

Pecuniary externalities create third-party effects through changes in relative prices or asset prices. Unlike technological externalities, they do not misallocate resources and are necessary for the market to work efficiently. However, the political process does not differentiate pecuniary from technological externalities and often tries to prevent pecuniary externalities, which creates resource misallocations. The article shows how pecuniary externalities function in markets, why the political process takes account of pecuniary externalities, and why public policy toward pecuniary externalities results in resource misallocations.

PUBLIC POLICY TOWARD PECUNIARY EXTERNALITIES

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Pecuniary externalities have been analyzed relatively little by economists, perhaps because the costs or benefits they create do not result in resource misallocations. In a market system, the activities of some people often change relative prices or affect the value of assets, which create benefits for or impose costs on third parties. Because these effects are merely pecuniary and do not imply economic inefficiencies, they are often dismissed without further analysis. In the competitive model, resources are allocated efficiently when individuals have clear property rights over the ownership of all resources but not over the value of the resources they own.¹ Because individuals do not have property rights to the present value of their assets in a competitive private market, pecuniary gains and losses do not require compensation by the inflicting party.² Individuals who are made better or worse off because of pecuniary externalities have no ability to interfere in the decisions of the others who will impose these gains or losses. In addi-

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tion, individuals are not required to incorporate into their decision-making calculus the value of pecuniary gains or losses they impose on others. In fact, the ability of new firms to enter an industry and inflict pecuniary losses on existing firms is the process that generates efficiency in competitive markets. The ability of some individuals to inflict pecuniary losses on others is *necessary* for economic efficiency.

Government action inherently differs from market action because it allows individuals the possibility of claiming pecuniary gains and of protecting themselves from pecuniary losses through the political process. Private insurance markets can offer a more efficient way than government intervention to guard against pecuniary externalities, but private insurance only pushes the problem back one step, because insurance companies then have the incentive to enter the political process to protect themselves from pecuniary losses. The widespread prevalence of rent seeking, which is the expenditure of resources to capture or prevent these pecuniary changes, is a testament to their magnitude and frequency of occurrence in the economy. If political decisions required unanimous approval, people would have to compensate each other for the pecuniary externalities associated with government policies. Votes on free trade agreements such as the North American Free Trade Agreement (NAFTA), for example, would require that the pecuniary winners from free trade compensate the pecuniary losers.³ If market entry decisions were subject to collective approval, a Burger King wishing to open up next door to a McDonalds would have to compensate the owners of McDonalds for the pecuniary losses inflicted (the present value of McDonalds' reduced profits).

For efficiency, people must take account of the technological externalities that they create, but pecuniary externalities should be ignored. Yet in many cases, public policy takes into account the effects of pecuniary externalities, and resources are allocated less efficiently as a result. Protective tariffs to help mitigate the effects of foreign competitors on domestic firms, and unemployment compensation to help mitigate the impact on former workers from the loss of their jobs, are but two examples. In effect, the political process takes into account both pecuniary and technological externalities and treats them identically. Before analyzing in more detail public policy toward pecuniary externalities, the article will discuss the distinction between pecuniary

and technological externalities and show how taking pecuniary externalities into account creates economic inefficiencies.

PECUNIARY VERSUS TECHNOLOGICAL EXTERNALITIES

The terminology that distinguishes technological from pecuniary externalities was first used by Scitovsky (1954), who defined technological externalities as existing when the production function of one firm is affected by the production of another firm. If firm i produces output q_i using inputs $(x_i, y_i \dots)$, Firm 1 has a production function

$$q_1 = f(x_1, y_1, \dots; q_2, x_2, y_2, \dots). \quad (1)$$

If any of the terms to the right of the semicolon have a nonzero impact on q_1 , then a technological externality exists. In other words, a technological externality exists when actions taken by Firm 2 affect the physical level of output of Firm 1, holding constant Firm 1's level of input usage. It is important to hold Firm 1's level of input usage constant in the comparison, because it may be the case that the actions of Firm 2 change the price that Firm 1 must pay for its inputs, changing the input usage chosen by Firm 1 and thus Firm 1's output. This would be a pecuniary externality, not a technological one, because Firm 1 could still produce the same level of physical output with the same level of physical inputs. Of course, it would now be more costly for Firm 1 to produce the same level of output using the same level of inputs, but this is a pecuniary effect that does not affect the technological relationship between inputs and output. Because Equation 1 represents the production function and not the reduced form or optimized value of production, the terms to the right of the semicolon that have a nonzero effect on q_1 represent the direct effects on the level of production and not indirect effects occurring through changes in market prices.

Returning to Scitovsky's (1954) definition, a firm's profits, π , are also a function of its inputs and output, so Firm 1's profits can be represented as

$$\pi_1 = g(q_1, x_1, y_1, \dots; q_2, x_2, y_2, \dots). \quad (2)$$

If any of the terms to the right of the semicolon in Equation 2 have a nonzero effect on π_1 , then an externality exists, but if it is not a technological externality (because the terms to the right of the semicolon in Equation 1 have no effect on q_1), then the externality is pecuniary. Because Firm 1's profits are equal to the firm's revenues minus its costs, pecuniary externalities can occur through either revenues or costs. For example, changes in input prices directly affect Firm 1's profits through changes in its cost of production. Because the actions of Firm 2 are not directly affecting Firm 1's production function, the terms to the right of the semicolon in Equation 1 would have no effect; but because the actions of Firm 2 are directly affecting Firm 1's costs, and thus its profits, the terms to the right of the semicolon in Equation 2 would have nonzero effects on π_1 .

Pecuniary externalities may also occur because Firm 2's actions directly affect the revenues of Firm 1. For example, Firm 2 may compete with Firm 1 in the output market, driving down the price that Firm 1 can charge for its output. This would also be a pecuniary externality, but now occurring through the revenue side of the equation. Thus, changes in either the prices the firm must pay for inputs or the price it can receive for its output are pecuniary externalities, whereas technological externalities occur only when the actions of Firm 2 directly affect the amount of output Firm 1 can produce, holding constant Firm 1's usage of inputs.

The distinction between technological and pecuniary externalities predates the use of the terminology. Pigou (1924, 161) discussed externalities as being a divergence between social and private net product:

Here the essence of the matter is that one person A, in the course of rendering some service, for which payment is made, to a second person B, incidentally also renders services or disservices to other persons C, D and E, of the sort that technical considerations prevent payment being extracted from the benefited parties or compensation being enforced on behalf of the injured parties.

Pigou (p. 164) referred to these services or disservices as third-party effects.

Pigou (1924, 165-66) correctly noted that not all third-party effects lead to inefficient resource allocation:

At this point it is desirable to call attention to a somewhat specious fallacy. Some writers unaccustomed to mathematical analysis have imagined that, when improved methods of producing some commodities are introduced, the value of the marginal social net product of the resources invested in developing these methods is less than the value of the marginal private net product, because there is not included in the latter any allowance for the depreciation which the improvement causes in the value of existing plant; and, as they hold, in order to arrive at the value of the marginal social net product, such allowance ought to be included But in fact this view is not correct. The marginal social net product of resources devoted to *improved methods of producing a given commodity* is not, in general, different from the marginal private net product; for whatever loss the old producers suffer through a reduction in the price of their products is balanced by the gain which the reduction confers upon the purchasers of these products.

Although Pigou did not use modern terminology, he correctly distinguished technological from pecuniary externalities and noted that pecuniary externalities do not result in inefficiencies.

Pigou (1924) went on to consider a policy some municipalities had adopted of postponing the construction of an electric utility because the municipality already owns a gas light utility that would suffer a loss in value if people began to use electric lights, and he correctly concluded that such a postponement would reduce social welfare because the increase in the welfare of consumers would offset the loss in the capital value of the gas light utility. In modern terminology, the capital loss to the gas utility is a pecuniary externality. As is well known, Pigou suggested the application of corrective taxes and subsidies (bounties, in Pigou's terminology) in cases where third-party effects cause a divergence between private and social costs; but Pigou also clearly noted that not all third-party effects create such a divergence and that in such cases, social welfare maximization requires that such third-party effects occur. Pecuniary externalities are an integral part of the market mechanism.

Efficiency requires that people have clearly defined property rights over the ownership of property but not over the market value of that property. If individuals were granted the right to compensation for changes in the value of assets due to pecuniary externalities, all pecuniary effects would be internalized and taken into account by other individuals. Because efficiency requires individuals to take into account

technological externalities but requires that they ignore pecuniary externalities, it follows that property rights should be defined over the ownership of all goods and services in an economy to eliminate technological externalities but should not be defined over the value of goods and services. Efficiency is consistent with owners' having the right to the use of their property but not to the market value of their property.

If, to alter slightly one of Coase's (1960) examples, a confectioner were to open up for business next to a doctor's office, and the confectioner's vibrating machinery were to interfere with the doctor's use of one of her examination rooms, the vibrating machinery would cause a technological externality, which would result in an inefficient allocation of resources.⁴ If, instead of the confectioner, another doctor's office were to open up shop next to the first doctor, taking some of the first doctor's patients, the doctor would suffer a pecuniary externality from the loss of business. From the original doctor's standpoint, the cost of having the confectioner open up next door might be less than the cost of having another doctor's office there; but despite the fact that the doctor might prefer the technological externality to the pecuniary one, the technological externality implies a social cost whereas the pecuniary externality does not. Indeed, economic efficiency requires that pecuniary externalities occur as businesses compete with each other.

From a policy standpoint, efficiency requires the clear definition and protection of property rights over the ownership of resources, but efficiency also requires that no property rights be assigned over the value of those resources. In other words, for efficiency, technological externalities should be prevented but pecuniary externalities must be allowed. However, public policy often assigns people a property right to the value of their resources, thus compensating people for pecuniary externalities. For example, domestic industries claim that they deserve protection from foreign competitors, and locally owned businesses claim that they deserve protection from national chains that want to compete with them.

Should McDonalds have the right to decide whether a Burger King can open nearby, inflicting a pecuniary externality on them? Should a locally owned hardware store have the right to decide whether a Home

Depot can open nearby? In the absence of transactions costs, resources will be allocated to their highest valued uses, so it will not matter from an efficiency standpoint whether Burger King has the right to enter the market or whether McDonalds has the right and Burger King must purchase the right to enter from McDonalds. However, with reasonable assumptions about real-world transactions costs, it does matter, and property rights should be defined only over the ownership of property and not over the value of property.

PROPERTY RIGHTS AND PECUNIARY EXTERNALITIES

Just as markets do not differentiate between technological and pecuniary externalities, ignoring both, the political system also does not differentiate between them but takes equal account of both. Economic agents treat both as costs they have to bear, and from the individual agent's standpoint, whether those costs arise from technological or pecuniary externalities is irrelevant. A laundry can be harmed just as much by the opening of a competing laundry nearby as by the air pollution from a nearby factory. Similarly, a firm would lobby just as hard to prevent the loss of \$100 due to reduced profits from increased competition as it would to prevent a loss of \$100 due to increased pollution from neighboring firms. Because the political system often attempts to prevent losses due to pecuniary externalities, resources are allocated inefficiently.

To understand the potential problem, consider a simple example. A firm is earning some economic profits, as diagrammed in Figure 1. The economic efficiency losses are represented by Triangle A, and the economic profits are represented by Rectangle B. In an economy following the neoclassical competitive assumptions, the profits will encourage entry, increasing output from Q' to Q^* and resulting in the efficient allocation of resources. Should this be made consistent? The story is familiar, but here the story will be altered only slightly. Assume that the firm in Figure 1 has a property right not only to the resources it owns but also to the value of its resources. To an extent, this right may be created by giving the firm a patent that serves as a barrier to entry. Thus, the monopoly profits represented by Rectangle B are

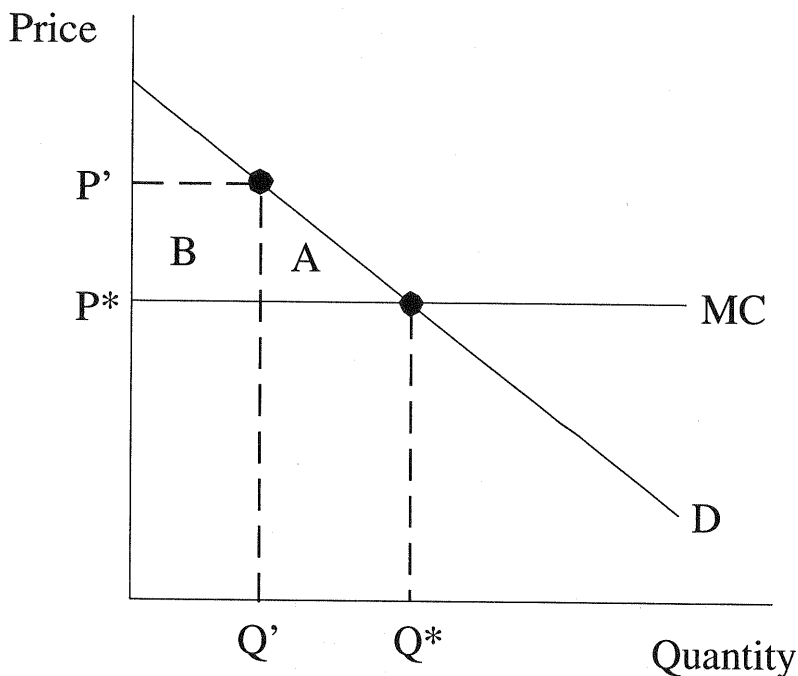


Figure 1 A Firm-Earning Economic Profit

NOTE: Q = output, P = price, MC = marginal cost.

the firm's property, and any entrants must pay the incumbent firm for its losses to be allowed to enter. Applying the Coase (1960) theorem, this will be straightforward in a competitive economy, because Rectangle B represents only a transfer and Triangle A represents a real loss of output. Thus, the gains of $A + B$ will be sufficient to pay the losses to the incumbent firm of B , allowing entry and a competitive outcome. Thus, barriers to entry such as patent rights do not impede efficiency in a world with zero transactions costs. Even in a more standard monopoly situation created by other legal barriers to entry, such as government licensing, there would be no efficiency loss in a world of zero transactions costs. Because the gain to consumers outweighs the loss to the monopolist of moving to the efficient output level, consumers would simply pay the monopolist to expand output. More generally, in

any situation in which price is greater than marginal cost, the inefficiency can be overcome in a bargain between consumers and producers.

Now change the story only slightly. Assume that firms wishing to enter must pay the incumbent for the right to enter. Also assume that, because of uncertainty about whom the customers of the firms will be, and because there are large numbers of customers who would be difficult to organize, transactions costs are high when customers will be involved and so any deal to allow entry must have the entire compensation paid by the entering firms. Customers who would benefit from entry cannot compensate the incumbent because the costs involved in organizing customers is too high. Because the entry would produce a competitive outcome, there will be no excess profits that the entrants could apply to pay the incumbent, for the loss of monopoly profits B . As the diagram is drawn, the monopoly profits are twice as large as the efficiency losses from the monopoly power, giving the incumbent monopolist a much larger incentive to retain the monopoly than anybody has to eliminate the inefficiency.

Thus, when the right to enter is given to new firms, there will be entry and an efficient outcome. When the right to control entry is given to the incumbent firm, there will still be an efficient outcome if transactions costs are low enough because the firm will sell the right to enter. But in the case where transactions costs are present, giving the right to control entry to the incumbent firm will result in a market inefficiency, because the high transactions cost prevent consumers and new firms from striking efficient bargains with the incumbent firm for the new firms to enter. When new firms must compensate existing firms for the costs they impose, this accounting for a pecuniary externality results in inefficiency.

In a political environment where those who stand to gain from converting a monopoly situation to a competitive market bid against the monopolist who wants to retain its monopoly profits, the monopolist has much more to lose than the gain produced by an increase in efficiency. The efficiency problem is solved in a world of zero transactions costs, because consumers would be able to weigh in with the transfer to them that results from lower prices. But under the assumption that consumers are unable to enter a bargain because of high transactions costs, the monopolist has more to lose than the gain in effi-

ciency from allowing entry and, more to the point, when property rights to the value of resources are created in the political marketplace, the monopolist will be able to outbid potential rivals and thus will be able to retain the monopoly.

Abstracting to the more general case of market failure, the Coase (1960) theorem suggests that technological externalities do not necessarily create market inefficiencies as long as transactions costs are low enough for individuals to bargain and internalize the externality. The above application has shown that this same logic applies to another situation traditionally viewed as market failure: the case of a monopolist protected by a barrier to entry, giving the firm a right to control market entry. Thus, just as in the case of technological externalities, the presence of a monopoly does not necessarily create a market inefficiency as long as transactions costs are low enough. Other instances generally viewed as creating market failures, such as public goods, may also be approached using the same logic. It is not the existence of externalities, monopoly, or public goods that impede market efficiency; rather, it is the presence of transactions costs in these situations that impedes the market from reaching the efficient outcome.

Returning to the more specific case of pecuniary externalities, in a world of zero transactions costs, markets would reach efficiency regardless of whether individuals did, or did not, have to compensate each other for pecuniary losses and gains. But in a world with high transactions costs associated with organizing consumers, it does matter. When compensation is required, markets will be less efficient because it will be costly to organize numerous pecuniary winners to compensate pecuniary losers. In this situation, markets will be more efficient when entering firms do not have to compensate incumbent firms for the pecuniary externalities they impose when they enter.

PECUNIARY EXTERNALITIES IN MARKETS

An understanding of the way that pecuniary externalities work in markets will help clarify their effects on public policy decisions. It also helps illuminate some efficiency problems with central planning, long-run inefficiencies that can be produced by monopoly, and other

aspects of market resource allocation. Consider Pigou's example of the city that wanted to prevent the entry of an electric utility to prevent a capital loss on its gas utility. Although the gain to the gainers would have more than offset the loss due to the pecuniary externality suffered by the gas utility, the utility owner still suffers a loss and would be better off if entry could be prevented. When firms have capital investments in specific technologies, they have a real incentive to try to prevent the entry of competing technologies that will cause pecuniary losses. Thus, in Pigou's (1924) example, even if the same firm (or the same municipality) that had the gas utility monopoly had the exclusive right to operate an electric utility, it would still have an incentive to delay the introduction of electricity to preserve the value of its gas-specific assets. If, as Pigou assumed, the introduction of electricity would create a net social gain, then if firms are profit maximizing, a second firm would be required to establish an electric utility and inflict a pecuniary externality on the gas utility. Efficiency requires that pecuniary externalities be ignored, but a single firm would take them into account, so long-run efficiency requires many firms to ensure that pecuniary externalities are not prevented.

The central idea is that when an innovation, or the introduction of a new product, competes with an existing product, current firms will be less likely to introduce the product than would a new firm that does not have an existing product in the market. This is simply a reflection of the marginal revenue from the introduction of the new product being lower for firms that lose sales on existing products. Existing firms will still introduce new products as long as marginal revenue exceeds marginal cost, but there will be some cases in which marginal revenue is lower than marginal cost for existing firms but not for new entrants. Pigou (1924) correctly noticed, however, that the lower marginal revenue for existing firms is nothing more than a transfer to consumers in the form of consumer surplus on the old version of the product. In a world with zero transactions costs, this would not affect efficiency because consumers could bargain with the existing firms and give them a lump-sum transfer to introduce the new product. But in a world where transactions costs prohibit consumers from organizing and striking this bargain, allowing new firms to inflict pecuniary externalities on the existing firms is necessary for the market to attain efficiency.

Consider a very simple example. Assume that Pigou's (1924) gas light utility has a daily demand $Q = 10 - P$, the fixed costs are all sunk, and $MC = 0$. The profit maximizing price is 5, yielding daily net revenues of 25. Assume that the demand for electricity would be $Q = 20 - P$, and that electricity can be produced for a daily fixed cost of 99, after which $MC = 0$ for additional output. Further assume that because of the increased desirability of electricity over gas, consumers always would be willing to pay 11 per unit more for electricity than gas, so if the price of electricity is 11 or less, the demand for gas is zero. The profit-maximizing price for electricity is 10, yielding daily revenues of 100, and, after the daily fixed cost of 99, daily net revenues of 1. If the gas utility introduced electric service, its daily net revenues would fall from 25 to 1, so it would want to delay the introduction of electricity to maximize its profits, but a new firm would not account for the pecuniary externality in the form of the capital loss to the gas utility and so would have the incentive to produce electricity. The very simplicity of this example helps illustrate the possibility that a monopoly supplier can have an incentive to prevent the introduction of a more efficient alternative in a competitive market.

In a comparative statics setting such as that developed by Bator (1958), monopolies are inefficient because they produce too little output. In a dynamic setting, monopoly power can also result in inefficiencies because a single firm has an incentive to take account of the pecuniary externalities that innovation can have on the firm's existing investments. Thus, the inefficiencies from monopoly are larger than the simple comparative statics model of monopoly suggests.

At the beginning of the 20th century, railroads were by far the dominant means of long-distance travel, but by the end of the 20th century they had been replaced by airlines and automobiles. If these railroads were such dominant economic powers early in the century, one must wonder why they did not expand their transportation businesses so that now we would be flying on Norfolk and Western Airlines or Union Pacific Airlines. In fact, railroads have expanded somewhat into trucking through piggyback operations (in which trailers are shipped on railroad cars). But note that because piggyback operations are complementary to rail shipping, they can enhance the value of their railroad capital, whereas airline travel is a substitute. Because of the im-

mense fixed capital in the form of track, depots, and so forth, the railroads had a disincentive to expand into air travel because of the pecuniary externality, and new firms that did not have any reason to take account of the pecuniary externality created the air travel industry.

This same line of reasoning can help explain why mainframe computer firms were reluctant to enter the market for personal computers or why major typewriter manufacturers such as Royal and Smith Corona did not enter the PC-based word-processing market. In the rapidly evolving market for microprocessors, Intel is the dominant firm in the 1990s and has an incentive to delay the introduction of new microprocessors to recoup the large up-front investment that must be made to introduce a new-generation chip. Although other firms have only a small part of the market, the fact that there are potential competitors makes this a contestable market and makes the market leader introduce innovations more rapidly than if there were no competition. A lack of contestability would allow Intel to delay new chip introductions to maintain the value of its investment in earlier designs and avoid a pecuniary loss. In a world of rapidly changing tastes and technology, the fact that existing firms take into account pecuniary externalities, whereas new entrants do not, works against the presence of longstanding corporate dynasties.

The fall of the retailing giants of the early and mid-1900s, such as Sears and Roebuck and Montgomery Ward, to new entrants, such as Wal-Mart, helps to highlight the role of pecuniary externalities in the dynamic process of competition. The major existing retailers located stores primarily in major cities, and consumers in smaller and medium-sized towns had to drive into larger towns to shop at these retail establishments. Sam Walton's competitive strategy was originally based on locating stores in these smaller towns where the major retailers did not have existing stores. The success of the Wal-Mart chain in these towns brings up the question of why the other major retailers had not located stores there as well. Because the opening of a new Sears or Wards in one of the smaller towns would have lowered the revenues at their stores in larger towns that were receiving drive-in business, the value of opening these stores would have been lower for the existing firms than it was for Wal-Mart, whose sales at these stores were all new. Because Wal-Mart did not take into account the value of these pe-

cuniary externalities, whereas the existing stores did, Wal-Mart had a larger incentive to open stores in smaller markets. The ability of new firms to inflict pecuniary externalities on existing firms helps to enhance economic progress and innovation created by the dynamic process of competition.

Similarly, automobile manufacturers have less of an incentive to introduce innovations that will reduce the value of used cars if they lease a substantial fraction of their cars rather than selling them outright. Even frivolous innovations, like the major annual style changes that occurred in the 1950s, reduce the value of used cars. When cars are sold, such changes make sense because they reduce the attractiveness of used cars relative to the manufacturer's new output; but when cars are leased, it is the manufacturer that suffers the pecuniary loss. One should expect innovation to be less common on models that have a higher lease-to-sales ratio, and one should expect auto manufacturers that sell a larger fraction of their output to innovate more than those that are more likely to lease.

Following this same logic, an argument commonly viewed as a fallacy can be seen in a new light. The argument is sometimes made that manufacturers have the ability to produce better or longer lasting products but hold them off the market so as not to hurt sales of the currently produced line of products. For example, assume that a firm is producing a product with a durability of 1 year. The firm has a patent right enabling it to earn monopoly economic profits of \$30 million per year. Now, suppose the firm also has a patent right to produce a version of the product with a 5-year durability. Production of this 5-year version of the product would generate an economic profit of \$20 million per year, but it would drive the 1-year version of the product out of the market. Because this firm will take into account the pecuniary externality created by the introduction of the longer lasting version of the product, the firm will not introduce it. If a new firm had the patent for the 5-year version, it would enter the market and produce because it would not account for the pecuniary externality imposed on the other firm.

One might even imagine cases in which the existing firm would be willing to purchase the patent from the new firm to keep it from entering the industry. Presumably, the total value of the 5-year version to consumers would be higher under the assumption that it would drive

the 1-year version out of the market. There would be the potential for a mutually beneficial trade in the form of a lump-sum transfer from consumers to the firm to induce it to produce the 5-year version, but as long as high transactions costs are present, this trade will not occur.

Shopping centers, which typically charge rent based on a store's gross sales, have an incentive to take account of pecuniary externalities when making decisions on leasing to new stores, because the owner of the shopping center will suffer some of the pecuniary externalities that are inflicted on shops that have reduced sales due to close competitors. Indeed, shopping center leases often have clauses that prevent pecuniary externalities by preventing the shopping center owner from leasing to close competitors of existing shops. Thus, the ability of new shopping centers to be created to compete with existing centers is an important part of the competitive process. This applies to the automobile case discussed earlier as well. Auto manufacturers that lease more of their cars do have a pecuniary incentive not to innovate as much, but this is tempered by having to meet the challenges of competing firms.

In all of these examples, the incentive to account for pecuniary externalities arises only when firms have some monopoly power so that they can reduce the ability of competitors to inflict pecuniary externalities on them. The shopping center management could not afford to prevent pecuniary externalities among its tenants if a competing shopping center could take its customers, but the shopping center is sheltered somewhat from competition because it takes time to build a competing shopping center and because locational constraints will likely keep some distance between shopping centers, providing some locational rents. Similarly, starting up an airline is a capital-intensive endeavor, creating a barrier to entry that sheltered railroads from airline competition for a period of time. But all the above examples show that, in the long run, competitive forces ended up hurting the profits of firms that tried to preserve the value of their existing capital as new technology reduced its value. The key point is that firms have an incentive to take account of pecuniary externalities only if they can be sheltered from the effects of competitors' pursuing activities that would inflict pecuniary losses. Otherwise, the competitive market pushes firms to take their pecuniary losses to keep up with the competition. This pro-

vides another reason why monopolies generate welfare losses for the economy.

Monopolists have the incentive to inefficiently take account of pecuniary externalities, so monopolies create welfare losses in excess of those that result from their restriction of output. The static model of monopoly assumes an unchanging product and does not incorporate the opportunity for product innovation. When such changes create the possibility of pecuniary externalities, another avenue for monopolistic inefficiency is opened. Thus, contestable markets play the crucial role of creating an economic environment within which pecuniary externalities can be allowed to occur.

POLITICS AND PECUNIARY EXTERNALITIES

In a simpler world, the optimal government policy response would be to clearly define and enforce property rights to the ownership of all resources, goods, and services but not assign property rights to the value of those resources. In the real world, where such enforcement is not feasible for many resources, such as air and water, the alternative has been to allow the government to decide, through the use of political markets, public policy toward externalities. As Becker (1983) has modeled the process, interests on all sides of an issue weigh in with their preferences, and the legislature weighs the marginal political costs and benefits to determine a policy. For example, industrial polluters and environmentalist groups lobby to try to move public policy in a direction they prefer, and the democratic decision-making process produces an outcome. As noted earlier, when there are no transactions costs, resources will be allocated optimally, but as Downs (1957) noted in his seminal analysis of democratic decision making, there are high transactions costs that keep many citizens from participating in, or even becoming informed about, political decision making.

The problem of pecuniary externalities is relevant because whereas McDonalds may have no ownership over the right to allow Burger King to open a restaurant nearby, in politics everything is negotiable, and businesses rightly place as much emphasis on costs imposed on them through pecuniary externalities as through technological exter-

nalities. If the profits of an industry are being threatened, it does not matter to those in the industry whether the threat is from a technological or a pecuniary externality. When medflies threatened orange growers by spreading disease from one orange grove to another, which is a technological externality, the government took action to control the externality; but when domestic fruit producers are threatened by the lower prices of foreign competitors, the government also takes action in this case to protect them from a pecuniary externality. The political process has inefficiently given them a right not only to the ownership of their assets but also to the value of those assets.⁵

If changes to the status quo required unanimous approval, then the political system would essentially give everyone a right to the present value of future income. Any change that would lower someone's income could only be approved if those suffering pecuniary externalities were compensated. Under simple majority rule the protection is not so complete, but the political process still offers people substantial protection against pecuniary externalities. State and local regulations such as the requiring of occupational licenses, zoning, and other growth restrictions can serve such purposes. At one time, federal regulations required that anyone wanting to open a bank, or any airline wanting to expand its routes, had to demonstrate that there was a "need" for such services, which essentially meant that existing businesses could not handle the business proposed to be undertaken by the applicant. Such regulations were designed to prevent incumbent firms from suffering pecuniary externalities.

Even if the political marketplace is viewed as selling laws to the highest bidder through lobbying and rent seeking, high transactions costs work to the favor of the incumbent monopolist, who is the pecuniary loser from moving to a competitive situation, and against the consumers/voters, who would stand to be the pecuniary winners. The key thing is that politics does not distinguish pecuniary from technological externalities.⁶ It is telling that when pork barrel expenditures are undertaken, the government expenditures for factor payments to resources are counted in the political process as a political benefit rather than as a cost.⁷ The jobs created by a pork barrel project represent the labor cost of the project, for example, but this cost counts as a political benefit. The resulting factor payments create a pecuniary gain to re-

source suppliers, and because political markets allow individuals to assert a claim to the value of pecuniary gains and losses, an inefficiency is created.

Much of the political process involves protecting people from suffering the adverse consequences of pecuniary externalities. Government transfer payments to individuals are often compensation for pecuniary externalities created by the market. Unemployment compensation given to those whose jobs are lost through the competitive process, subsidies to farmers hurt by falling crop prices, and tariffs and quotas protecting industries from foreign competition are just a few examples of government actions taken to offset pecuniary losses imposed by the market. Economists have long noted the inefficiencies of these types of activities. When one recognizes that all of these different policies are government attempts to mitigate the effects of pecuniary externalities, this provides a general principle that unifies these examples and allows specific policies to be viewed as a more general attempt by government to provide people with a right to maintain the value of their assets in addition to just protecting the owner's right to use the assets.

In market situations, the pecuniary winners will almost always far outnumber pecuniary losers, but because most of the loss due to a pecuniary externality is a transfer, each pecuniary loser suffers more of a loss than each pecuniary winner gains, on a per person basis. Referring again to Figure 1, the gain is $A + B$ and the loss is B , but because the gain $A + B$ will be distributed among a large number of beneficiaries but the loss B will be borne by only a few, each loser loses more than each gainer gains. Because transactions costs depend critically on the number of individuals, pecuniary winners from the market process are at a bargaining disadvantage in both private and public sector action. But in private markets, individuals do not have to compensate those who suffer pecuniary externalities; nor do the losses even have to be taken into account by market participants and the market process more generally. Government action, on the other hand, always reflects pecuniary losses and frequently incorporates transfers to compensate the pecuniary losers. Thus, government action inherently works to retard efficiency-enhancing changes from the status quo, slowing the rate of welfare growth normally produced by dynamic private markets.

McDonalds may not have the explicit right to prevent pecuniary losses inflicted by Burger King, but if existing businesses can influence zoning regulations, land use planning, and the issuance of business licenses, it may have more of a property right to maintain the pecuniary value of its assets than is typically recognized. Similarly, when people are granted the right to keep their jobs, such as is done with academic tenure, workers are given property rights not only to their labor but to the return they earn from their labor. It is becoming increasingly common to see existing businesses be given a say in the conditions under which new businesses can enter the market (the successful opposition of many small downtown merchants to a new Wal-Mart coming to town is an example), and it is becoming increasingly difficult for employers to fire their workers, giving workers a property right to their jobs and not just their labor. These examples show how public policy is moving toward the protection of people from losses due to pecuniary externalities. As the pace of technological progress and innovation have grown, so has the presence of pecuniary externalities and the demand for government to use public policy to correct for them.

If property rights were limited to the right to own and use property unencumbered by the interference of others, and if all scarce resources had clearly defined property rights, technological externalities would be prevented. The political process goes further by allowing individuals to assert claims not only to the use of resources they own but also to the value of those resources. Fluctuations in the value of resources are an integral part of the market process, however, and the efficiency of the market process is impaired when public policy acts to prevent pecuniary externalities. If the legal system made it clear that rights to the ownership of economic resources would be protected but rights to the value of resources would not, the problem would be reduced. However, when political decisions rely more on democratic politics than on legal rules, the opportunity to use the political system to be compensated for pecuniary externalities increases. In a political environment, rent seeking for compensation from harm due to pecuniary externalities may even have an advantage over other types of transfers, because pecuniary externalities do impose costs, increasing the apparent legitimacy of a claim for compensation.

CONCLUSION

In theory, the distinction between technological and pecuniary externalities is straightforward, and economists have long known that it is optimal for public policy to take no account of pecuniary externalities. However, in many cases pecuniary externalities are treated no differently from technological externalities in the real world, resulting in allocative inefficiencies. Within a neoclassical framework such as that outlined by Bator (1958), externalities result in a market failure because the market mechanism ignores both technological and pecuniary externalities. A symmetric problem occurs in the public sector, however, because the political system also does not differentiate between them and stands equally ready to compensate for the effects of both pecuniary and technological externalities. This becomes apparent when one recognizes the role that interest groups play in determining the direction of public policy and when one recognizes that an interest group petitioning the legislature to remedy the harm the group suffers from an externality is harmed just as much from a pecuniary externality as a technological one. In the same way that technological externalities create a market failure because market participants treat technological and pecuniary externalities the same, pecuniary externalities create a government failure because the public policy process treats both types of externalities the same way.

Economists have a tendency to simply ignore pecuniary externalities because they should be ignored for public policy purposes. However, an examination of pecuniary externalities can lend substantial insight into the operation of the market system and the process of public policy making. Because pecuniary externalities are an integral part of the market adjustment process, they help define another reason beyond Coase's (1937) framework for why there are natural limits on the sizes of firms. Firms take into account the pecuniary costs that changes in business plans (such as introducing a new model or producing a new product) impose on their existing business, but for efficiency, these pecuniary costs should be ignored. Other firms in the market ignore the pecuniary externalities they create for their rivals and, because of potential competition, give firms an incentive to ignore these costs internally lest they lose out to more nimble rivals. Un-

derstanding the role of pecuniary externalities in the market process can lend substantial insight into the way that markets function.

From a public policy standpoint, pecuniary externalities also play an important role. In a public choice framework, political actions to offset the costs of pecuniary externalities create a type of government failure. For purposes of public policy, pecuniary externalities should be ignored, but this does not mean that they are unimportant, and their role has been underappreciated by economists who tend to neglect those externalities that are merely pecuniary. This article takes a step toward remedying that by showing how pecuniary externalities are relevant to both private sector and public sector resource allocation.

NOTES

1. Sometimes private contracts can create a right to the value of assets through insurance or purchase agreements and the value of an asset can be used as collateral to borrow against. In all such cases, any uncertainty regarding the value of an asset is then transferred to another market participant, but it does not disappear.

2. If an asset is exposed to the risk of pecuniary externalities, its market value should fall, which will increase the return to the asset. Higher expected returns can be viewed as compensation for the greater risk of being harmed by a pecuniary externality.

3. However, the North American Free Trade Agreement (NAFTA) did not uniformly lower trade barriers for all industries but provided protectionist favors for selected industries. It is easy to understand how firms not receiving protectionist benefits would believe they are entitled to compensation, but this does not change the fact that they are asking to be compensated for a purely pecuniary impact.

4. In a world of zero transactions costs, the doctor and the confectioner could bargain to an optimal solution, but the spirit of Coase's (1960) argument is that often transactions costs are significant so parties cannot bargain to allocate resources efficiently.

5. When a number of states filed lawsuits against tobacco companies to recover Medicaid costs they incurred for tobacco-related illnesses, South Carolina Attorney General Charlie Condon said that tobacco farmers should be compensated if the lawsuits reduced the demand for their crop, according to the *Spartanburg Herald-Journal* (May 11, 1997, p. B7).

6. McKean (1958, 136-44) gave an excellent discussion of pecuniary externalities and public policy and noted that sometimes it is difficult to distinguish pecuniary from technological externalities, even though the distinction always remains valid. This difficulty can make it easier for rent seekers to gain political protection from pecuniary externalities.

7. The impact of factor payments' being considered as benefits rather than costs was first addressed by Weingast, Shepsle, and Johnsen (1981).

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