Unintended consequences:
can the rise of the educated class explain the revival of protectionism?

Paolo Giordani\textsuperscript{1}  Fabio Mariani\textsuperscript{2,3}

\textsuperscript{1}LUISS, Rome
\textsuperscript{2}IRES, Université Catholique de Louvain
\textsuperscript{3}IZA, Bonn

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Motivation and research question

Protectionism is on the rise in Western democracies: Brexit, US, Italy, etc.
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Trade

- has distributive effects (winners and losers), but
- brings about aggregate gains.
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- has distributive effects (winners and losers), but
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Why emptying the baby out with the bathwater?

Our politico-economic explanation: the (endogenous) rise of the educated class erodes the political support for redistribution, so that the losers from trade prefer protectionism
Our model: overview

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2. **political economy**: two-stage voting game on trade openness and redistribution;
Our model: overview

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1. a simple specific-factor trade model à la Ricardo-Viner (Jones, 1971; Mussa, 1974; Mayer, 1974; Neary, 1978) with distributive implications;

2. political economy: two-stage voting game on trade openness and redistribution;

3. dynamics: taxes finance a public good, which promotes human capital accumulation.
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1. political attitudes towards globalization:

2. determinants of populism:
   Guiso et al. (2017, 2018), Inglehart and Norris (2016)

3. distributive effects of trade:

4. human capital accumulation and inequality:
The economic environment: industries and agents

Two perfectly competitive industries:

- exporting \((X)\), and
- importing \((M)\).
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- exporting (X), and
- importing (M).

Population of unit mass:
- \( \lambda \in (1/2, 1) \) workers, and
- \( 1 - \lambda \) entrepreneurs.
Industries and agents

Entrepreneurs are *sector-specific*:

- $\gamma (1 - \lambda)$ in sector $X$ (denoted by $x$),
- $(1 - \gamma)(1 - \lambda)$ in sector $M$ (denoted by $m$).
Industries and agents

Entrepreneurs are *sector-specific*:

- \( \gamma (1 - \lambda) \) in sector \( X \) (denoted by \( x \)),
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As far as workers are concerned,

- \( \sigma \lambda \) are skilled (\( s \)) and perfectly mobile across industries,
- \( (1 - \sigma) \lambda \) are unskilled (\( u \)) and imperfectly mobile.
Production

Production in the two sectors takes place according to

$$Y_X = AP \left[ \gamma (1 - \lambda) \right]^{1-\alpha-\beta} \left[ \theta_s \sigma \lambda \right]^\alpha \left[ \theta_u (1 - \sigma) \lambda \right]^\beta$$  \hspace{1cm} (1)

and

$$Y_M = \left[ (1 - \gamma) (1 - \lambda) \right]^{1-\alpha-\beta} \left[ (1 - \theta_s) \sigma \lambda \right]^\alpha \left[ (1 - \theta_u) (1 - \sigma) \lambda \right]^\beta,$$  \hspace{1cm} (2)

where:

- $\theta_s$ and $\theta_u$ are (endogenous) labor shares (in $X$),
- $A \in \mathbb{R}_+$ is TFP in $X$,
- $P \in [\underline{P}, \overline{P}]$ is the relative price in sector $X$ ($\leftarrow$ proxy for trade openness, as in Grossman et al. (2017), etc.).
Factor allocation

Factors are paid their marginal productivity (MP). The allocation of workers $(\theta_s, \theta_u)$ is obtained from factor income equalization:

$$y_{M,i} = y_{X,i} \text{ for } i = s, u.$$
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For the skilled, \(MP_{M,s} = MP_{X,s}\).

Unskilled workers incur an access cost to sector \(X\), so that

\[
MP_{M,u} = \frac{MP_{X,u}}{\phi P},
\]

with \(\phi > 0\).
Trade and factor incomes

After finding $\theta_s^*$ and $\theta_u^*$, we can study how incomes depend on trade openness.
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**Lemma 1**

An increase in $P$ (i) raises $y_x$ and $y_s$, (ii) lowers $y_m$, and (iii) lowers $y_u$ as long as $\phi P > 1$. 
Assumption 1

Parameters are such that:

1. \( P > \beta_1 - \beta_A \)

2. \( P > \beta_1 - \beta_A - \alpha - \beta_1 \alpha \)

3. \( P < \beta_1 - \beta_A \)

The above restrictions on the parameter space allow us to “freeze” the ranking of incomes, thus simplifying the analysis.

Lemma 2

Under Assumption 1, we have \( y_x > y_m > y_s > y_u \).
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1. \( \sigma < \frac{\alpha}{\alpha + \beta} \);

2. \( \bar{P} > \frac{\phi^{1-\beta}}{A^{1-\beta}} \left( \frac{\alpha (1 - \lambda) (1 - \gamma)}{\lambda \sigma (1 - \alpha - \beta) - \alpha \gamma (1 - \lambda)} \right)^{\frac{1 - \alpha - \beta}{1 - \beta}} \);

3. \( \bar{P} < \frac{\phi^{1-\beta}}{A^{1-\beta}} \left( \frac{\lambda \sigma (1 - \alpha - \beta) - \alpha (1 - \gamma) (1 - \lambda)}{\alpha \gamma (1 - \lambda)} \right)^{\frac{1 - \alpha - \beta}{1 - \beta}} \).
Ranking of incomes

Assumption 1

Parameters are such that:

1. \( \sigma < \frac{\alpha}{\alpha + \beta} \);

2. \( P > \frac{\phi^\frac{\beta}{1-\beta}}{A^{\frac{1}{1-\beta}}} \left( \frac{\alpha (1 - \lambda) (1 - \gamma)}{\lambda \sigma (1 - \alpha - \beta) - \alpha \gamma (1 - \lambda)} \right)^{\frac{1-\alpha-\beta}{1-\beta}} \);

3. \( \overline{P} < \frac{\phi^\frac{\beta}{1-\beta}}{A^{\frac{1}{1-\beta}}} \left( \frac{\lambda \sigma (1 - \alpha - \beta) - \alpha (1 - \gamma) (1 - \lambda)}{\alpha \gamma (1 - \lambda)} \right)^{\frac{1-\alpha-\beta}{1-\beta}} \).

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3. \( \frac{1}{\bar{P}} < \frac{\phi^{1-\beta}}{A^{1-\beta}} \left( \frac{\lambda \sigma (1 - \alpha - \beta) - \alpha (1 - \gamma) (1 - \lambda)}{\alpha \gamma (1 - \lambda)} \right)^{\frac{1}{1-\beta}} \).

The above restrictions on the parameter space allow us to “freeze” the ranking of incomes, thus simplifying the analysis.

Lemma 2

*Under Assumption 1, we have* \( y_x, y_m > y_s > y_u \).
Setting up the problem

We consider a two-stage voting game, in which agents decide by majority on

1. trade openness \((P)\),
2. taxation \((\tau)\).
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Utility depends on consumption of private and public goods:

\[
U (c_X, c_M, G) = c_X^\mu c_M^{1-\mu} + \delta \ln G. \tag{4}
\]

with \(\mu \in (0, 1)\) and \(\delta > 0\).
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The government budget constraint is

\[
G = \tau Y, \tag{5}
\]

with \(Y = PY_X + Y_M\).
The preferred tax rate by agent $i = \{s, u, x, m\}$ is

$$
\tau_i^* = \frac{\delta \left( \frac{P}{1-\mu} \right)^{1-\mu} \left( \frac{1}{\mu} \right)^\mu}{y_i}.
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(6)
Political preferences over taxation

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Given Lemma 1, political preferences on taxation can be ranked as follows

**Lemma 3**

*Under Assumption 1, we have $\tau_u^* > \tau_s^* > \tau_m^*, \tau_x^*$.***
Voting on taxation

Political preferences are aggregated by majority voting, where $\tau^M$ is the preferred tax rate of the median voter.
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**Proposition 1**

The median voter on $\tau$ is always a worker, unskilled if $\lambda (1 - \sigma) \geq 1/2$ and skilled otherwise, i.e.

$$
\tau^M = \begin{cases} 
\tau_u^* & \text{if } \sigma \leq 1 - \frac{1}{2\lambda} \\
\tau_s^* & \text{if } \sigma > 1 - \frac{1}{2\lambda}.
\end{cases}
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Let us define

$$\sigma' \equiv 1 - \frac{1}{2\lambda}.$$
Political preferences over trade openness

Individual attitudes towards $P$ are formed by taking into account the outcome of the vote on $\tau$. 
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**Lemma 4**

*We have the following ranking of preferences over trade openness (across types):*

$$P_x^*(\tau^M) > P_s^*(\tau^M) > P_u^*(\tau^M) > P_m^*(\tau^M).$$
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**Lemma 4**

*We have the following ranking of preferences over trade openness (across types):*

$$P^*_x(\tau^M) > P^*_s(\tau^M) > P^*_u(\tau^M) > P^*_m(\tau^M).$$

In the absence of adequate redistribution, the losers from trade would like to reduce trade openness.

**Lemma 5**

*Unskilled workers become more hostile to trade when the median voter on $\tau$ becomes a skilled worker, i.e. $P^*_u(\tau^*_s) < P^*_u(\tau^*_u)$.***
Voting on trade openness

Preferences on trade openness are also aggregated by majority voting.
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Proposition 2

The median voter on \( P \) is always a worker, unskilled if
\[
\lambda (1 - \sigma) + (1 - \lambda) (1 - \gamma) \geq 1/2 \quad \text{and skilled otherwise, i.e.}
\]

\[
P^M = \begin{cases} 
P_u^* & \text{if } \sigma \leq \frac{1}{2\lambda} - \frac{\gamma (1 - \lambda)}{\lambda} \\
1 & \text{if } \sigma > \frac{1}{2\lambda} - \frac{\gamma (1 - \lambda)}{\lambda}
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Voting on trade openness

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$$\sigma'' \equiv \frac{1}{2\lambda} - \frac{\gamma (1 - \lambda)}{\lambda}.$$
The political equilibrium

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Proposition 3

The political equilibrium is such that

$$(P^M; M) =
\begin{cases}
(P^* u^* u^*); & \text{if } \sigma \leq \sigma' \text{ (reg. 1)} \\
(P^* u^* s^* s^*); & \text{if } \sigma' < \sigma \leq \sigma'' \text{ (reg. 2)} \\
(P^* s^* s^* s^*); & \text{if } \sigma > \sigma'' \text{ (reg. 3)}
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The political equilibrium

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The political equilibrium is such that

$$
(P^M, \tau^M) = \begin{cases} 
(P_u^*(\tau_u^*), \tau_u^*) & \text{if } \sigma \leq \sigma' \text{ (reg. 1)} 
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Human capital accumulation (social mobility)

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$$\sigma_{t+1} = \pi^{SS} \sigma_t + \pi^{US} (1 - \sigma_t),$$

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where $\pi^{SS}$ ($\pi^{US}$) is the probability that a skilled (unskilled) worker has a skilled offspring.
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$$\pi^{SS} = (1 - \zeta) \chi^{SS} + \zeta \frac{\eta G_t}{1 + G_t},$$  \hspace{1cm} (11)

and

$$\pi^{US} = (1 - \zeta) \chi^{US} + \zeta \frac{\eta G_t}{1 + G_t},$$  \hspace{1cm} (12)

where $\zeta \in (0, 1)$, $\eta \in R_+$ and $\chi^{SS} > \chi^{US}$. 

Unintended consequences
The transition function

For simplicity, we restrict trade policy to a binary choice, so that $P \in \{\overline{P}, \overline{P}\}$. 
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The transition function for $\sigma$ is given by

$$
\sigma_{t+1} = \begin{cases} 
  f_1(\sigma_t) & \text{if } \sigma_t \leq \sigma' \\
  f_2(\sigma_t) & \text{if } \sigma' < \sigma_t \leq \sigma'' \\
  f_3(\sigma_t) & \text{if } \sigma_t > \sigma''
\end{cases}
$$

where $f_i(\sigma_t)$ depends on the specific political equilibrium prevailing at time $t$. 

(13)
Example: protectionist SS

\[ \sigma_{t+1} = \sigma_t \]

\[ \sigma_{t+1} = f(\sigma_t) \]

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Unintended consequences
Example: free-trade SS

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\[ \sigma_{t+1} = f(\sigma_t) \]

(1) \( \sigma' \)

(2) \( \sigma'' \)

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Conclusions

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- which in turn weakens the political support for redistribution,
Conclusions

We have analyzed an economy in which citizens vote on redistribution and trade openness.

Protectionism arises endogenously as a by-product of the lower level of redistribution commanded by an ever more educated working population.

In our model, globalization breeds its decline:
- because it helps the emergence of the educated class,
- which in turn weakens the political support for redistribution,
- thus increasing the demand for protectionism.
The rise of the educated class (OECD)

Source: own elaborations on OECD data
Trade Openness and Social Expenditure (OECD)

Source: own elaborations on OECD data

Trade Openness and Welfare State

- Social Expenditure % GDP
- Trade %GDP
Globalization and redistribution (or the lack thereof)

OECD countries: trade openness and social expenditure

Source: own elaborations on OECD data
Inequality before and after redistribution (Europe Vs. US)

Source: Blanchet et al. (2019)
Inequality before and after redistribution (OECD)

Source: own elaborations on OECD data