicial quality and contract enforcement for each country. We use these two alternative measures in our robustness analysis.[9]

Our measure of contract intensity η^g comes from Nunn (2007b). Using a classification of customised products at the SITC 4-digit level from Rauch (1999a), a concordance table between the SITC 4-digit product and the BEA I-O industry, and the U.S. I-O table, Nunn (2007a) constructs contract intensity as the cost share of customised input in total input for

[8] The demand-side approach estimates quality as a "product appeal" after eliminating the effect of price (e.g., Khandelwal, 2010; Hallak and Schott, 2011; Khandelwal *et al.*, 2013).

[9] Most of the variation in country-level judicial quality comes from the country-specific component that does not vary over time. For example, country fixed effects account for 95.3% of the total variation in Kauffmann *et al.* (2004)'s JQ measure (1996–2018).

each BEA I-O industry.[10] This measure is consistent with our interpretation of η^g.[11] For the analysis of price and quality of trade, we map η^gs to the SITC 4-digit level.

2.3 Control Variables

Measures of skill intensity and capital intensity are drawn from Nunn (2007b). The construction of the external finance dependence measure follows Rajan and Zingales (1998) by using a sample of U.S. listed companies from the Compustat Capital IQ North America Database provided by Standard and Poor's (2021). Other industry characteristics, including value-added share, intra-industry trade share, productivity growth, and Herfindahl index of input concentration, are all from Nunn (2007b). The above measures are all at the BEA I-O industry level, so we map them to the SITC 4-digit level when the outcome variables are price and quality of trade. Country-level skill endowment, capital endowment, financial development, and per capita income are also from Nunn (2007b). Bilateral tariff data at the SITC 4-digit level are from Feenstra and Romalis (2014b). Information about bilateral distance, shared border, common official language, colonial tie, common currency union, and common FTA is from the Gravity database in Conte *et al.* (2021).

2.4 Panel Data: Empirical Strategy and Data Construction

Empirical Strategy

To test whether the patterns we found in 1997 also hold in more recent years, we apply the following specifications to a panel data sample at the yearly frequency to detect the effects

[10] Rauch (1999b) classifies all the SITC 4-digit products into three categories: "sold on an organised exchange", "reference priced", and "neither". Customised products are those classified as "neither".

[11] Rauch (1999b) provides a "conservative" standard and a "liberal" standard of classifications. We use η^g following the "conservative" standard in the main analysis. Our results are robust to the "liberal" standard.

of judicial quality on export margins (subscript t denotes year):

$$y^g_{do,t} = \beta_{E1} \cdot JQ_{o,t} \times \eta^g + \beta_{E2} \cdot H_{o,t} \times h^g_t + \beta_{E3} \cdot K_{o,t} \times k^g_t$$
$$+\zeta^g_{d,t} + \zeta_{o,t} + \mathbf{X}^g_{o,t} + \mathbf{B}^g_{do,t} + \varepsilon^g_{Edo,t}. \qquad \text{(B.1)}$$

In equation (B.1), we fix η^g to its value in 1997 and interact it with $JQ_{o,t}$, because the measure of η^g is not available in more recent years.[12] We also include importer-industry(product)-year fixed effects and exporter-year fixed effects to control for the effects of any industry-year- or product-year-specific demand-side factors and the effects of any time-varying exporter characteristics. Similar to our baseline specifications, β_{E1}, β_{E2}, and β_{E3} are identified using the variations across exporters within an importer-industry-year or importer-product-year cell. Another reason for using cross-sectional variations across countries for identification is that the variation of judicial quality across years for a given country is very limited. The symmetric equations and controls apply to the importer regression specification:

$$y^g_{do,t} = \beta_{I1} \cdot JQ_{d,t} \times \eta^g + \beta_{I2} \cdot H_{d,t} \times h^g_t + \beta_{I3} \cdot K_{d,t} \times k^g_t$$
$$\zeta^g_{o,t} + \zeta_{d,t} + \mathbf{X}^g_{d,t} + \mathbf{B}^g_{do,t} + \varepsilon^g_{Ido,t}. \qquad \text{(B.2)}$$

[12]In principle, contract intensity can vary over time. However, due to data limitation, this measure is unavailable in other years besides 1997. Since industry-specific production technology is expected to be relatively stable over 15 years (1997-2011), we argue that the usage of a time-variant measure, if available, would not significantly change our results. Moreover, using such a time-invariant measure of η^g might also benefit our estimation by avoiding potential endogenous responses of contract intensity to changes in JQ across years.

We instrument for a country's judicial quality interaction using the interactions of its legal origin dummies with contract intensity. Note that a country's legal origin is typically determined centuries ago and is therefore time-invariant. We standardise all explanatory variables to directly compare their relative importance.

Panel Data Construction

We describe how to construct a panel data from 1997 to 2011.[13] The data sources and construction methods of all variables are in line with our baseline cross-sectional sample of 1997, unless stated otherwise.

Bilateral trade pattern, price and quality. The bilateral trade data for each 4-digit code of the SITC Revision 2 during 1978–2018 are drawn from the United Nations Comtrade Database (UN Comtrade) provided by United Nations Statistics Division (2021). Our final panel data sample from 1997 to 2011 contains 201 economies and $1,222$ unique combinations of the SITC 4-digit code and the unit of measurement. The trade data in each year are mapped to the U.S. BEA 1997 I-O industry classification. When calculating bilateral trade shares, we use the WIOD data provided by Timmer *et al.* (2015b) to construct the share of total imports in total absorption for each WIOD sector-country in each year. With these data in hand, we further construct the unit values of bilateral trade, bilateral trade shares based on the number of traded varieties, and quality indexes inferred using the demand-side approach with different estimates of elasticity of substitution σ.[14]

[13] 2011 is the most recent year in which all major variables are available.

[14] The different estimates of σ we use include a common $\sigma = 5$ for all products (Anderson and Van Wincoop, 2004), Feenstra and Romalis (2014a)'s estimates at the SITC 4-digit-unit level, σ^{FR}, and Broda and Weinstein (2006a)'s estimates at the SITC 4-digit level, σ^{BW}.

Correct for measurement error in trade data. Feenstra and Romalis (2014a) note that "*there is a large amount of measurement error in the unit values from the UN Comtrade database*". They follow several steps to correct for the measurement error. First, they omit the observations where countries are excluded from the Penn World Table data, or importers are the same as their exporters. Second, they omit observations where the ratio of the c.i.f. unit value reported by the importer and the f.o.b. unit value reported by the exporter, for a given 4-digit SITC product and year, was less than 0.1 or exceeded 10. Third, they omit bilateral observations where the c.i.f. value of trade was less than $50,000$ in constant 2005 dollars, or the unit of measurement is absent. Fourth, only observations with both the c.i.f. and f.o.b. values are used to construct the regression sample. Following Feenstra and Romalis (2014a), we supplement observations where either the c.i.f. value or the f.o.b. value is missing with estimated values based on *ad valorem* trade costs.

Judicial quality and contract intensity. The country-level "rule of law" indicator for each year is from the Worldwide Governance Indicators (WGI henceforth) provided by Kaufmann and Kraay (2021) and is produced by Daniel Kaufmann and Aart Kraay, who also developed the judicial quality measure in our baseline analysis. The WGI data report aggregate and individual governance indicators for 214 economies over the period 1996-2018. The data are missing for $t = 1997$, 1999 and 2001, so we take the averages of the $t - 1$ and $t + 1$ values to fill in those missing values. The contract intensity measure η^g is from Nunn (2007b). It is difficult to extend this measure to more recent years, because Rauch (1999b)'s classification of customised products may not apply to later periods.

Skill and capital endowments. We use the human capital index in Penn World Table (PWT henceforth) version 10.0 provided by Feenstra *et al.* (2015) to measure a country's skill endowment. This human capital index slightly differs from the skill endowment measure in Nunn (2007a). The human capital index in the PWT data is based on information of average years of schooling from Barro and Lee (2013), Cohen and Soto (2007) and Cohen and Leker (2014), and an assumed rate of education return based on Mincer equation estimates (Psacharopoulos, 1994). Nunn (2007a), on the other hand, uses data of human capital endowments from Antweiler and Trefler (2002), which are only based on information of educational attainment from Barro and Lee (1993). PWT also provides country-level capital endowment in each year, which is the primary data source for country-level physical capital stock used in Summers and Heston (1991), Antweiler and Trefler (2002), and Nunn (2007a).

Skill and capital intensities. Following Nunn (2007a), skill intensity and capital intensity during 1997-2011 are constructed using the NBER-CES Manufacturing Industry Database provided by Bureau of Economic Analysis (2021b). Skill intensity h_t^g is equal to 1 minus the ratio of production worker wages to total payroll in industry g in the United States in each year. Capital intensity k_t^g is equal to the ratio of total real capital stock to total value added in industry g in the United States in each year. These indicators in the NBER-CES Database follow the 1997 NAICS industry classification. We map them to the U.S. BEA 1997 I-O industry classification using the concordance provided by Lawson *et al.* (2002).

Other country-level and industry-level characteristics. A country's financial development indicator for each year is measured by the natural logarithm of credit by banks and other financial institutions to the private sector as a share of GDP, obtained from the Financial Development and Structure Dataset provided by Beck *et al.* (2019). We use the natural logarithm of real GDP at constant 2017 national prices divided by total population from the PWT to calculate log per capita income. Due to data limitation, the measure of external finance dependence is only available for 1997, so we use the 1997 measure for other years as well. Industry-level value added share in each year is measured by the ratio of total value added to total value of shipments in industry g in the United States. Industry-level productivity growth is measured by the average growth rate in TFP of industry g in the United States in the past 21 years (during $t-1$ to $t-21$). These two measures are constructed using the NBER-CES Manufacturing Industry Database. Industry-level (I-O industry classifications) and product-level (SITC 4-digit-unit level) intra-industry trade share (the Grubel-Lloyd index) for U.S. in each year is calculated using the bilateral trade data from the UN Comtrade database. Industry-level Herfindahl index of input concentration is constructed using the United States Input-Output Use Table (71 industries, 1997-2019) from Bureau of Economic Analysis (2021a). We also construct concordance tables to harmonise the BEA I-O industry classifications across years.

Bilateral control variables. Bilateral tariff data at the SITC 4-digit level from 1997 to 2011 are from Feenstra and Romalis (2014a). Information about bilateral distance, shared border, common official language, colonial tie, common currency union, and common FTA in each year is from the Gravity database in Conte *et al.* (2021).

3 Appendix C: Additional Empirical Results

To ensure the robustness of our findings, we consider alternative measures of judicial quality, contract intensity, and price and quality of trade, and report results using alternative specifications at the country-industry level. We also estimate our main specifications separately for customised industries/products and standardised industries/products. Finally, we report regression results that provide suggestive evidence of quasi-Rybczynski effect due to improvement in judicial quality over time.

3.1 Robustness: Alternative Measures of Judicial Quality and Contract Intensity

In the main analysis, our measure of judicial quality JQ is the "rule of law" indicator from Kauffmann *et al.* (2004). We also use two alternative measures of JQ. The first alternative is the "legal quality" indicator from Gwartney and Lawson (2003). The second alternative is a measure of the judicial system's efficiency from the World Bank's "Doing Business Survey". For contract intensity η, our preferred measure is constructed using customised inputs defined by the "conservative" standard of Rauch (1999b). We also use his "liberal" standard to define customised inputs and construct alternative contract intensity.

We re-estimate the specifications in Table 2 of the main paper using alternative measures of JQ and η and report the results in Table D.6. The top panel reports the effect of judicial quality on the export pattern, and the bottom panel reports the effect on the import pattern. In each row, we use a different measure of JQ. We use the "conservative"-based contract intensity in columns (1) to (3), and the "liberal"-based contract intensity in columns (4) to

(6). Each cell in the table reports the estimated coefficient and standard error for the judicial quality interaction, using legal origin to instrument for judicial quality. K-P F statistics and p-values of Hansen J statistics are also reported. Our results about the effects of judicial quality on trade patterns are robust. Regardless of the measures of JQ and η, the estimated coefficients of exporter's judicial quality interaction are significantly positive, while those of importer's judicial quality interaction are significantly negative.

[Table D.6 here]

We also re-estimate the specifications in Table 4 of the main paper using the same alternative measures of JQ and η and report the results in Table D.7 in a similar way. The estimated coefficients of exporter's judicial quality interaction are not different from 0 at any conventional levels of statistical significance, while 16 out of the 18 estimated coefficients of importer's judicial quality interaction are significantly positive at least at the 10% level.[15] Overall, our findings are robust to different measures of JQ and η.

[Table D.7 here]

3.2 Robustness: Alternative Price Measure at the HS 6-digit Level

One may worry that trade price at the SITC 4-digit level is not disaggregate enough to reflect the actual price variation, leading to potential measurement bias. To alleviate this concern, we use bilateral trade data at the HS 6-digit classification in 1997 from the UN Comtrade

[15]The t-statistics of the two insignificant estimates are 1.59 and 1.46, very close to the critical value of the 10% significance level.

database to construct trade price as our outcome variable (Manova and Zhang, 2012; Fan *et al.*, 2015).

In general, we obtain qualitatively similar results. Our OLS and IV estimates indicate that the estimated coefficients of importer's judicial quality interaction on the price of trade are positive and statistically significant at the 1% level. In contrast, the estimated coefficients of exporter's judicial quality interaction are all statistically not different from 0. Therefore, our results about trade prices do not seem to be driven by any measurement bias at the SITC 4-digit level.

[Table D.8 here]

3.3 Robustness: Alternative Specifications at Country-Industry Level

So far, we have been using the empirical strategy guided by our theoretical framework, which takes advantage of the bilateral feature of trade data. An alternative empirical strategy is to aggregate all variables to the country-industry level:

$$y_c^g = \beta_1 \cdot JQ_c \times \eta^g + \beta_2 \cdot H_c \times h^g + \beta_3 \cdot K_c \times k^g + \zeta_c + \zeta^g + \mathbf{X}_c^g + \varepsilon_c^g, \tag{C.1}$$

where subscript c denotes a country and superscript g denotes an industry or product. The outcome variable y_c^g is any trade-related variable varying at the country-industry level. JQ_c, H_c, and K_c are judicial quality, skill, and capital endowments of country c. $\mathbf{X}_c^g$ are control variables.[16] ζ_c and ζ^g are country fixed effects and industry (or product) fixed effects.

[16]Control variables include financial interaction, the interactions of log per capita income with value-added share, intra-industry trade share, production complexity, and TFP growth.

Previous studies use a similar strategy to detect if a particular country-level feature constitutes a comparative advantage for certain industries.[17] For example, Nunn (2007a) shows that a good contracting environment facilitates the exports of contract-intensive industries relatively more.

To measure the country-industry-level trade pattern, we calculate a country's total export value and total import share at the BEA I-O industry level. We also calculate a country's numbers of export destinations and import origins in each BEA I-O industry. The number of import origins is normalised by the domestic absorption at the country-industry level.[18] To measure country-product-level trade price and quality, we use a country's export price, import price, export quality index, and import quality index at the SITC 4-digit-unit level from Feenstra and Romalis (2014a).

Table D.9 reports the estimation results of (C.1) for different trade-related outcome variables, using legal origin to instrument for judicial quality. The top panel reports the results concerning different margins of exports. Our estimates in column (1) are very close to those obtained by Nunn (2007a).[19] Column (2) shows that the judicial quality interaction significantly increases the number of export destinations, so part of the larger export volume is due to more trade partners.[20] Column (3) and (4) show that the effects of judicial quality interaction on country-product-level export price and quality remain statistically insignificant.

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[17]Rajan and Zingales (1998) use such a specification to test whether industries that are more dependent on external finance grow faster in countries with better financial development. Romalis (2004) uses it to test whether a country abundant in a factor endowment specialises in industries intensively using that factor.

[18]The domestic absorption at the country-industry level is computed as a country's total CIF import value in an industry divided by the country's average import share in that industry.

[19]In columns (1) of Table D.9, the standardised beta coefficient of $\eta^g \times JQ_c$ is 0.506. In column (6) of Table VII in Nunn (2007a), the same coefficient is 0.520.

[20]Chan and Manova (2015) show that financial development also increases a country's number of export destinations relatively more for financially vulnerable industries.

The bottom panel of Table D.9 reports the results about different margins of imports. Column (1) shows that a country with better judicial quality has relatively lower total import share in contract-intensive industries.[21] Column (2) further shows that such a country also imports from relatively fewer origin countries in contract-intensive industries. In columns (3) and (4), we also find that the effects of judicial quality interaction on import price and quality are significantly positive. To sum up, our main empirical findings still hold when we use alternative empirical specifications.

[Table D.9 here]

3.4 Controlling for Output Customisation

Producing customised output usually requires more customised input, so an industry or a product's contract intensity, which measures its degree of input customisation, is often correlated with its degree of output customisation. To control for any effects of judicial quality that differ by output customisation, we re-estimate our empirical results separately for customised industries/products and standardised industries/products. We use the classification from Rauch (1999a) to define customised products at the SITC 4-digit product level and customised industries at the BEA I-O industry level.[22] This exercise is essential for two reasons. First, our findings should hold after we control for any effects of judicial quality

[21] The total import share used in Table D.9 only varies at the WIOD sector level for each country, usually more aggregate than the BEA I-O industry level. This is due to the data limitation in computing industry-level domestic absorption for different countries. We thus view this result as only suggestive. The statistically significant Hansen J value may again be a symptom of heterogeneity in the underlying coefficients.

[22] If an SITC 4-digit product is classified as "sold on an organised exchange" or "reference priced" according to Rauch's classification, we define it as "standardised". Otherwise, we define it as "customised". If for a BEA I-O industry, over 85% of its SITC 4-digit products are classified as customised products, we define the industry as "customised". Otherwise, we define it as "standardised".

that vary by output customisation. Second, our findings should be more pronounced for customised industries and products because they are more likely to use customised input.

Table D.10 presents the effects of judicial quality on trade patterns for customised and standardised industries separately, using legal origin as the instrument. The top panel reports the effects on exports, and the bottom panel reports the effects on imports. For each specification, we report the estimated coefficient of judicial quality interaction, standard error, K-P F statistic, p-value of Hansen J, and number of observations. The effects of exporter's judicial interaction on trade share are all significantly positive for customised industries but all statistically insignificant for standardised industries. Meanwhile, the effects of importer's judicial quality interaction are all significantly negative for customised industries, but all statistically insignificant for standardised industries.

[Table D.10 here]

Table D.11 reports the effects of judicial quality on trade price and quality for customised and standardised products separately. The effects of exporter's judicial quality interaction on price and quality are mostly statistically insignificant for both types of products.[23] Meanwhile, the effects of importer's judicial quality interaction on price and quality are mostly significantly positive for customised products and all statistically insignificant for standardised products.[24] Overall, aligned with our conjecture, all of our empirical findings hold for customised industries and products, but are less relevant for standardised industries and products.

[Table D.11 here]

[23]Only columns (4) and (5) show significantly negative estimates at the 10% level for customised products.
[24]The t-statistic of importer's interaction in column (3) of Table D.11 for customised products is 1.38, close to the critical value of 10% significance level.

3.5 Robustness: Panel Data Results about Quality with Different Estimates of σ

Using the demand-side approach proposed by Khandelwal *et al.* (2013), we construct three quality measures by using different values of σ. $Quality_1$ assumes that $\sigma = 5$ for all products (Anderson and Van Wincoop, 2004). $Quality_2$ uses estimates at the SITC 4-digit-unit level from Feenstra and Romalis (2014b), σ^{FR}. $Quality_3$ uses estimates at the SITC 4-digit level from Broda and Weinstein (2006b), σ^{BW}.

We provide some summary statistics of different estimates of σ and the ensuing demand-side quality indexes in Table D.12. σ^{FR} and σ^{BW} both exhibit substantial dispersion across products. The median values of σ^{FR} and σ^{BW} are 5.805 and 2.659, with their interquartile ranges (75th percentile minus 25th percentile) being 3.921 and 2.631, respectively. The correlation between σ^{FR} and σ^{BW} is only -0.014, and the ensuing quality measures $Quality_2$ and $Quality_3$ exhibit a correlation of 0.437.[25]

[Table D.12 here]

Columns 3 and 6 in the bottom panel of Table 6 in the main paper report the empirical results for panel data using $Quality_2$ as the outcome variable. For robustness, we replicate the estimation in these two columns using $Quality_1$ and $Quality_3$ as the outcome variables. The results are shown in Table D.13. Consistent with the findings in the bottom panel in Table 6, the estimated coefficients of the exporter's judicial quality interaction ($\eta^g \times JQ_{o,t}$) are statistically insignificant, while those of the importer's judicial quality interaction ($\eta^g \times JQ_{d,t}$)

[25] According to Feenstra and Romalis (2014a), there are three possible reasons that cause the difference between σ^{FR} and σ^{BW}: First, Feenstra and Romalis (2014a) use worldwide trade data for estimation, while Broda and Weinstein (2006a) use data for the United States. Second, Feenstra and Romalis (2014a) correct for quality in their estimation. Third, the two papers use different empirical specifications to estimate σ.

are positive and statistically significant at the 1% level. So our results for panel data are robust to quality measures inferred using different estimates of elasiticity of substitution σ.

[Table D.13 here]

3.6 Results for the Quasi-Heckscher-Ohlin & -Rybczynski Effects

Similar to Figure 3 in the main paper, we can visualise the Heckscher-Ohlin effect of judicial quality by comparing different exporters' shares in world trade across industries with different contract intensities in 1997 (Romalis, 2004). Figure E.3 depicts the estimated shares of world imports from Germany and India, for industries with contract intensities ranging from 0.2 to 0.9, using non-parametric estimation technique. Consistent with our theory, countries with better contracting environment, such as Germany who ranked No.14 out of 200 economies on the "rule of law" measure in 1997, acquire much larger shares in high-η industries, and much smaller shares in low-η industries. In contrast, India ranked No.76 on the "rule of law" measure in 1997, so its exports concentrated in low-η industries. Following Romalis (2004), we use a first-difference specification to detect the Rybczynski effect:

$$\Delta y^g_{do,t} = \gamma_{E1} \cdot \Delta JQ_{o,t} \times \eta^g + \gamma_{E2} \cdot \Delta H_{o,t} \times h^g_t + \gamma_{E3} \cdot \Delta K_{o,t} \times k^g_t$$
$$+\zeta^g_{d,t} + \zeta_{o,t} + \mathbf{X}^g_{o,t} + \mathbf{B}^g_{do,t} + \varepsilon^g_{Edo,t}, \qquad \text{(C.2)}$$

where $\Delta y^g_{do,t}$ denotes changes in the bilateral trade outcomes. $\Delta JQ_{o,t}$, $\Delta H_{o,t}$, and $\Delta K_{o,t}$ are changes in exporter o's judicial quality, skill and capital endowments, respectively. Importer-industry-year and exporter-year fixed effects are included to control for all industry-year-specific demand-side factors and the effects of an exporters time-varying characteristics. The

Rybczynski effect indicates that γ_{E1}, γ_{E2}, and γ_{E3} are all positive. We construct two first-difference panel samples at different frequencies. Panel data A contains year-to-year changes during 1997-2011. Panel data B contains five-year changes constructed using the original data in 1997, 2002, 2007, and 2012.[26] Panel B is less subject to measurement error of the changes in "rule of law" indicator over short year-to-year periods. Following Nunn (2007a), all explanatory variables are standardised to directly compare their relative importance.

According to Table D.14, the estimation results using panel data A and B tend to suggest that countries gradually improving their contracting environments also increase specialisations in contract-intensive industries. In addition, the coefficients of judicial quality interaction obtained using panel data B are 3.2-6 times larger than those obtained using panel data A. Therefore, the variations in the "rule of law" indicator across years seem more informative over longer periods of time.

[Table D.14 here]

Similar to the findings in Romalis (2004), the coefficients of physical capital interaction are significant at least at the 5% level, while the coefficients of human capital interaction are statistically insignificant. There are a few plausible reasons for the insignificant human capital interaction coefficient. For example, Romalis (2004) suggests that "*the human capital measures may not work well because years of formal education take no account of education quality, and because formal education accounts for only a fraction of human capital development*". Schott (2004) also argues that the U.S. trading partners specialise within products rather than across products, especially for the skill-intensive machinery sector. Finally,

[26]Information of all variables can be easily extended to 2012 except for tariff. So we use 2011 tariff data as proxies for 2012 tariff data.

the correlations between skill intensity and other industry characteristics may also lead to inconclusive results.

4 Appendix D: Supplementary Tables

Table D.1. *Summary statistics of key variables*

Variable	Obs.	Mean	Std. Dev.	Min	Max
FOB value (in 1,000 USD), X^g_{do}	453,948	9,077.87	105,938	24.62	2.88×10^7
CIF value (in 1,000 USD), X^g_{do}	453,948	9,270.12	106,477.7	37.88	2.66×10^7
Number of varieties	453,948	1.80	1.99	1	45
Log FOB share, $\ln\pi^g_{do}$	449,318	-5.56	2.31	-15.52	-0.02
Log CIF share, $\ln\pi^g_{do}$	449,318	-5.55	2.31	-15.49	-0.02
Log variety share	449,318	-4.28	1.16	-9.85	-0.02
FOB price, p^g_{do}	816,783	3.54	433.30	1.46×10^{-7}	1.50×10^5
CIF price, p^g_{do}	816,783	3.36	399.38	1.42×10^{-7}	1.38×10^5
Log FOB price, $\ln p^g_{do}$	816,783	-4.84	2.18	-15.74	11.92
Log CIF price, $\ln p^g_{do}$	816,783	-4.80	2.15	-15.77	11.84
Log FR export quality	816,783	-4.24	1.91	-14.19	11.41
Log FR import quality	816,783	-2.68	1.42	-10.48	9.81
Judicial quality, JQ_o	144	0.51	0.21	0.14	0.97
Log human capital, H_o	70	-1.68	1.14	-4.52	0.93
Log capital/worker, K_o	70	-4.74	1.33	-8.58	-2.96
Contract intensity, η^g	183	0.56	0.24	0.04	0.99
Skill intensity, h^g	153	0.40	0.14	0.16	0.85
Capital intensity, k^g	153	0.86	0.52	0.21	3.57

Note: "FR" stands for Feenstra and Romalis (2014a).

Table D.2. *The effects of judicial quality on trade patterns, IV, reduced form*

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable (log):	FOB share	CIF share	Variety	FOB share	CIF share	Variety
Interactions, exporter:						
British origin: $\eta^g \times B_o$	0.175**	0.179**	0.043*			
	(0.081)	(0.081)	(0.022)			
German origin: $\eta^g \times G_o$	0.290***	0.287***	0.040*			
	(0.097)	(0.096)	(0.023)			
Scandinavian origin: $\eta^g \times S_o$	0.125*	0.125*	0.051***			
	(0.069)	(0.069)	(0.008)			
Skill: $h^g \times H_o$	0.216***	0.214**	0.041**			
	(0.081)	(0.081)	(0.016)			
Capital: $k^g \times K_o$	0.011	0.020	0.088***			
	(0.103)	(0.104)	(0.023)			
Interactions, importer:						
British origin: $\eta^g \times B_d$				-0.022	-0.018	0.027
				(0.028)	(0.028)	(0.023)
German origin: $\eta^g \times G_d$				-0.044*	-0.045*	-0.065***
				(0.025)	(0.025)	(0.022)
Scandinavian origin: $\eta^g \times S_d$				-0.057***	-0.056***	-0.069***
				(0.013)	(0.013)	(0.014)
Skill: $h^g \times H_d$				-0.119***	-0.119***	-0.084***
				(0.032)	(0.032)	(0.028)
Capital: $k^g \times K_d$				-0.191***	-0.189***	-0.080**
				(0.041)	(0.041)	(0.030)
Bilateral controls	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Importer-industry, Exporter			Exporter-industry, Importer		
Within R-squared	0.180	0.178	0.086	0.245	0.244	0.079
Number of Obs.	227,054	227,054	227,054	181,461	181,461	181,461

Note: This table reports the effect of country-level legal origin on the trade pattern across industries with different contract intensities. Columns (1) to (3) present the reduced form results of exports. Columns (4) to (6) present the reduced form results of imports. Bilateral controls include tariff, bilateral distance, shared border, common official language, colonial tie, common currency union, and common FTA. Additional controls include the financial interaction, the interactions of log per capita income with value-added share, intra-industry trade share, production complexity, and TFP growth. Standard errors (clustered at the exporter level in columns (1) to (3); clustered at the importer level in columns (4) to (6)) are shown in parentheses. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels.

Table D.3. *The effects of judicial quality on trade prices and quality, IV, reduced form*

Dependent variable (log):	(1) FOB price	(2) CIF price	(3) Quality	(4) FOB price	(5) CIF price	(6) Quality
Interactions, exporter:						
British origin: $\eta^g \times B_o$	-0.054*	-0.060**	-0.050*			
	(0.029)	(0.029)	(0.026)			
German origin: $\eta^g \times G_o$	-0.047	-0.049	-0.043			
	(0.043)	(0.045)	(0.040)			
Scandinavian origin: $\eta^g \times S_o$	0.028	0.028	0.026			
	(0.022)	(0.022)	(0.020)			
Skill: $h^g \times H_o$	0.001	-0.0002	0.001			
	(0.022)	(0.022)	(0.019)			
Capital: $k^g \times K_o$	-0.167***	-0.166***	-0.154***			
	(0.034)	(0.035)	(0.031)			
Interactions, importer:						
British origin: $\eta^g \times B_d$				0.026*	0.022	0.016*
				(0.014)	(0.014)	(0.009)
German origin: $\eta^g \times G_d$				0.038***	0.039***	0.019**
				(0.013)	(0.012)	(0.008)
Scandinavian origin: $\eta^g \times S_d$				0.009	0.012*	0.002
				(0.007)	(0.007)	(0.004)
Skill: $h^g \times H_d$				0.014	0.014	0.016**
				(0.010)	(0.010)	(0.007)
Capital: $k^g \times K_d$				-0.080***	-0.067***	-0.038**
				(0.024)	(0.023)	(0.016)
Bilateral controls	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Importer-product, Exporter			Exporter-product, Importer		
Within R-squared	0.022	0.024	0.030	0.027	0.029	0.055
Number of Obs.	452,659	452,659	452,659	376,428	376,428	376,428

Note: This table reports the effect of country-level legal origin on the trade price and quality across products with different contract intensities. Columns (1) to (3) present the reduced form results of exports. Columns (4) to (6) present the reduced form results of imports. Bilateral controls include tariff, bilateral distance, shared border, common official language, colonial tie, common currency union, and common FTA. Additional controls include the financial interaction, the interactions of log per capita income with value-added share, intra-industry trade share, production complexity, and TFP growth. Standard errors (clustered at the exporter level in columns (1) to (3); clustered at the importer level in columns (4) to (6)) are shown in parentheses. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels.

Table D.4. *The effects of judicial quality on trade patterns, IV, first stage*

	(1)	(2)
Dependent variable :	Exporter's judicial interaction	Importer's judicial interaction
Interactions, exporter:		
British origin: $\eta^g \times B_o$	0.164***	
	(0.061)	
German origin: $\eta^g \times G_o$	0.142**	
	(0.057)	
Scandinavian origin: $\eta^g \times S_o$	0.157***	
	(0.029)	
Interactions, importer:		
British origin: $\eta^g \times B_d$		0.172***
		(0.063)
German origin: $\eta^g \times G_d$		0.158***
		(0.043)
Scandinavian origin: $\eta^g \times S_d$		0.188***
		(0.023)
Controls	Yes	Yes
Fixed effects	Importer-industry, Exporter	Exporter-industry, Importer
Number of Obs.	227,054	181,461

Note: This table reports the effect of country-level judicial quality on the trade pattern across industries with different contract intensities, using legal origin to instrument for country-level judicial quality. Columns (1) presents the first stage results of exports. Columns (2) presents the first stage results of imports. Controls include the skill interaction, capital interaction, all bilateral controls, and all additional controls. Standard errors (clustered at the exporter level in column (1); clustered at the importer level in column (2)) are shown in parentheses. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels.

Table D.5. *The effects of judicial quality on trade prices and quality, IV, first stage*

	(1)	(2)
Dependent variable :	Exporter's judicial interaction	Importer's judicial interaction
Interactions, exporter:		
British origin: $\eta^g \times B_o$	0.168***	
	(0.059)	
German origin: $\eta^g \times G_o$	0.130**	
	(0.054)	
Scandinavian origin: $\eta^g \times S_o$	0.137***	
	(0.027)	
Interactions, importer:		
British origin: $\eta^g \times B_d$		0.181***
		(0.062)
German origin: $\eta^g \times G_d$		0.150***
		(0.042)
Scandinavian origin: $\eta^g \times S_d$		0.182***
		(0.023)
Controls	Yes	Yes
Fixed effects	Importer-product, Exporter	Exporter-product, Importer
Number of Obs.	452,659	376,428

Note: This table reports the effect of country-level judicial quality on the trade price and quality across products with different contract intensities, using legal origin to instrument for country-level judicial quality. Column (1) presents the first stage results of exports. Column (2) presents the first stage results of imports. Controls include the skill interaction, capital interaction, all bilateral controls, and all additional controls. Standard errors (clustered at the exporter level in column (1); clustered at the importer level in column (2)) are shown in parentheses. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels.

Table D.6. *Alternative judicial quality and contract intensity measures, trade patterns*

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable (log):	FOB share	CIF share	Variety	FOB share	CIF share	Variety
	η^g: "Conservative"			η^g: "Liberal"		
Exporter's judicial interaction:						
JQ_o: Rule of law	1.121**	1.126**	0.293**	1.061**	1.065**	0.290**
	(0.433)	(0.433)	(0.127)	(0.404)	(0.404)	(0.125)
K-P F stat.	11.805	11.805	11.805	11.844	11.844	11.844
Hansen J p-value	0.341	0.342	0.903	0.319	0.317	0.961
JQ_o: Legal quality	1.004**	1.010**	0.280**	0.958**	0.964**	0.279**
	(0.424)	(0.425)	(0.118)	(0.396)	(0.397)	(0.117)
K-P F stat.	12.987	12.987	12.987	13.081	13.081	13.081
Hansen J p-value	0.332	0.331	0.935	0.295	0.292	0.990
JQ_o: WB official cost	1.050**	1.043**	0.275***	0.906*	0.898*	0.256**
	(0.510)	(0.508)	(0.103)	(0.462)	(0.460)	(0.100)
K-P F stat.	13.469	13.469	13.469	13.676	13.676	13.676
Hansen J p-value	0.128	0.123	0.451	0.077	0.073	0.357
Importer's judicial interaction:						
JQ_d: Rule of law	-0.254**	-0.248**	-0.249***	-0.180*	-0.174*	-0.190**
	(0.102)	(0.101)	(0.093)	(0.099)	(0.098)	(0.084)
K-P F stat.	25.226	25.226	25.226	25.361	25.361	25.361
Hansen J p-value	0.658	0.583	0.017	0.829	0.770	0.015
JQ_d: Legal quality	-0.243**	-0.235**	-0.216**	-0.176*	-0.168*	-0.165*
	(0.101)	(0.099)	(0.092)	(0.098)	(0.097)	(0.085)
K-P F stat.	25.263	25.263	25.263	25.412	25.412	25.412
Hansen J p-value	0.549	0.466	0.009	0.788	0.709	0.010
JQ_d: WB official cost	-0.374***	-0.374***	-0.495***	-0.261**	-0.262**	-0.411***
	(0.133)	(0.132)	(0.164)	(0.121)	(0.120)	(0.139)
K-P F stat.	9.282	9.282	9.282	9.228	9.228	9.228
Hansen J p-value	0.954	0.986	0.404	0.887	0.945	0.331

Note: This table reports the effect of country-level judicial quality on the trade pattern across industries with different contract intensities, using legal origin to instrument for country-level judicial quality. Different measures of judicial quality and contract intensity are used. Standard errors (clustered at the exporter level for exporter regressions; clustered at the importer level for importer regressions) are shown in parentheses. Kleibergen-Paap F statistics and p-values of Hansen J statistics are also reported. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels.

Table D.7. *Alternative judicial quality and contract intensity measures, trade prices and quality*

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable (log):	FOB price	CIF price	Quality	FOB price	CIF price	Quality
	η^g: "Conservative"			η^g: "Liberal"		
Exporter's judicial interaction:						
JQ_o: Rule of law	-0.123	-0.138	-0.111	-0.170	-0.187	-0.153
	(0.150)	(0.154)	(0.137)	(0.140)	(0.145)	(0.128)
K-P F stat.	10.373	10.373	10.373	10.477	10.477	10.477
Hansen J p-value	0.067	0.058	0.062	0.071	0.061	0.066
JQ_o: Legal quality	-0.098	-0.113	-0.089	-0.144	-0.159	-0.128
	(0.142)	(0.146)	(0.129)	(0.134)	(0.139)	(0.122)
K-P F stat.	10.747	10.747	10.747	10.829	10.829	10.829
Hansen J p-value	0.062	0.052	0.056	0.064	0.054	0.059
JQ_o: WB official cost	0.048	0.048	0.045	0.016	0.015	0.015
	(0.163)	(0.167)	(0.150)	(0.156)	(0.161)	(0.144)
K-P F stat.	14.143	14.143	14.143	14.340	14.340	14.340
Hansen J p-value	0.024	0.017	0.022	0.014	0.010	0.013
Importer's judicial interaction:						
JQ_d: Rule of law	0.118**	0.124**	0.057*	0.141***	0.144***	0.069**
	(0.052)	(0.051)	(0.034)	(0.053)	(0.052)	(0.034)
K-P F stat.	22.673	22.673	22.673	22.413	22.413	22.413
Hansen J p-value	0.103	0.127	0.071	0.091	0.110	0.056
JQ_d: Legal quality	0.111**	0.116**	0.054	0.132**	0.134**	0.066*
	(0.052)	(0.053)	(0.034)	(0.054)	(0.054)	(0.034)
K-P F stat.	23.017	23.017	23.017	22.679	22.679	22.679
Hansen J p-value	0.134	0.182	0.083	0.117	0.156	0.065
JQ_d: WB official cost	0.131**	0.150**	0.054	0.159**	0.175***	0.068*
	(0.058)	(0.058)	(0.037)	(0.065)	(0.064)	(0.040)
K-P F stat.	10.304	10.304	10.304	9.898	9.898	9.898
Hansen J p-value	0.026	0.027	0.023	0.025	0.031	0.016

Note: This table reports the effect of country-level judicial quality on the trade price and quality across products with different contract intensities, using legal origin to instrument for country-level judicial quality. Different measures of judicial quality and contract intensity are used. Standard errors (clustered at the exporter level for exporter regressions; clustered at the importer level for importer regressions) are shown in parentheses. Kleibergen-Paap F statistics and p-values of Hansen J statistics are also reported. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels.

Table D.8. *The effects of judicial quality on trade prices, HS 6-digit level*

Dependent variable (log): price	(1) OLS	(2) IV	(3) OLS	(4) IV
Interactions, exporter:				
Judicial quality: $\eta^g \times JQ_o$	0.005	-0.083		
	(0.029)	(0.138)		
Skill: $h^g \times H_o$	-0.009	-0.006		
	(0.021)	(0.021)		
Capital: $k^g \times K_o$	-0.160***	-0.187***		
	(0.036)	(0.056)		
Interactions, importer:				
Judicial quality: $\eta^g \times JQ_d$			0.595***	1.399***
			(0.072)	(0.482)
Skill: $h^g \times H_d$			0.032	-0.012
			(0.052)	(0.074)
Capital: $k^g \times K_d$			-0.044	0.269
			(0.075)	(0.220)
Bilateral controls	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes
Fixed effects	Importer-product Exporter		Exporter-product Importer	
Kleibergen-Paap LM stat.		11.655***		19.888***
Kleibergen-Paap F stat.		7.611		18.391
Hansen J stat. (p-value)		0.054		0.004
Number of Obs.	1,412,197	1,412,197	1,241,498	1,241,498

Note: This table reports the effect of country-level judicial quality on the trade price across products with different contract intensities with bilateral trade data at the HS 6-digit level. In columns (2) and (4), we use legal origin to instrument for country-level judicial quality and present the second stage results. Columns (1) to (2) present results of exports, while columns (3) and (4) present results of imports. Bilateral controls include tariff, bilateral distance, shared border, common official language, colonial tie, common currency union, and common FTA. Additional controls include the financial interaction, the interactions of log per capita income with value-added share, intra-industry trade share, production complexity, and TFP growth. Standard errors (clustered at the exporter-industry level in column (1); at the exporter level in column (2); at the importer-industry level in column (3); at the importer level in column (4)) are shown in parentheses. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels.

Table D.9. *Alternative specification: country level*

	(1)	(2)	(3)	(4)
Dependent variable (log):	Export value	Export # of destinations	Export price	Export quality
Judicial quality: $\eta^g \times JQ_c$	1.499***	0.716***	-0.093	0.017
	(0.407)	(0.152)	(0.076)	(0.063)
Skill: $h^g \times H_c$	0.216*	0.164***	-0.025	0.024
	(0.117)	(0.051)	(0.029)	(0.036)
Capital: $k^g \times K_c$	0.646**	0.287***	-0.227***	-0.163***
	(0.261)	(0.098)	(0.048)	(0.060)
Additional controls	Yes	Yes	Yes	Yes
Fixed effects	Country, Industry		Country, Product	
Kleibergen-Paap LM stat.	16.753***	16.753***	16.739***	16.739***
Kleibergen-Paap F stat.	34.448	34.448	22.537	22.537
Hansen J stat. (p-value)	0.291	0.449	0.113	0.663
Number of Obs.	7,702	7,702	26,677	26,677
	(1)	(2)	(3)	(4)
Dependent variable (log):	Import share	Import # of origins (normalised)	Import price	Import quality
Judicial quality: $\eta^g \times JQ_c$	-0.166**	-0.313***	0.148***	0.089***
	(0.076)	(0.114)	(0.033)	(0.022)
Skill: $h^g \times H_c$	-0.027	-0.055	0.001	-0.008
	(0.019)	(0.036)	(0.011)	(0.007)
Capital: $k^g \times K_c$	-0.173***	-0.278**	-0.039	-0.024
	(0.044)	(0.106)	(0.025)	(0.017)
Additional controls	Yes	Yes	Yes	Yes
Fixed effects	Country, Industry		Country, Product	
Kleibergen-Paap LM stat.	14.612***	14.612***	16.003***	16.003***
Kleibergen-Paap F stat.	41.216	41.216	37.584	37.584
Hansen J stat. (p-value)	0.025	0.812	0.125	0.211
Number of Obs.	9,298	9,298	36,755	36,755

Note: This table reports the effects of country-level judicial quality on trade margins across industries (products) with different contract intensities, using legal origin to instrument for country-level judicial quality. Additional controls include the financial interaction, the interactions of log per capita income with value-added share, intra-industry trade share, production complexity, and TFP growth. Standard errors (clustered at the country level) are shown in parentheses. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels.

Table D.10. *Customised industries and standardised industries, trade patterns*

Dependent variable (log):	(1) FOB share	(2) CIF share	(3) Variety	(4) FOB share	(5) CIF share	(6) Variety
	η^g: "Conservative"			η^g: "Liberal"		
Judicial interaction, exporter:			$\eta^g \times JQ_o$			
Customised industries	1.708***	1.709***	0.338***	1.458***	1.456***	0.326***
	(0.541)	(0.539)	(0.101)	(0.482)	(0.479)	(0.096)
K-P F stat.	11.860	11.860	11.860	11.926	11.926	11.926
Hansen J p-value	0.416	0.409	0.482	0.250	0.242	0.428
Number of Obs.	163,021	163,021	163,021	156,025	156,025	156,025
Standardised industries	-0.226	-0.244	0.088	0.112	0.095	0.157
	(0.675)	(0.676)	(0.138)	(0.651)	(0.651)	(0.156)
K-P F stat.	10.845	10.845	10.845	10.881	10.881	10.881
Hansen J p-value	0.252	0.253	0.269	0.363	0.355	0.265
Number of Obs.	64,033	64,033	64,033	71,029	71,029	71,029
Judicial interaction, importer:			$\eta^g \times JQ_d$			
Customised industries	-0.368**	-0.362**	-0.300***	-0.240*	-0.235*	-0.170*
	(0.151)	(0.149)	(0.107)	(0.138)	(0.136)	(0.087)
K-P F stat.	24.417	24.417	24.417	24.438	24.438	24.438
Hansen J p-value	0.775	0.753	0.166	0.693	0.662	0.101
Number of Obs.	128,092	128,092	128,092	122,751	122,751	122,751
Standardised industries	0.141	0.139	0.048	0.049	0.047	-0.051
	(0.319)	(0.320)	(0.308)	(0.244)	(0.244)	(0.207)
K-P F stat.	22.961	22.961	22.961	23.146	23.146	23.146
Hansen J p-value	0.128	0.125	0.089	0.129	0.130	0.123
Number of Obs.	53,369	53,369	53,369	58,710	58,710	58,710

Note: This table reports the effect of country-level judicial quality on the trade pattern across industries with different contract intensities, using legal origin to instrument for country-level judicial quality. Customised (standardised) industries are BEA I-O industries with $\geq$ 85% (< 85%) of SITC 4-digit products defined as customised products according to Rauch (1999b). Standard errors (clustered at the exporter level for exporter regressions; clustered at the importer level for importer regressions) are shown in parentheses. Kleibergen-Paap F statistics and p-values of Hansen J statistics are also reported. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels.

Table D.11. *Customised products and standardised products, trade prices and quality*

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable (log):	FOB price	CIF price	Quality	FOB price	CIF price	Quality
	η^g: "Conservative"			η^g: "Liberal"		
Judicial interaction, exporter:	$\eta^g \times JQ_o$					
Customised products	-0.187	-0.202	-0.166	-0.226*	-0.242*	-0.202
	(0.143)	(0.149)	(0.130)	(0.135)	(0.143)	(0.123)
K-P F stat.	10.747	10.747	10.747	10.823	10.823	10.823
Hansen J p-value	0.072	0.062	0.068	0.069	0.060	0.068
Number of Obs.	338,075	338,075	338,075	324,857	324,857	324,857
Standardised products	-0.036	-0.037	-0.024	-0.066	-0.068	-0.062
	(0.143)	(0.144)	(0.132)	(0.162)	(0.161)	(0.146)
K-P F stat.	8.365	8.365	8.365	9.022	9.022	9.022
Hansen J p-value	0.008	0.006	0.005	0.079	0.067	0.062
Number of Obs.	114,584	114,584	114,584	127,802	127,802	127,802
Judicial interaction, importer:	$\eta^g \times JQ_d$					
Customised products	0.077*	0.084**	0.033	0.108***	0.112***	0.048**
	(0.039)	(0.039)	(0.024)	(0.039)	(0.038)	(0.023)
K-P F stat.	23.414	23.414	23.414	23.200	23.200	23.200
Hansen J p-value	0.123	0.232	0.081	0.068	0.093	0.041
Number of Obs.	277,736	277,736	277,736	266,750	266,750	266,750
Standardised products	0.106	0.109	0.032	0.108	0.111	0.044
	(0.073)	(0.077)	(0.048)	(0.070)	(0.072)	(0.049)
K-P F stat.	20.383	20.383	20.383	20.818	20.818	20.818
Hansen J p-value	0.017	0.011	0.028	0.051	0.041	0.049
Number of Obs.	98,692	98,692	98,692	109,678	109,678	109,678

Note: This table reports the effect of country-level judicial quality on the trade price and quality across products with different contract intensities, using legal origin to instrument for country-level judicial quality. Customised (standardised) products are SITC 4-digit products defined as customised (standardised) products according to Rauch (1999b). Standard errors (clustered at the exporter level for exporter regressions; clustered at the importer level for importer regressions) are shown in parentheses. Kleibergen-Paap F statistics and p-values of Hansen J statistics are also reported. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels.

Table D.12. *Summary statistics of different estimates of* σ *and quality measures*

		Percentile:				
Variable	Obs.	5th	25th	50th	75th	95th
σ^{FR}: Feenstra and Romalis's (2014a) estimates	1,167	3.187	4.497	5.805	8.418	32.844
σ^{BW}: Broda and Weinstein's (2006a) estimates	579	1.302	1.886	2.659	4.517	25.032
$Quality_1$ (in log): inferred using $\sigma = 5$	816,783	-1.571	-0.594	0.015	0.608	1.512
$Quality_2$ (in log): inferred using σ^{FR}	816,783	-1.527	-0.574	0.011	0.579	1.493
$Quality_3$ (in log): inferred using σ^{BW}	748,561	-3.629	-1.111	-0.041	0.968	3.603

Note: This table reports the summary statistics of different estimates of σ and the corresponding demand-side quality indexes in 1997. σ^{FR} is at the SITC-4-digit-unit level, and σ^{BW} is at the SITC-4-digit level. The demand-side approach of inferring quality follows Khandelwal *et al.* (2013).

Table D.13. *Alternative measure of quality: demand-side approach, IV, 1997-2011 panel data*

Dependent variable (log):	(1) $Quality_1$ $\sigma = 5$	(2) $Quality_3$ σ^{BW}	(3) $Quality_1$ $\sigma = 5$	(4) $Quality_3$ σ^{BW}
Interactions, exporter:				
Judicial quality: $\eta^g \times JQ_{o,t}$	0.042	0.221		
	(0.055)	(0.142)		
Skill: $h_t^g \times H_{o,t}$	0.135**	0.859***		
	(0.052)	(0.200)		
Capital: $k_t^g \times K_{o,t}$	-0.249***	0.023		
	(0.078)	(0.237)		
Interactions, importer:				
Judicial quality: $\eta^g \times JQ_{d,t}$			0.074***	0.243***
			(0.025)	(0.089)
Skill: $h_t^g \times H_{d,t}$			0.023	0.550***
			(0.018)	(0.096)
Capital: $k_t^g \times K_{d,t}$			-0.029	-0.042
			(0.034)	(0.137)
Bilateral controls	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes
Fixed effects	Importer-product-year Exporter-year		Exporter-product-year Importer-year	
Kleibergen-Paap LM stat.	14.280***	14.384***	16.308***	16.420***
Kleibergen-Paap F stat.	24.495	24.587	48.424	49.462
Hansen J stat. (p-value)	0.054	0.317	0.605	0.521
Number of Obs.	8,387,964	7,786,644	7,815,443	7,256,675

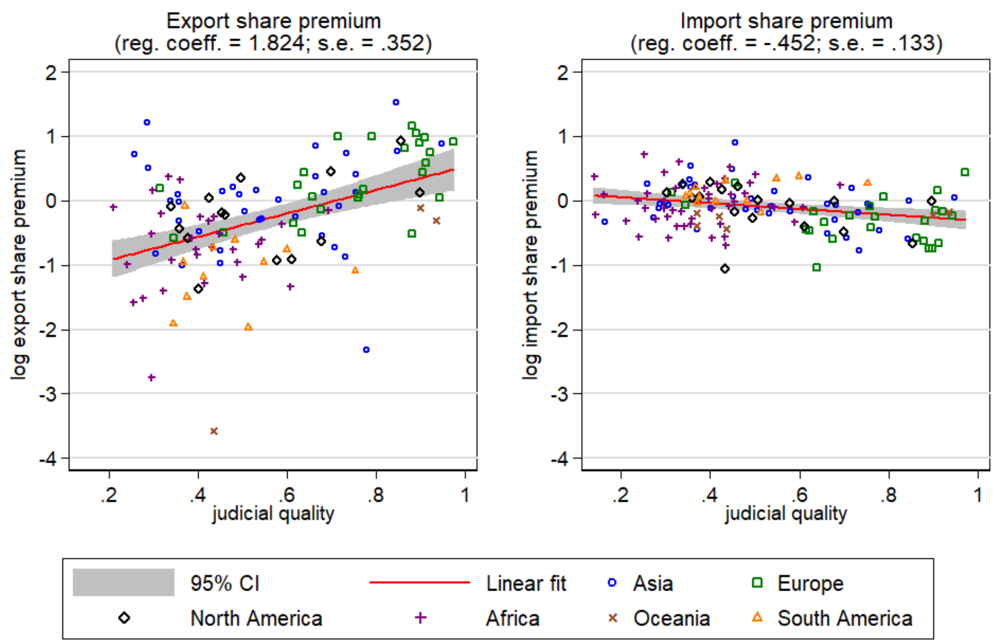
Note: This table re-estimates Tables 6 in the main text, using panel data during 1997-2011 and legal origins to instrument for country-level judicial quality. Trade quality is inferred from a CES preference. $Quality_1$ and $Quality_3$ are quality indexes inferred using $\sigma = 5$ and Broda and Weinstein's (2006a) estimates of σ, respectively. Columns (1) to (2) present the second stage results of exports. Columns (3) to (4) present the second stage results of imports. η^g is fixed in its 1997 value because this measure is not available in more recent years. All regressions control for bilateral variables (including tariff, bilateral distance, shared border, common official language, colonial tie, common currency union, and common FTA), and additional variables (including the financial interaction, the interactions of log per capita income with value-added share, intra-industry trade share, production complexity, and TFP growth). Standard errors (clustered at the exporter level in columns (1) to (2); clustered at the importer level in columns (3) to (4)) are shown in parentheses. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels.

Table D.14. *The Quasi-Rybczynski effect of growing judicial quality*

Panel Data A: 1997-2011	(1)	(2)	(3)
Dependent variable (log difference):	FOB share	CIF share	Variety
Interactions difference, exporter:			
Judicial quality: $\eta^g \times \Delta JQ_{o,t}$	0.006***	0.006***	0.0005
	(0.002)	(0.002)	(0.001)
Skill: $h^g_t \times \Delta H_{o,t}$	0.002	0.002	-0.001
	(0.003)	(0.003)	(0.001)
Capital: $k^g_t \times \Delta K_{o,t}$	0.010***	0.010***	0.003**
	(0.004)	(0.004)	(0.001)
Bilateral controls	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes
Fixed effects	Importer-industry-year		
	Exporter-year		
Within R-Squared	0.0001	0.0001	0.0001
Number of Obs.	3,528,441	3,528,441	3,528,441
Panel Data B: 1997, 2002, 2007, 2012	(1)	(2)	(3)
Dependent variable (log difference):	FOB share	CIF share	Variety
Interactions difference, exporter:			
Judicial quality: $\eta^g \times \Delta JQ_{o,t}$	0.036***	0.019**	0.007**
	(0.009)	(0.008)	(0.003)
Skill: $h^g_t \times \Delta H_{o,t}$	-0.007	0.014	-0.004
	(0.014)	(0.013)	(0.004)
Capital: $k^g_t \times \Delta K_{o,t}$	0.080***	0.057***	0.013**
	(0.017)	(0.016)	(0.006)
Bilateral controls	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes
Fixed effects	Importer-industry-year		
	Exporter-year		
Within R-Squared	0.002	0.001	0.001
Number of Obs.	603,161	603,161	603,161

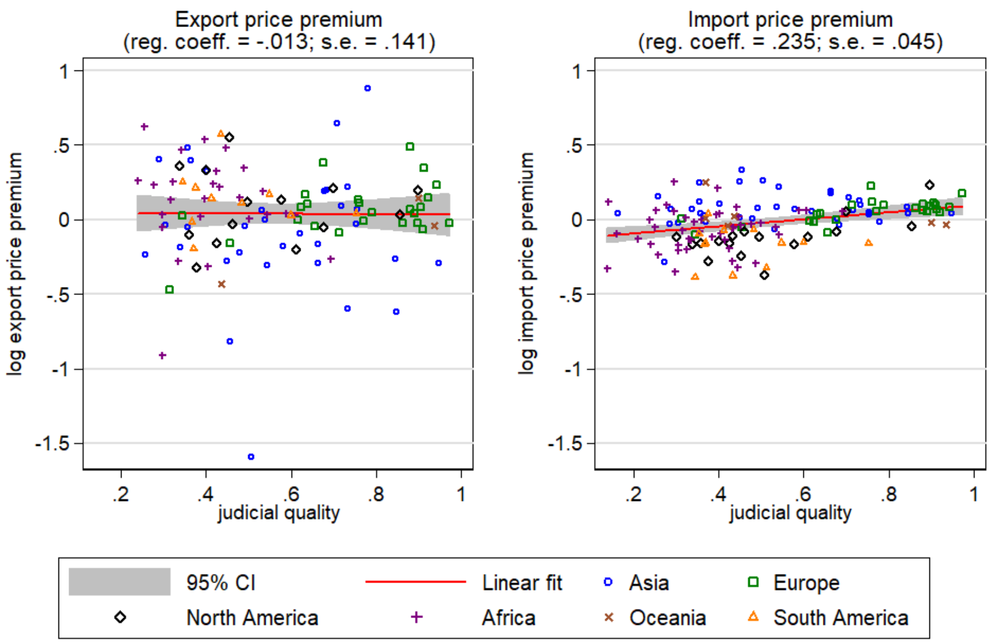
Note: This table reports the effects of growing country-level judicial quality on trade pattern across industries with different contract intensities, using OLS estimators since legal origin is time invariant. That is the quasi-Rybczynski effects of growing judicial quality. η^g is fixed in its 1997 value because this measure is not available in more recent years. Bilateral controls include tariff, bilateral distance, shared border, common official language, colonial tie, common currency union, and common FTA. Additional controls include the financial interaction, the interactions of log per capita income with value-added share, intra-industry trade share, production complexity, and TFP growth. Standard errors (clustered at the exporter-industry level) are shown in parentheses. *, **, and *** indicate significance at the 10 percent, 5 percent, and 1 percent levels.

5 Appendix E: Supplementary Figures



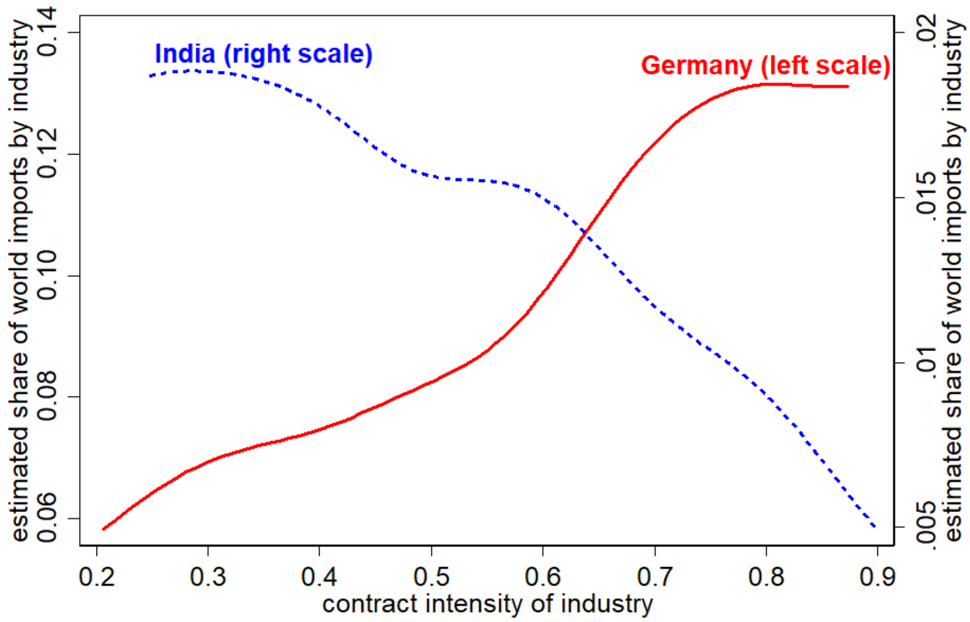
Note: Each dot is a country's export or import share premium in contract-intensive industries, calculated based on the top 25% and the bottom 25% contract-intensive industries. Different symbols represent different continents. Robust standard errors are used.

Figure E.1. *Trade share premium and judicial quality, alternative cutoff*



Note: Each dot is a country's export or import price premium in contract-intensive products, calculated based on the top 25% and the bottom 25% contract-intensive industries. Different symbols represent different continents. Robust standard errors are used.

Figure E.2. *Trade price premium and judicial quality, alternative cutoff*



Note: The solid line (left scale) is the estimated share of world imports by industry from Germany in 1997, with kernel density estimation and outliers removed. The dash line (right scale) is the estimated share for India. Fractional-polynomial fit generates similar results.

Figure E.3. *Heckscher-Ohlin effect for Germany and India: 1997*

Affiliations

[1]Institute of World Economics and Politics (IWEP), Chinese Academy of Social Sciences (CASS), Beijing 100732, China. Email: cuixiaomin@cass.org.cn.

[2]China Centre for Economic Research (CCER), National School of Development, Peking University, Beijing 100871, China. Email: mjyu@nsd.pku.edu.cn.

[3]Department of Economics and Business Economics, Research Centre for Firms and INdustry Dynamics (FIND), Aarhus University, 8210 Aarhus V, Denmark. Email: rayzhangrui23@econ.au.dk.

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