INEQUALITY:
A HIDDEN COST OF MARKET POWER

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The opinions expressed and arguments employed herein are those of the authors and do not necessarily reflect the official views of the OECD or OECD member countries.
Motivation

• Recent research on inequality in the distribution of wealth and income:
  – Piketty and Saez (2003), Urzúa (2013) and Summers (2014)
Motivation

- Increasing disparity in the distribution of income in several OECD countries:
  - Top 1% holds ≈ 5% of the income
  - Top 10% holds ≈ 25% of the income
Motivation

- Inequality is even more accentuated in the distribution of wealth!
  - Top 1% holds ≈ 15% of the wealth (except US)
  - Top 10% holds ≈ 50% of the wealth (except US)
Motivation

The focus of research on inequality allows us to better understand the mechanisms behind income and wealth inequality.

By understanding the sources of inequality, public policies can be designed appropriately to promote inclusive growth.
Sources of Inequality

• **Traditional explanations for observed inequality**
  – Differences in human capital value
  – Wage discrimination against different type of workers
  – Technology growth
  – Insufficient fiscal transfers from rich to poor

• **An alternative hypothesis:**
  – Market power may transfer wealth from wage earners to business owners, reinforcing further existing inequality
Sources of Inequality

• How does market power affect the distribution of income and wealth?
  – The existence of corporate market power has a dual effect
    • It generates profits for companies above the competitive rate of return
    • It raises prices on consumers, reducing their real income and their ability to save
Sources of Inequality

- Consumers’ deadweight loss
- Producers’ deadweight loss
- Redistribution effect from consumers to producers
• Previous literature has found a positive link between market power and inequality…

  – Theoretical Background:

  – Quantification of the impact on wealth distribution:
    • Comanor and Smiley (1975)
    • Ennis and Kim (2015)

    methodology has not been updated since then!
On the other hand, Piketty counter argues that:

- “The fundamental force of divergence (...) can be summed up in the inequality $r > g$, which has nothing to do with market imperfections and will not disappear as markets become freer and more competitive.”
According to Piketty’s theory, as long as $r > g$, wealth inequality will be increasingly amplified over time, regardless of authorities efforts to tackle market power.

Main Criticisms to Piketty’s work:
- Underlying assumption that all capital gains are reinvested and wages are entirely consumed;
- Fails to account for decreasing returns on capital;
- Criticism of the conceptual definitions of return on capital and wealth
The Model

- A new dynamic model with endogenous wealth ($W$), income ($Y$) and consumption ($C$)
1. The model captures only the effect of market power on prices, which are all inflated in an equal percentage
2. Market power is measured by aggregate mark-ups
3. Wealth, income and consumption shares are constant in steady-state
4. Marginal propensities to save are constant across wealth groups
Model – Variables & Parameters

• **Variables**
  – F = Wealth
  – Y = Income
  – C = Consumption
  – W = Wages
  – R = Return on capital

• **Parameters**
  – \( \mu \) = mark-up (price over marginal cost)
  – \( s' \) = marginal propensity to save
  – \( \bar{s} \) = average saving rate
  – \( \alpha_L \) = share of labour income

Subscripts \( m \) and \( c \) are used for the monopolistic and competitive steady states, respectively.

Lower case letters refer to shares.
The steady-state levels of wealth, income and consumption are driven by the following equations:

- **National Income Identity**
  \[ Y = W + R \]

- **Consumption Function**
  \[ C = \bar{C} + (1 - s')Y \]

- **Wealth Dynamics**
  \[ F_{t+1} = F_t + Y_t - C_t \]

\[ F^*, Y^*, C^* \]
National Income Identity

• Aggregate output equals the sum of labour and capital income:

\[ Y = W + R \]

• Comparing the two steady states, at the group level:

\[ y_{i}^{m} - y_{i}^{c} = (\mu - 1)(f_{i}^{m} - y_{i}^{m}) + (1 - \mu \alpha_{L})(f_{i}^{m} - f_{i}^{c}) \]
National Income Identity - illustration

• Suppose that population group $i$ does not hold wealth in any of the steady-states:

$$f_i^m = f_i^c = 0$$

• Then:

$$y_i^m - y_i^c = -(\mu - 1)y_i^m \leftrightarrow y_i^c = \mu y_i^m$$

A 1.1 mark-up ($\mu=1.1$) implies that the income of group $i$ is 10% higher under competition
Consumption Function

• Linear consumption function with independent term and constant marginal propensity to save

\[ C = \bar{C} + (1 - s')Y \]

• Comparing the two steady states, at the group level:

\[ c_i^m - c_i^c = \frac{1 - s'}{1 - \bar{s}} (y_i^m - y_i^c) \]
Wealth Dynamics

- The dynamics of wealth are described by the following difference equation:

\[ F_{t+1} = F_t + Y_t - C_t \]

- In equilibrium:

\[ F_{t+1} = F_t (1 + g) \iff F = \frac{Y - C}{g} \]

- Comparing the two steady states, at the group level:

\[ f_i^m - f_i^c = \frac{1}{\bar{s}} (\gamma_i^m - \gamma_i^c) - \frac{1 - \bar{s}}{\bar{s}} (c_i^m - c_i^c) \]
Solution of the Model

- **Redistributive effect of market power on wealth:**

\[
 f_i^c = f_i^m + k_w (y_i^m - f_i^m), \quad k_w = \frac{s'(\mu - 1)}{1 - \frac{s'}{\bar{s}} (1 - \mu \alpha_L)}
\]

- \( f_i^c \) - wealth share of group \( i \) under competition
- \( f_i^m \) - wealth share of group \( i \) under market power
- \( y_i^c \) - income share of group \( i \) under competition
- \( y_i^m \) - income share of group \( i \) under market power
- \( \mu \) - mark-up
- \( s' \) - marginal propensity to save
- \( \bar{s} \) - average saving rate
- \( \alpha_L \) - share of labour income
Solution of the Model

Redistributive effect of market power on income:

\[ y_i^c = y_i^m + k_i(y_i^m - f_i^m), \quad k_i = \frac{\mu - 1}{1 - \frac{s'}{\bar{s}}(1 - \mu \alpha_L)} \]

- \( f_i^c \) - wealth share of group \( i \) under competition
- \( f_i^m \) - wealth share of group \( i \) under market power
- \( y_i^c \) - income share of group \( i \) under competition
- \( y_i^m \) - income share of group \( i \) under market power
- \( \mu \) - mark-up
- \( s' \) - marginal propensity to save
- \( \bar{s} \) - average saving rate
- \( \alpha_L \) - share of labour income
Solution of the Model

• Redistributive Effect of Market Power for $s' = \bar{s}$:

$$f^c_i = f^m_i + \frac{\mathcal{L}}{\alpha_L} (y^m_i - f^m_i), \quad \mathcal{L} = \text{Lerner Index}$$
Interpretation of the model

- **Redistributive Effect of Market Power for** $s' = \bar{s}$:

\[
f^c_i = f^m_i + \frac{\mathcal{L}}{\alpha_L} (y^m_i - f^m_i), \quad \mathcal{L} = \text{Lerner Index}
\]

- **Direction of the effect:**
  - *IF* $y^m_i > f^m_i$, competition *raises* the wealth share of the household
  - *IF* $y^m_i < f^m_i$, competition *drops* the wealth share of the household
Interpretation of the model

• Redistributive Effect of Market Power for \( s' = \bar{s} \):

\[
f_i^c = f_i^m + \frac{\mathcal{L}}{\alpha_L} (y_i^m - f_i^m), \quad \mathcal{L} = \text{Lerner Index}
\]

• Dimension of the effect:
  – The greater the Lerner Index (indicator of market power), the greater the absolute size of the effect
  – The greater the income share of labour, the smaller the absolute size of the effect
Calibrating the model

• The model was calibrated for **8 countries** representative of more than half of the wealth in the world:
  – Canada, France, Germany, Japan, South Korea, Spain, United Kingdom, United States.

• **Data required:**
  – Wealth and income distributions
  – Indicator of market power
  – Income share of labour
  – Marginal and average propensities to save
Wealth and Income Distributions

• **Databases:**
  – OECD wealth distribution database 2012
  – OECD income distribution database 2014
  – Household surveys by National Statistic Offices (most recent years available)

• **Breakdown by 8 population groups:**

<table>
<thead>
<tr>
<th>Population Group</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom 20%</td>
<td>20% - 40%</td>
</tr>
<tr>
<td>20% - 40%</td>
<td>40% - 60%</td>
</tr>
<tr>
<td>40% - 60%</td>
<td>60% - 80%</td>
</tr>
<tr>
<td>60% - 80%</td>
<td>80% - 90%</td>
</tr>
<tr>
<td>80% - 90%</td>
<td>91% - 95%</td>
</tr>
<tr>
<td>91% - 95%</td>
<td>96% - 99%</td>
</tr>
<tr>
<td>96% - 99%</td>
<td>Top 1%</td>
</tr>
</tbody>
</table>
Market Power Indicator

- Mark-up data estimated by Høj et al. (2007) for the period 1975-2002, using the OECD-STAN Database.

Market Power Indicator

Sources of Market Power

Legitimate Sources

- Product differentiation
- Brands
- Intellectual Property Rights
  - Patents
  - Trademarks
  - Copyrights

Illegitimate Sources

- Cartels
- Exclusionary conducts
- Anti-competitive mergers
- Anti-competitive market regulations
- …
Market Power Indicator

- **Estimation of excess mark-ups**
  - Comparison of sector level mark-ups with the minimum mark-up observed across countries

![Mark-ups across countries](image)

- Competitive mark-up
- Excess mark-up

<table>
<thead>
<tr>
<th>Country</th>
<th>Competitive mark-up</th>
<th>Excess mark-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>France</td>
<td>15%</td>
<td>10%</td>
</tr>
<tr>
<td>Germany</td>
<td>20%</td>
<td>15%</td>
</tr>
<tr>
<td>Japan</td>
<td>12%</td>
<td>8%</td>
</tr>
<tr>
<td>Korea</td>
<td>25%</td>
<td>20%</td>
</tr>
<tr>
<td>Spain</td>
<td>18%</td>
<td>13%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>15%</td>
<td>10%</td>
</tr>
<tr>
<td>United States</td>
<td>20%</td>
<td>15%</td>
</tr>
</tbody>
</table>
Income Share of Labour


Savings Data

- **Marginal Propensity to Save (MPS)**
  - Review of 11 empirical papers that estimate the MPS out of a permanent shock in income: \( 0.11 < s' < 0.23 \)

- **Average Saving Rate**
  - Data collected by national statistical offices of the eight countries for the last 50 years:

![saving_rates_graph.png](attachment://saving_rates_graph.png)
Results

Marginal effect of market power (Δμ = 1%)

Total effect of “excessive” market power
Impact from a 1% mark-up reduction

Average for 8 OECD countries

%  %

Top 1 99 - 96 95 - 91 90 - 81 80 - 61 60 - 41 40 - 21 Bottom 20

Wealth shares

Income shares

Canada  Germany  Korea  United Kingdom
France  Japan  Spain  United States
Main Findings

• **Who wins and who looses**
  – In general, a marginal reduction of market power generates a transfer of income and wealth from the Top 10% to the Bottom 90%

• **A squeezed middle**
  – The households more harmed by market power are not always the very poor, but those with a reasonable income level (that falls in real terms due to higher prices) and a low share of total wealth

• **Relative impact of market power**
  – Proportionally to the current income and wealth levels, the poorest households are the most affected by market power
Results

Marginal effect of market power \((\Delta \mu = 1\%)\)

Total effect of “excessive” market power
Impact from eliminating excessive market power

![Bar chart showing average wealth shares for 8 OECD countries]
Comparative Results

- Impact on the Top 10% richest from eliminating “excessive” market power:

![Rate of change in wealth of the Top 10%](chart.png)
Main Findings

• **Significant impact of market power on inequality**
  – On an average country, excessive market power accounts for between 6% and 21% of the wealth of the top decile

• **Sensitivity of results to saving behaviour**
  – The impact of market power on wealth crucially depends on the ability of households to save additional portions of income

• **Implications for the effects of competition policy**
  – An effects-based competition policy can prevent illegitimate market power from redistributing income and wealth towards the richest and most powerful, thus contributing to less inequality
Main Findings

Money value for pro-competitive policies

- Policies designed to eliminate “excessive” market power in the 8 OECD countries studied could lead to a transfer of wealth from the Top 10% richest to the Bottom 90% poorest amounting to 4.5 to 16 trillion USD PPP

<table>
<thead>
<tr>
<th>Country</th>
<th>$s' = \bar{s}$</th>
<th>$s' = 1.5 \bar{s}$</th>
<th>$s' = 2 \bar{s}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>119.8</td>
<td>234.0</td>
<td>447.4</td>
</tr>
<tr>
<td>France</td>
<td>274.3</td>
<td>512.8</td>
<td>907.3</td>
</tr>
<tr>
<td>Germany</td>
<td>603.0</td>
<td>1152.5</td>
<td>2117.3</td>
</tr>
<tr>
<td>Japan</td>
<td>439.2</td>
<td>861.4</td>
<td>1658.6</td>
</tr>
<tr>
<td>Korea</td>
<td>195.2</td>
<td>364.6</td>
<td>644.0</td>
</tr>
<tr>
<td>Spain</td>
<td>211.5</td>
<td>411.4</td>
<td>780.0</td>
</tr>
<tr>
<td>UK</td>
<td>112.9</td>
<td>209.1</td>
<td>363.9</td>
</tr>
<tr>
<td>USA</td>
<td>2526.2</td>
<td>4883.9</td>
<td>9156.8</td>
</tr>
<tr>
<td>SUM</td>
<td>4482.1</td>
<td>8629.6</td>
<td>16075.2</td>
</tr>
</tbody>
</table>
Future Work…

• Measure the redistributive effect or market power in less developed countries

• Account for possible impacts of market power on wages of managers and high-level employees

• Extend the model to different MPS across groups

• Estimate mark-ups using more recent data
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THANK YOU

Any comments and suggestions are welcome, please send them to:
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Impact from a 1% mark-up reduction

Wealth shares

Income shares

← Go back
Impact from a 1% mark-up reduction

Wealth shares

Income shares
Impact from a 1% mark-up reduction

Wealth shares

Income shares

← Go back
Impact from a 1% mark-up reduction

Japan

- Wealth shares
- Income shares

Go back
Impact from a 1% mark-up reduction

Korea

% Weights shares

Income shares

Korea

% Weights shares

Income shares

Go back
Impact from a 1% mark-up reduction

Spain

Wealth shares

Income shares
Impact from a 1% mark-up reduction

United Kingdom

- Wealth shares
- Income shares

Go back
Impact from a 1% mark-up reduction

United States

%

Wealth shares

Income shares

Go back
Impact from eliminating excessive market power

Canada

- Current wealth shares
- Shares absent market power

Bar chart showing the distribution of wealth in Canada across different percentile categories.
Impact from eliminating excessive market power
Impact from eliminating excessive market power

![Graph showing the impact of eliminating excessive market power in Germany. The graph compares current wealth shares (blue bars) and shares absent market power (gray bars) across different years. The graph indicates a significant increase in wealth shares among the bottom 80% compared to other groups.](image)
Impact from eliminating excessive market power

Japan

- Current wealth shares
- Shares absent market power

%
Impact from eliminating excessive market power

Korea

- Current wealth shares
- Shares absent market power

Top 1: 10%
99-96: 15%
96-91: 12%
90-81: 18%
Bottom 80: 40%
Impact from eliminating excessive market power

![Bar chart showing the impact of eliminating excessive market power in Spain. The chart compares current wealth shares with shares absent market power across different periods: Top 1, 99-96, 96-91, 90-81, and Bottom 80. The chart indicates a significant increase in wealth shares when market power is eliminated.]
Impact from eliminating excessive market power

United Kingdom

Current wealth shares
Shares absent market power

Top 1
99 - 96
96 - 91
90 - 81
Bottom 80

%
Impact from eliminating excessive market power

United States

- Current wealth shares
- Shares absent market power

Percent (%)

Top 1  99-96  96-91  90-81  Bottom 80
Comparative results

- **Impact of market power in the 10% wealthiest households**

<table>
<thead>
<tr>
<th>Country</th>
<th>Rate of change in wealth ((\cdot))</th>
<th>Real value of change in wealth (billions USD PPP)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(s' = \bar{s})</td>
<td>(s' = 1.5 \bar{s})</td>
</tr>
<tr>
<td>Canada</td>
<td>4.4</td>
<td>8.5</td>
</tr>
<tr>
<td>France</td>
<td>6.8</td>
<td>12.7</td>
</tr>
<tr>
<td>Germany</td>
<td>10.0</td>
<td>19.2</td>
</tr>
<tr>
<td>Japan</td>
<td>4.7</td>
<td>9.3</td>
</tr>
<tr>
<td>Korea</td>
<td>7.9</td>
<td>14.7</td>
</tr>
<tr>
<td>Spain</td>
<td>6.5</td>
<td>12.6</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2.6</td>
<td>4.8</td>
</tr>
<tr>
<td>United States</td>
<td>5.3</td>
<td>10.2</td>
</tr>
<tr>
<td>Average</td>
<td>6.0</td>
<td>11.5</td>
</tr>
</tbody>
</table>