<table>
<thead>
<tr>
<th>Author</th>
<th>Book</th>
<th>Pigouvian Tools</th>
<th>Negative Externalities</th>
<th>Pigouvian Reasoning</th>
<th>Policy Proposals</th>
<th>Explicit Pigou References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bach, George Leland</td>
<td>Economics. An Introduction to Analysis and Policy (1954, 1963)</td>
<td>Social vs. private costs, hidden costs, socially justifiable output, ideal resource allocation</td>
<td>Industrial smoke and dirt</td>
<td>MSC&gt;MPC→ raises interesting issues as to government intervention</td>
<td></td>
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<tr>
<td>McConnell, Campbell R.</td>
<td>Elementary Economics: Principles, Problems and Policies (1960, 1966, 1969)</td>
<td>Social vs. private costs, misallocation of resources, optimal output</td>
<td>Air (smoke and dust) and water pollution, increased risk of explosions</td>
<td>MSC&gt;MPC → justifiable penalties (guilty polluters)</td>
<td>Plausible policies: prohibition, taxes, and subsidies; all subject to Pigouvian qualifications</td>
<td></td>
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<tr>
<td>Abbott, Lawrence</td>
<td>Economics and the Modern World (1960, 1967)</td>
<td>Social vs. Private Costs, misallocation of resources</td>
<td>Factory smoke and Soot</td>
<td>MSC&gt;MPC→ The government should intervene</td>
<td>Smoke tax, unspecified other methods</td>
<td></td>
</tr>
<tr>
<td>Authors</td>
<td>Title</td>
<td>Social vs. Private Costs</td>
<td>Externality</td>
<td>Marginal Social Cost vs. Marginal Private Cost</td>
<td>Government Action</td>
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<td>Alchian, Armen A. and Allen, William R.</td>
<td><em>University Economics</em> (1964)</td>
<td>Social vs. private costs, externality</td>
<td>Factory smoke, ashes, soot, airborne acids, smog</td>
<td>MSC&gt;MPC→ no definitive conclusion</td>
<td>Government action may inflict more harm than good.</td>
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<tr>
<td>Ferguson, Charles and Krep, Juanita</td>
<td><em>Principles of Economics</em> (1965)</td>
<td>Marginal social vs. private costs, external diseconomies, maximum social welfare</td>
<td>Industrial oil or coal smoke, smog</td>
<td>MSC&gt;MPC→ no conclusion regarding policy</td>
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<tr>
<td>Lipsey, Richard C. and Steiner, Peter O.</td>
<td><em>Economics</em> (1966)</td>
<td>Social vs. private costs, resource misallocation</td>
<td>Smog, water pollution</td>
<td>If MSC&gt;MPC→ government intervention (if discrepancy large)</td>
<td>State regulation, operation, ownership, or control</td>
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<tr>
<td>Reynolds, Lloyd</td>
<td><em>Economics: A General Introduction</em> (1966)</td>
<td>Social vs. private costs, efficient resource allocation</td>
<td>Air and water pollution, traffic congestion</td>
<td>MSC≠MPC→ can often be resolved by government action</td>
<td>Compulsory education, health regulation, tolls and parking costs equal to externality</td>
<td></td>
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</tbody>
</table>

* Parenthetical dates in column two refer to the dates of textbook editions.*
<table>
<thead>
<tr>
<th>Author</th>
<th>Book</th>
<th>Pigouvian Tools</th>
<th>Negative Externality</th>
<th>Pigouvian Reasoning</th>
<th>Policy Proposals</th>
<th>Explicit Pigou References</th>
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<tbody>
<tr>
<td>Krutilla, John V. and Eckstein, Otto</td>
<td><em>Multiple Purpose River Development</em> (1958)</td>
<td>Marginal private and social product, social marginal productivity, negative externalities, inefficient resource allocation</td>
<td>Smoke and gas emissions, water pollution</td>
<td>MPP&gt;MSP→ opportunity to equalize the two</td>
<td>Non-market devices through collective action; mindful of the social cost of public funds</td>
<td></td>
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<tr>
<td>Kneese, Allen V.</td>
<td><em>The Economics of Regional Water Quality Management</em> (1964)</td>
<td>External (technological) diseconomies, private vs. social costs, inefficient resource allocation</td>
<td>Water pollution, smoke nuisance, aesthetic pollution</td>
<td>SC&gt;PC→ Alternative public interventions in important cases</td>
<td>Coasean solutions (limited usefulness), effluent charges, subsidies, quality standards (assuming the cost of public intervention &lt; its benefit); predisposition toward a system of charges</td>
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<tr>
<td>Jarett, Henry (ed.) [Kenneth Boulding; Ralph Turvey]</td>
<td><em>Environmental Quality in a Growing Economy</em> (1966)</td>
<td>External diseconomies; economic welfare; price system failure (Boulding); market failure; social vs. private costs; external diseconomy; efficient resource allocation (Turvey)</td>
<td>Atmospheric pollution; pollution of lakes and oceans (Boulding); overfishing; traffic congestion; noise, water, and air pollution (Turvey)</td>
<td>Market failure→ “need” for special legislation (Boulding); additional mechanisms “may” be used to improve resource allocation (Turvey)</td>
<td>Tort law (ineffective for widespread social damages affecting each individual by a small amount), special corrective tax legislation. mindful of equity considerations (Boulding); regulation, contractual arrangements, legal action, per unit/time nuisance taxes; policy choice dependent on case-by-case analyses of merits, mindful of equity considerations and political feasibility (Turvey)</td>
<td></td>
</tr>
<tr>
<td>Author(s)</td>
<td>Title</td>
<td>External Diseconomies, Misallocation of Resources, Market Failure</td>
<td>Environmental Damage</td>
<td>Externalities Call for Flexibility in the Choice of Remedies</td>
<td>Regulation, Subsidies, Charges/Fees/Taxes (Strong Presumption in Favor of the Latter)</td>
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<td>Freeman, A. Murck III; Haverman, Robert H.; and Kneese, Allen V.</td>
<td><em>The Economics of Environmental Policy</em> (1973)</td>
<td>Water pollution, smog, soot, congestion</td>
<td>Water pollution, smog, soot, soot, congestion</td>
<td>When MSC&gt;MPC→ alternative ways of addressing externalities</td>
<td>Coasean solutions, standards, regulation, smog tax, per pound sulfur tax a la Rand Corporation</td>
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<tr>
<td>Baumol, William J. and Oates, Wallace E.</td>
<td><em>Economics, Environmental Policy, and the Quality of Life</em> (1979)</td>
<td>Air pollution (a variety of GHGs, fumes, smog), noxious water pollutants</td>
<td>Incidental injuries, externality, market failure, private and social costs</td>
<td></td>
<td>Moral suasion, direct controls, market solutions (taxes, subsidies, auctioned permits, refunds, property rights assignment). Policy choice to be determined on a case-by-case basis. Mindful of measurement, distributive, administrative, political, and public awareness dimensions.</td>
<td></td>
</tr>
<tr>
<td>Author</td>
<td>Book</td>
<td>Pigouvian Tools</td>
<td>Negative Externalities</td>
<td>Pigouvian Reasoning</td>
<td>Policy Proposals</td>
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<td>Thompson, Wilbur</td>
<td><em>A Preface to Urban Economics</em> (1965)</td>
<td>Private vs. social costs, external diseconomies</td>
<td>Traffic congestion due to cars, dirt, noise, odors, delays</td>
<td>SC&gt;PC→ estimate these costs</td>
<td>Enlarge the local government to do social cost pricing by assigning user charges roughly equal to the externality</td>
<td></td>
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<tr>
<td>Perloff, Harvey S. and Wingo, Lowdon Jr. (eds) [Alan Campbell and Jesse Burkhead]</td>
<td><em>Issues in Urban Economics</em> (1968)</td>
<td>Private vs. social costs, externalities (Campbell and Burkhead)</td>
<td>Congestion, accidents, and air pollution due to automobiles (Campbell and Burkhead)</td>
<td>SC&gt;PC→ externalities need to be addressed.</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Netzer, Dick</td>
<td><em>Economics and Urban Problems. Diagnoses and Prescriptions</em> (1970)</td>
<td>External costs, market failure</td>
<td>Air pollution due to cars, water pollution, noise, congestion</td>
<td>SC&gt;PC→ local, state, and federal government must try to internalize important externalities</td>
<td>Prohibition, Regulation, standards, subsidies, charges on waste</td>
<td></td>
</tr>
<tr>
<td>Richardson, Harry W.</td>
<td><em>Urban Economics</em> (1971)</td>
<td>Externalities, diseconomies, misallocation of resources, (marginal) private and social costs</td>
<td>Water pollution, congestion (noise, lost time, accidents, discomfort to residents and pedestrians, air pollution)</td>
<td>MSC→ a variety of policy alternatives</td>
<td>Do nothing (politically unacceptable), prohibition, road (shadow) pricing equal to MSC (the case for this is very strong); measurement problems</td>
<td></td>
</tr>
<tr>
<td>Author</td>
<td>Title</td>
<td>External effects, misallocation of resources, Long run marginal cost (inclusive of external costs), social costs</td>
<td>Air, water, and solid waste pollution;</td>
<td>LRM(S)C&gt;P → Policy subject to the proviso that MB of abatement&gt; MC of abatement</td>
<td>Regulation, legal proceedings (poor solution); material disposal tax (on all types of discharge); congestion tax</td>
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<td>Mills, Edwin S.</td>
<td><em>Urban Economics</em> (1972)</td>
<td>External diseconomies, misallocation of resources, Long run marginal cost (inclusive of external costs), social costs</td>
<td>Air, water, and solid waste pollution;</td>
<td>LRM(S)C&gt;P → Policy subject to the proviso that MB of abatement&gt; MC of abatement</td>
<td>Regulation, legal proceedings (poor solution); material disposal tax (on all types of discharge); congestion tax</td>
<td></td>
</tr>
<tr>
<td>Hirsch, Werner Z.</td>
<td><em>Urban Economic Analysis</em> (1973)</td>
<td>External effects, social and private net products, allocative efficiency</td>
<td>Congestion, pollution (air, water, noise), smog, economic instability</td>
<td>MSC&gt;MPC→ often justify government action</td>
<td>State ownership, regulation (standards), taxes (polluter’s fees), subsidies, zoning; measurement of social costs necessary for determining charges.</td>
<td>✓</td>
</tr>
<tr>
<td>Button, K.J.</td>
<td><em>Urban Economics: Theory and Policy</em> (1976)</td>
<td>Negative externalities, optimal allocation of resources, marginal private and social costs</td>
<td>Air pollution due to transportation (noise, vibration, dirt, loss of sunlight, accidents, and congestion)</td>
<td>MSC&gt;MPC→ policy can create a shadow price for externalities</td>
<td>Standards, taxes (more efficient than subsidies); mindful of distributive, administrative, and measurement problems.</td>
<td>✓</td>
</tr>
<tr>
<td>Author</td>
<td>Book</td>
<td>Pigouvian Tools</td>
<td>Negative Externalities</td>
<td>Pigouvian Reasoning</td>
<td>Policy Proposals</td>
<td>Explicit Pigou References</td>
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<tr>
<td>Musgrave, Richard A.</td>
<td><em>The Theory of Public Finance. A Study in Public Economy</em> (1959)</td>
<td>Private and social products, social costs, optimal (efficient) allocation of resources, market failure, external diseconomies;</td>
<td>Factory air pollution, smoke nuisance</td>
<td>MSNP≠MNP→ corrective action may be desirable and feasible in some cases; alternative techniques are possible</td>
<td>Controls, tax-subsidy schemes; the choice of technique determined by economic, political, social, and cultural variables.</td>
<td>✓</td>
</tr>
<tr>
<td>Buchanan, James M.</td>
<td><em>The Public Finances: An Introductory Textbook</em> (1960, 1965)</td>
<td>Social cost, inefficient allocation of road services</td>
<td>Traffic congestion</td>
<td>State action for solving congestion</td>
<td>Variable user taxes as prices (simplest, most consistent with freedom of choice), controls, license/registration fees</td>
<td></td>
</tr>
<tr>
<td>Due, John F.</td>
<td><em>Government Finance. An Economic Analysis</em> (1963, 1968)</td>
<td>Marginal social and private costs, external diseconomies, economic welfare, optimum resource allocation</td>
<td>Liquor consumption, air and water pollution, increasing cost industries</td>
<td>MSC&gt; MPC→ government intervention may be used</td>
<td>Per unit tax may be effective, prohibition, regulation, public production</td>
<td>✓</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Book Title</td>
<td>Market Failure, External Diseconomies, Social vs. Private Costs, Optimal Market Results</td>
<td>Water Pollution</td>
<td>Social Cost ≠ Private Cost → If the discrepancy large enough, it may fall in government territory</td>
<td>Regulation or Taxes</td>
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<tr>
<td>Eckstein, Otto</td>
<td><em>Public Finance</em> (1964, 1973)</td>
<td>Market failure, external diseconomies, social vs. private costs, optimal market results</td>
<td>Water pollution</td>
<td>Social Cost ≠ Private Cost → If the discrepancy large enough, it may fall in government territory</td>
<td>Yes</td>
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<tr>
<td>Herber, Bernard P.</td>
<td><em>Modern Public Finance</em> (1967)</td>
<td>External diseconomies, externalities, social vs. private costs, optimal allocation of resources</td>
<td>Air pollution, traffic congestion</td>
<td>Social Cost &gt; Private Cost → Governments must play a role to achieve optimal allocation</td>
<td>Yes</td>
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<tr>
<td>Musgrave Richard A. and Musgrave, Peggy B.</td>
<td><em>Public Finance in Theory and Practice</em> (1973)</td>
<td>External costs, social vs. private costs, inefficient resource allocation, optimal output</td>
<td>Air pollution (factory smoke and odor, automobile and household pollution), water pollution, traffic congestion</td>
<td>Marginal Social Cost &gt; Marginal Private Cost → Policy warranted if the number of parties large</td>
<td>Coasean solutions (unworkable with large number of victims), per unit tax, subsidies; mindful of measurement and administrative problems</td>
<td>Yes</td>
</tr>
</tbody>
</table>

* Parenthetical dates in column two refer to the dates of textbook editions.
## Table 5—Authors’ Degrees and Institutions

<table>
<thead>
<tr>
<th>Author</th>
<th>Undergraduate Degree Institution (Year)</th>
<th>Master’s Degree Institution (Year)</th>
<th>Ph.D. Degree Institution (Year)</th>
</tr>
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<tbody>
<tr>
<td>Abbott, Lawrence</td>
<td>Harvard University (1924)</td>
<td>Columbia University (1945)</td>
<td>Columbia University (1951)</td>
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<td>Alchian, Armen A.</td>
<td>Stanford University (1936)</td>
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<td>Stanford University (1943)</td>
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<tr>
<td>Bach, George Leland</td>
<td>Cornell University (1936)</td>
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<td>University of Chicago (1940)</td>
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<tr>
<td>Baumol, William J.</td>
<td>City University of New York (1942)</td>
<td>Graduate work at the University of Wisconsin</td>
<td>London School of Economics (1949)</td>
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<tr>
<td>Boulding, Kenneth</td>
<td>Oxford University (1931)</td>
<td>Postgraduate work at Chicago and Harvard (1930s)</td>
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<tr>
<td>Bower, Blair T.</td>
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<tr>
<td>Buchanan, James M.</td>
<td>Middle Tennessee State Teachers College (1940)</td>
<td>University of Tennessee (1941)</td>
<td>University of Chicago (1948)</td>
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<td>Burkhead, Jesse</td>
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<tr>
<td>Campbell, Alan K.</td>
<td>Whitman College (1947)</td>
<td>Wayne University (1949)</td>
<td>Harvard University (1952)</td>
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<tr>
<td>Due, John F.</td>
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<td>Harvard University (1950)</td>
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<tr>
<td>Herber, Bernard P.</td>
<td>Loyola Marymount University-Los Angeles (1954)</td>
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<td>University of Washington (1960)</td>
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<td>Name</td>
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<tr>
<td>Ferguson, Charles</td>
<td>Hendrix College (1949) University of North Carolina (1951) University of North Carolina (1957)</td>
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<tr>
<td>Freeman, Myrick A. III</td>
<td>Cornell University (1957) University of Washington (1964) University of Washington (1965)</td>
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<td>Haverman, Robert H.</td>
<td>Calvin College (NA) Vanderbilt University (1963)</td>
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<tr>
<td>Hirsch, Werner Z.</td>
<td>Hebrew University of Jerusalem and University of California—Berkeley (1947) University of California—Berkeley (1949)</td>
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<td>Jarrett, Henry</td>
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<td>Kneese, Allen V.</td>
<td>South West Texas State College University of Colorado (1953) Indiana University (1956)</td>
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<tr>
<td>Krutilla, John V.</td>
<td>Reed College (1949) Harvard University (1951) Harvard University (1952)</td>
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<tr>
<td>Lipsey, Richard</td>
<td>University of British Columbia University of Toronto (1953) London School of Economics (1956)</td>
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<tr>
<td>McConnell, Campbell R.</td>
<td>Cornell College (1950) University of Illinois (1951) University of Iowa (1953)</td>
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<td>Mills, Edwin</td>
<td>Brown University (1951) University of Birmingham (1956)</td>
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<td>Musgrave, Richard A.</td>
<td>Heidelberg University (1933) Harvard University (1936) Harvard University (1937)</td>
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<td>Netzer, Richard</td>
<td>University of Wisconsin (1946) Harvard University (1948) Harvard University (1952)</td>
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<td>Perloff, Harvey S.</td>
<td>University of Pennsylvania (1933?)</td>
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<td>Harvard University (1940)</td>
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<td>Reynolds, Lloyd</td>
<td>University of Alberta (1931)</td>
<td>McGill University (1933)</td>
<td>Harvard University (1936)</td>
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<td>Richardson, Harry W.**</td>
<td>Manchester University (1959)</td>
<td>Manchester University (1961)</td>
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<td>Samuelson, Paul A.</td>
<td>University of Chicago (1935)</td>
<td>Harvard University (1936)</td>
<td>Harvard University (1941)</td>
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<td>Steiner, Peter O.</td>
<td>Oberlin College (1943)</td>
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<td>Thompson, Wilbur R.</td>
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<tr>
<td>Turvey, Ralph</td>
<td>London School of Economics (1947)</td>
<td>Uppsala University (Post-Graduate work 1947-48)</td>
<td>London School of Economics (DSc, 1971)</td>
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<td>Wingo, Lowdon Jr.</td>
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<td>Wolzin, Harold</td>
<td>Tufts (1942)</td>
<td></td>
<td>Columbia University (1955)</td>
</tr>
</tbody>
</table>

*Parenthetical dates refer to years of graduation (or in some cases, study).

** We are grateful to Emeritus Professor James E. Moore, II, at the University of Southern California for information on Richardson.