Stiglitz, Joseph E. (1943-)

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Personal background

- born 9 February 1943, Gary, Indiana
- BA Amherst College, 1964; Ph.D. Massachusetts Institute of Technology (MIT), 1967
- Joined faculty of MIT in 1966
- Combined careers of economic theorist and teacher, at a succession of universities, with government consulting, 1966-93 and 2000-
- Research fellow at University College, Nairobi, Kenya, under Rockefeller Foundation grant, 1969-71
• Received the John Bates Clark Medal in 1979, awarded biennially by the American Economic Association for the most distinguished work by an economist under the age of 40

• Founding editor of the Journal of Economic Perspectives, 1987

• Served on the United States Council of Economic Advisors as a member, 1993-95, and as chair, 1995-97

• Chief Economist, World Bank, 1997-99

Selected major works


Summary

Joe Stiglitz’s ambition was to remake economic theory in a way that would provide insights into problems of imperfect information, the costs of communication, and innovation. In the process of realizing that ambition, he contributed to a revolutionary shift in economics from Walrasian models of the market – in which information is costless and private rationality leads as if by an ‘invisible hand’ to a socially rational outcome – to a post-Walrasian paradigm in which markets solve, but only imperfectly, problems of screening for hidden characteristics, providing incentives for imperfectly observed behaviours, and creating incentives for innovation.

Stiglitz’s most profound insight is that if information is costly to acquire, prices have a role other than clearing the market – in particular, as screening and incentive devices. This implies that markets may not clear. This theoretical insight has helped to provide a new basis for the synthesis of Keynesian and neoclassical economics, and has brought the study of developing economies back into the mainstream. For those living and working in developing countries, where markets are not well-developed and unemployment and rationing are pervasive, pre-Stiglitzian neoclassical economics with its market-clearing predictions seemed to many irrelevant and led them to turn to neo-Keynesian, Ricardian, and Marxian perspectives. Stiglitz’s work was largely responsible for attracting some of the best minds of the new generation of economists in developing countries to neoclassical economics.

Stiglitz’s work includes over 300 technical papers that have proved central theorems in many fields: the theory of uncertainty and information, finance, taxation, industrial organization, development, and macroeconomics. His intense schedule of peripatetic
lectures and consulting for governments means that unlike many theorists, Stiglitz brings a tremendous knowledge of institutions to his theoretical work. His modus operandi is to identify a problem in a particular market, develop a new set of tools to model the way individuals respond to that problem, and show how the interaction of their responses affects the industry and the macroeconomy. He would thus try to examine the implications of the information problem at all levels – the level of the individual and the firm, the industry, and the economy. Then he would show how that set of tools proved useful in a wide range of further applications. Finally, he would demonstrate how more realistic descriptions of the economy could be obtained by combining into a single model a combination of information problems.

Stiglitz is notable for having written not only important theoretical papers, but also provocative ‘thought pieces’ on broad themes. These themes include the role of the government in markets, the politics of reform, and the possibility of modeling economic behaviour in terms of a broader set of postulates than self-interest. This work clearly reflects his hope of changing the Weltanschauung of economists and advancing policies that he believes will improve welfare.

1 Biographical data

Joe Stiglitz was the middle of three children. After the failure of an earlier business, his father became an independent insurance agent; part of his job was to find new insurers for firms whose businesses had burned down and whose insurance policies had been cancelled. An important theme throughout Joe Stiglitz’s career has been the way in which the economy handles risk. Stiglitz’s mother worked in the family insurance business when Stiglitz was young and later taught elementary school in a low-income inner city
neighbourhood of Gary, Indiana. After she retired from elementary education, she worked in adult remedial education, where she met up with some of the same students whom she had taught as children. The role that education plays as a screening process that enables high-ability people to obtain a higher wage, partly, however, at the expense of others, was a second important early theme of Stiglitz’s work.

Stiglitz’s genius was recognized early. In high school, he was assigned independent study in lieu of some of the regular classes, which he had outstripped. After following his older brother at Amherst College, where he studied economics, physics, and mathematics, he obtained a Ph.D. from the Massachusetts Institute of Technology (MIT) in two years. He started teaching at MIT and then moved from university to university: Yale (1968-74), St Catherine’s College, Oxford (Visiting Fellow, 1973-74), Stanford (1974-76), All Souls’ College, Oxford (1976-79), the Institute of Advanced Studies at Princeton (1978-79), Princeton University (1979-88), and Stanford (1988-to date).

In 1993, Stiglitz accepted an invitation to join President Clinton’s Council of Economic Advisors, of which he was chair from 1995-1997. By the time he became Chief Economist of the World Bank in 1997, Stiglitz was famous, and he used his position to argue publicly against policies of the International Monetary Fund (IMF) towards the East Asian financial crisis of 1997-99 (see INTERNATIONAL MONETARY FUND; WORLD BANK). In evaluating any policy, there are judgements one has to make concerning the consequences of the policy, and tradeoffs one has to make between competing goals. Stiglitz’s positions on both these points led to conflict with other officials in Washington. In November 1999, he resigned from the World Bank and
returned to Stanford University. There he created an institution that, by providing training to policymakers from developing countries, was intended to increase their ability to negotiate with the IMF.

2 The economics of information

When Stiglitz began working on the economics of information, James Mirrlees had been working for a few years on the problem of how a government could design an optimal tax schedule, taking into account that government could observe incomes, but not ability and effort (Mirrlees 1971). Stiglitz’s key insight was to recognize the similarities between this problem and a broad set of problems that arise in markets where the characteristics of the commodities exchanged are not known to one of the parties to the transaction. For example, insurance companies and banks want to design a menu of offers that will maximize their profits, taking into account that they know the distribution of risks but not each individual’s characteristics. Employers want to design labour contracts to maximize productivity, taking into account that they can only imperfectly observe workers’ ability and effort. Together with a small group of pioneers in the 1970s, and influenced in particular by Akerlof (1970) and Spence (1974), Stiglitz devised models in which these kinds of problems could be formally analysed. This work came to be called ‘the economics of information’. It showed that much of what economists had believed on the basis of the Walrasian model was not robust to considerations of imperfect information.

A. Hidden characteristics

It is interesting to be more specific and study a famous model that introduces central themes in Stiglitz’s work. Rothschild and Stiglitz (1976) constructed a simple model of
the insurance market: individuals differed in their probability of having an accident, they
knew that they differed, but at the time the market opened, the insurance firms knew only
the distribution of risks in the population and did not know who was high risk or low risk.
The results of their model were startling and confusing. Most of their argument was made
by the analysis of the canonical textbook apparatus of consumer choice – budget lines
and indifference curves.

Consider an individual whose situation is described by his income if he is lucky
enough to avoid an accident ($W_{\text{NA}}$) and his income if an accident occurs ($W_{A}$). Without
insurance, his income in these two states, ‘no accident’ and ‘accident’, is $(W, W-d)$,
where $d$ represents the damages incurred in the accident. An individual purchases
insurance in order to alter his pattern of income across these two states of nature.

As a benchmark case, suppose that insurance companies knew the individual’s
probability of accident. Given this probability of accident, let $\hat{W}$ denote the individual’s
expected income. Then competitive equilibrium would be at a point A, illustrated in
Figure 1, where the insurance company breaks even and the individual’s indifference
curve, denoted $\hat{U}^{k}$, is tangent to the budget line. Since risk averse individuals who are
offered a fair price for insurance will fully insure, the equilibrium is along the 45 degree
line. The line that goes through the initial endowment point E and the point A is the locus
of contracts at which an insurance company breaks even (which Rothshild and Stiglitz
referred to as the fair-odds line).

But now suppose that individuals differ in their probability of having an accident, and
that they know that they differ. Clearly, the high-risk individual has lower expected
wealth, denoted by $\tilde{W}$ in Figure 2. If the insurance company could observe who was low-
risk and who was high-risk, then using the same reasoning as above, the equilibrium contracts would be at A and B in Figure 2: high accident probabilities give rise to a flatter indifference curve (individuals are willing to pay more, at the margin, for insurance), and also to more costly insurance (a flatter fair-odds line). If, however, the insurance firms do not know the characteristics of individuals, then clearly they cannot offer contracts A and B (for all individuals would in that case claim they were the low-risk type and choose the contract A, and the insurance companies would not break even). Offers that survive the competitive process also cannot specify a price at which customers choose to buy all the insurance they want, because the high-risk individuals would always purchase more insurance at that price than the low-risk individuals, and the insurance firms would not break even. Offers of contracts instead consist of both a price and a quantity.

Figure 3 illustrates at point C a contract that would break even if all individuals purchased it (which Rothschild-Stiglitz called a ‘pooling’ contract). Is this, however, an equilibrium? Rothschild-Stiglitz pointed out that no pooling contract could be consistent with individuals’ and firms’ incentives. Firms would perceive that they could benefit from deviating in order to ‘pick off’ the low-risk individuals. Consider what would happen if one firm were to announce that it was willing to sell a contract C′ with slightly less insurance coverage than C but at a lower price per dollar of coverage, with the point C′ located in the shaded area in Figure 3 – below the high-risk individual’s indifference curve, but above the low risk individual’s indifference curve, and above the fair-odds line for the average risk? A firm that did this would attract only the low-risk individuals as customers and would make a profit, while causing the contract C to make a loss. Thus the contract C cannot be an equilibrium. Rothschild and Stiglitz showed that the only
possible equilibrium is one in which the market distinguishes information by offering a contract B with complete coverage (that will be chosen by the high-risk individuals), and a contract D with partial insurance coverage (which the low-risk individuals prefer to full insurance at B); see Figure 4. The market ‘solves’ the screening problem, but at the cost of foreclosing otherwise feasible and desirable exchanges.

In later work, Stiglitz extended this insight to explain puzzles in equity, credit, and labour markets. For example, when insiders in a firm have more information than outsiders, the controlling insiders’ willingness to issue equity conveys a signal that says that on average the shares are overpriced, and the market responds by lowering the price. This discourages firms from issuing new shares and provides an important explanation for the observation that firms have limited access to equity (Greenwald, Stiglitz and Weiss 1984). The prediction that when firms issue new shares the share price falls, and when they buy back shares, the share price rises, has been widely confirmed (a survey of theory and evidence is in Stiglitz 1992).

When prospective borrowers have more information than lenders about the riskiness of their investments, there are situations where a lender will set his interest rate below the market-clearing rate. He will not wish to raise his interest rate to ‘what the market will bear’ because an increase in the rate causes the lowest risk borrowers to drop out of the market, and thereby may actually reduce the lender’s expected return to lending. In this case, credit rationing will occur, as demonstrated in Stiglitz and Weiss (1981). Beginning with work in the late 1980s, discussed below, Stiglitz drew important consequences for macroeconomics from the failures in equity and credit markets.
In many settings, individuals can, at a cost, provide credible information about their characteristics. What were ‘hidden characteristics’ become public information. Will individual choices lead to the efficient level of investment in information? Stiglitz showed that the private returns to the provision of information generally differ from the social returns. Individuals are likely to spend too much on ‘hierarchical screening’ – that is, on screening for characteristics that individuals value in the same way – and too little spending on ‘matching screening’ – on screening for characteristics that individuals value in different ways but that is valuable by permitting better matches, e.g. between workers and jobs, or investors and financial assets (Stiglitz 1974, 1982).

The fact that the investor-in-information must be able to obtain a return on average from his information-gathering activity led to a fundamental result in finance. There had long been a theory in finance, called the efficient markets theory, that the observation of prices in capital markets suffices to reveal all relevant private information (see EFFICIENT MARKET HYPOTHESIS). Grossman and Stiglitz (1980) showed that the theory was incorrect: if information is costly and markets are competitive, then there must be an ‘equilibrium degree of disequilibrium’ – persistent discrepancies between prices and ‘fundamental values’ that provide incentives for individuals to obtain information. In capital markets, prices serve two functions: besides being used in the conventional way to clear markets, they also convey information. When individuals invest in information and thereby learn that the return to a security is going to be high (or low), they bid its price up (or down), and thus the price system makes that information publicly available. But if all information were publicly conveyed, there would be no incentives for individuals to invest in information. Grossman and Stiglitz’s work stimulated further
work in finance. Kyle (1989) showed that a number of puzzles could be resolved by assuming that the informed traders are imperfect competitors, who take into account the effect their trading has on prices. Under that assumption, prices are never fully revealing and, therefore, a positive amount of costly private information is always obtained.

In many settings, differential information can be a source of pure economic rents. Stiglitz argued that firms recognize that fact and exploit it by actually creating information problems. For example, stores know that it is costly for customers to search, and Salop and Stiglitz’s (1977) paper on ‘Bargains and Ripoffs’ showed that stores can exploit that (by varying their prices) to extract rents from customers who have high search costs. The market equilibrium prices thus serve to discriminate (imperfectly) among individuals with different search costs. Their results overturned a standard theory called the Law of the Single Price (a given commodity is sold at the same price in all stores). Edlin and Stiglitz (1995) extended this idea to create a theory of managerial entrenchment. They argued that differential information between managers and outsiders is a source of rents to managers, and that managers may preserve their jobs and increase their rents by investing in activities for which information asymmetries are particularly large.

B. Hidden behaviours

Besides the problem of hidden characteristics, the problem of providing incentives for hidden behaviours also changes the way the market mechanism works. One may try to write a contract that fully specifies the desired actions, but that will require monitoring, and monitoring is costly and imperfect. Another response to the problem of hidden behaviours is to motivate the individual through an incentive contract. This is the central
idea of principal-agent theory, in which a principal, who delegates a task to an agent, designs a contract that makes payment depend on observable circumstances (e.g. revenues) that are correlated with the desired but unobservable actions of the agent. Principal-agent theory was developed contemporaneously by Stephen Ross, James Mirrlees, and Joe Stiglitz. Stiglitz (1974) addressed a particular puzzle that had been recognized since at least Alfred Marshall – the apparent inefficiency of the institution of sharecropping, where the tenant receives only a share of the marginal return to his effort (see MARSHALL, A.). Stiglitz showed that sharecropping was advantageous to tenants and landlords because of the savings in monitoring costs compared to a wage system with costly monitoring, the increases in output compared to a wage system with imperfect monitoring, and the reduction in risk borne by tenants compared to a system where workers pay fixed land rents but do not have access to risk markets.

Four insights in this paper have been important for further developments in economics.

1. It is sometimes useful to take the transaction, rather than the market, as the unit of analysis.

2. There is a trade-off between incentives and insurance.

3. The extent of incentive problems in an economy depends on the distribution of wealth.

4. Agency problems are also pervasive in a complex modern economy, for example, in the relationship between the owners of a firm and the manager.

One of the most interesting developments in principal-agent theory that other economists have pursued (see Baker 2000) is the study of the dangers in focusing
incentives on easily observable variables (e.g. in car repair services, the mechanic’s billings), because such incentive structures divert attention from more important but more difficult to measure outcomes (e.g. careful diagnosis and correction of car malfunction).

Reputations also play an important role in providing incentives. For reputation to be an effective incentive mechanism, a firm must have something to lose. That something is income. Carl Shapiro (1983) developed a model of reputation in which, for all but the lowest possible quality goods, price exceeds marginal cost in competitive equilibrium. The price-cost margin gives the firm a future stream of rents as long as it maintains its reputation. The prospect of the loss of these rents if it ‘milks’ its reputation by providing less than the promised quality induces the firm to actually live up to consumers’ expectations. Why doesn’t competition lead to price-cutting? Consumers come to learn that if the price is too low, firms do not have an incentive to maintain their reputation, and therefore the offer of high quality goods at a low price is not credible.

Joint work between Shapiro and Stiglitz (1984) extended this idea in a very important way to provide a model that has come to be called the ‘shirking model.’ Their work envisaged a setting where the firm could observe the effort of workers only randomly, and there was no fixed retirement date. The only penalty that a firm could impose on a worker for shirking was to fire him. In such a situation, an employer has an incentive to pay a wage above that of others. For then, if the employee loses his job, he will suffer a real loss; and thus, the employee will have an incentive not to shirk. But as all employers do that, none benefits. This would seem to be like the case where when every spectator in the stadium stands up to get a better view, no one sees any better. But unlike that case, the fact that all employers raise their wage has a real effect. It creates unemployment: at
the higher wage firms hire fewer workers, but no fewer individuals seek work. Now a worker who is fired cannot immediately find another job but enters the unemployment pool. In equilibrium all firms pay the same wage above market-clearing; and unemployment, which makes job loss costly, serves the role of creating work incentives. While this role is socially valuable, the equilibrium unemployment rate will be higher than the optimum.

The ‘shirking model’, Grossman-Stiglitz’s (1980) capital markets model, and Rothschild-Stiglitz’s (1976) insurance model all illustrate central ideas developed throughout Stiglitz’s work: endogenous information radically changes the way the market mechanism functions; the market mechanism can itself mitigate many problems of information (e.g. revealing hidden characteristics and creating incentives for hidden actions); but there are government interventions that could, in principle, improve upon the market outcome. For example, in the insurance model, the costs of separating low-from high-risk individuals (the limitations on insurance) may exceed the benefits: A government intervention that imposed the pooling outcome could in some cases make everyone in the economy better off. In the ‘shirking model,’ the market outcome does not maximize aggregate income. A wage subsidy would reduce unemployment and raise total income.

3 Macroeconomics

As discussed above, Stiglitz established that informational imperfections would limit the scope of equity and credit markets. In a series of papers with Bruce Greenwald and Andy Weiss, he drew out the implications for the failures of capitalism – the marked fluctuations in output and employment that have characterized capitalism throughout its
history. The argument was as follows: limitations in the scope of equity markets, combined with the assumption of significant bankruptcy costs, mean that firms behave in a risk-averse manner. They pay attention to own-risk, while traditional theory suggests that the only risk firms should care about is the correlation with the stock market. Higher levels of investment or production entail increased debt, and as debt is increased, the bankruptcy probability is increased. Firms will therefore produce and invest only up to the point where expected marginal returns equal expected marginal bankruptcy costs.

This has four implications:

*Amplification of small shocks*

Changes in the net worth of the firm and the riskiness of the environment affect the production and investment decisions of the firm (in contrast to the standard theory). For a highly leveraged firm, small changes in demand can result in large changes in output and employment. Thus, disturbances to the economy tend to be amplified.

*Persistence*

If for some reason net worth is reduced at a given time, production falls in subsequent periods. Only gradually will production be restored to normal, as net worth builds up again.

*Risk-averse banks*

Banks are a specialized kind of firm whose production activity is making loans. A reduction in the net worth of banks and an increase in the riskiness of their environment will lead them to contract their output – i.e. to make fewer loans, which has multiplier effects throughout the economy.
Worsening of the applicant pool for loans during a recession

For any given bankruptcy cost, there is a critical net worth such that, below that net worth, firms act in a risk loving manner, above that, in a risk averse manner. If the economy moves into a recession and firms find their net worth decreases, good (i.e. risk-averse) firms reduce their loan applications, bad (i.e. risk-loving ) firms increase their loan applications, and there is an increasing proportion of bad (i.e. low net worth) applicants. These effects may be so strong as to lead to a situation where the bank makes no loans at all!

During Stiglitz’s tenure as Chief Economist of the World Bank, the contrast between Stiglitz’s perspective on macroeconomics and the perspective based on well-functioning markets came to a head. These are two starkly different ways of looking at the world. If there are well-functioning markets, then opening up capital markets will lead to efficient outcomes. In this view, essentially adopted by the US Treasury Department and the IMF in the 1990s, the appropriate response to the 1997-98 East Asian financial crisis was to require, as a condition of IMF financial support, that the East Asian economies adopt contractionary fiscal and monetary policies. The contractionary monetary policy would raise interest rates and, at some point, reverse private capital outflows and restore the ability of the East Asian countries to repay their foreign debts (see ASIA PACIFIC, MANAGEMENT IN; EAST ASIAN ECONOMIES). Under the alternative view, taken by Stiglitz and other critics of the IMF, the increase in interest rates would seriously erode the net worth of debtors and, for reasons described above, the erosion of their net worth would lead to a recession that could not easily be reversed.
In the perfect markets view, the basic reason for the East Asian financial crisis was lack of transparency, or corruption, in the business practices of these economies, which frightened away foreign investors. However, Furman and Stiglitz (1998) argued that there was no basis for the view that a lack of transparency caused the crisis (although it aggravated the effects of the downturn once it began). They argued that small developing countries are financially fragile. There are pervasive externalities in banks’ and firms’ decisions to obtain short-term loans from abroad. Each takes the risk environment as given, and yet the aggregate set of decisions determines the risk of a financial crisis. Thus, Furman and Stiglitz argued that some limits on free capital markets were appropriate in developing countries. Stiglitz’s views ultimately were very influential. But the openness of his conflict with the IMF and US Treasury frayed his relationships with many people in Washington and hastened his departure from the World Bank.

4 Development economics

Whereas Stiglitz’s work in macroeconomics is highly controversial, his work in development economics is much less so. Before 1970, there was little understanding of the imperfections in markets in developing countries (see EMERGING COUNTRIES, MANAGEMENT IN THE). Economists that tried to design policies to fit the realities of imperfect markets in developing countries generally assumed rigidities in markets, but did not explain them by reference to a choice-based perspective. Stiglitz’s work in development economics played a major role in changing that. His central contributions were (1) to show that non-market institutions can be efficient responses to missing markets and high transaction costs; (2) to show that while (1) is true in partial
equilibrium, it may not be true in general equilibrium; and (3) to provide models of ‘development traps’ created by various types of positive feedback mechanisms.

Institutions

There is a widespread intuition that institutions that have emerged out of individual actions are optimal: they are there because their benefits outweigh the costs. Stiglitz’s work on sharecropping, discussed above, and on group lending (Stiglitz 1990) exemplifies that approach.

But as Stiglitz has remarked, that intuition is not compelling: ‘In a society that has had Jim Crow laws, how could one believe that institutions are optimal?’ Stiglitz’s later work showed that there is no necessity that the equilibrium set of institutions be efficient. For example, Arnott and Stiglitz (1991) examined the effects of a social institution that arises because of incomplete insurance in markets faced with moral hazard problems. They showed that informal social insurance may crowd out market insurance and lower social welfare – partly because it does not address the broader issue of information externalities. More generally, with endogenous institutions, developing countries may be caught in a vicious circle in which low levels of market development result in high levels of information imperfections, and these information imperfections give rise to institutions – for example, personalized networks of relationships – that impede the development of markets.

In work with Avishay Braverman, Stiglitz made another contribution to the debate over why some countries have failed to develop. Braverman-Stiglitz (1986) showed that when monitoring is costly and land contracts entail sharecropping, there are ‘biases’ in
the nature of the innovations that are adopted: landlords may resist innovations that increase output but exacerbate incentive problems.

**Positive feedback effects**

Another strand in Stiglitz’s work in development examines learning externalities that generate *positive feedback effects*. As a result of such effects, there can be multiple equilibrium behaviour patterns. Through accidents of history, one pattern comes to be entrenched as the standard. For example, in Sah and Stiglitz (1989), a high level of expenditures on R&D by one firm may have sufficiently high spillovers that it increases the marginal return to another firm of doing research. Thus there may exist one equilibrium in which R&D is low, and another where R&D is high. Socioeconomic interactions may also give rise to multiple equilibria: if each individual looks to the apparent preferences of his peers to infer the appropriate behaviour, then there is a possibility of multiple self-sustaining norms. Hoff and Stiglitz (2001) termed this approach to development ‘ecological economics’. The term tries to capture the idea that economies with the same deep properties (technology and preferences) can have markedly different equilibria. Innovation can encourage further innovation, just as corruption can encourage further corruption.

In a celebrated model, Dixit and Stiglitz (1977) posed a question seemingly unrelated to development that, however, turned out to provide a building block in models constructed by other economists working in the new fields of endogenous growth theory and economic geography. ‘Will a market solution yield the socially optimum kinds and quantities of commodities, if there are multiple possible varieties of goods and each entails increasing returns to scale in production?’ They used a trick that turned out to be
very important analytically. By assuming a continuum of goods, the set-up lets the
modeller respect the discrete nature of many location decisions and yet analyse the model
in terms of the behaviour of continuous variables like the share of manufacturing in a
particular region. That paper gave rise to development models (e.g. Rodriguez-Clare
1996) in which an economy consists of three sectors: a low-technology sector, an
advanced sector, and an intermediate sector that produces an array of non-traded, i.e.
domestic, goods, modeled as Dixit-Stiglitz commodities, that are inputs into the advanced
sector. An expansion of the advanced sector increases the demand for these nontraded
inputs, and so lowers their average costs and increases the available variety. With a
greater variety of intermediate inputs, production in the advanced sector is more efficient.
It can thus be the case that when all other firms enter the advanced sector, it pays the
remaining firm to do so, but when all other firms remain in the traditional, low-
technology sector, it pays the remaining firm to do so, too. A low-level equilibrium can
therefore be sustained even when the economy is fully open to international trade.

5 Evaluation

Stiglitz’s work has proceeded by analysing models in which the implications of particular
information problems can be examined in idealized settings. The high level of
idealization and the very surprising (or at least counter-Walrasian) results often obtained
have led his harshest critics to see in his work a predilection for the intriguing exception
rather than the general rule: Granted that market failures occur, do they really matter?
From a staunch admirer, Avinash Dixit, one hears the statement that a paper by Stiglitz
begins with the phrase, ‘Assume there are two types’. But that is not a criticism. The
statement that ‘there are two types’ marks a radical departure from the Walrasian
paradigm. Walrasian models all begin with the implicit assumption that ‘there is only one type’ (i.e. among commodities selling in a single market, there are no hidden characteristics about which consumers care). Stiglitz’s work demonstrates that markets where there is ‘one type’ have properties markedly different from those with two or more types (i.e. where there is imperfect information).

Stiglitz’s work has led to a re-evaluation of the market mechanism (see, especially, Stiglitz 1992). Walrasian theory both overestimates and underestimates the actual virtues of the market. It overestimates the role of prices and fails to take account of the difficulties of making the price system work. But it understates central virtues of the market: its ability to solve, though only imperfectly, problems of selection, incentives, information gathering, and innovation – problems about which the Walrasian paradigm is silent. It remains an unsettled question whether the Walrasian paradigm is so limited that it does not provide a useful overview of the economy. A challenge for future work is to determine what information assumptions are appropriate in particular circumstances. This is important because results often depend sensitively on the information assumptions employed. By the 1990s, this question had become the subject of a very active research agenda.

A source of some misunderstanding in the evaluation of Stiglitz’s work is his treatment of the role of the state. Most of his work has focused on analysing how markets work. It has by and large not focused on analysing how the public sector works. His theoretical work has thus, by and large, not provided theorems as to what interventions a state, governed by rational maximizing behaviour of voters and politicians, actually would undertake. As early as 1975, Stiglitz wrote: ‘[T]o turn over an allocation process to
the public sector is to make it subject to ‘political laws’ which may be no less forceful …
and even less efficient—than the ‘economic laws’ which previously governed the
allocation process’ (Stiglitz 1975: 299). Those who have studied such ‘positive political
economy’ make use of the framework of asymmetric information that Stiglitz pioneered
in the market context (e.g. Laffont and Tirole 1993 and Grossman and Helpman 1994).
Stiglitz’s work has thus helped identify the theoretical and empirical questions on which
the resolution of the debate should turn. It permits us to see the possibility of constructing
models that embody as special cases the conservative, radical, and liberal worldviews.
‘Conservative’ economists, in arguing for a very limited role for the state, point to the
enormity of principal-agent problems between the electorate and politicians and between
politicians and bureaucrats. They posit the relative absence of such problems in the
private sector. ‘Radical’ economists, in arguing for extensive state intervention, point to
ways in which information-based imperfections in capital and labour markets make the
rich richer and the poor poorer. ‘Liberal’ economists, in defending a moderate role for the
state, argue that the government and private sectors are complements, not substitutes,
because the information and agency problems they face are not the same. They argue that
an imperfect government may mitigate the failures of the imperfect market.

6 Conclusion

Joe Stiglitz has played a leading role in formulating a paradigm that would be an
alternative to the Walrasian paradigm, and that would explain how economies process
and transmit information, select the set of goods to be produced, and innovate. His work
articulates four major themes:
• Economic behaviour is not just a response to scarcity; it is also a response to information problems. A key issue is understanding interactions of individuals who know that other individuals possess private information.

• The basic theorems of Walrasian theory are not robust in the presence of imperfect or costly information. Policy analysis based on that theory is misleading.

• The failures in equity, credit, and labour markets have important consequences for macroeconomics.

• Development is primarily a problem of changes in institutions, not an automatic catch-up process of capital accumulation.

• Important areas for future advances in economics are the identification of the information assumptions appropriate in particular circumstances, and the dynamics of institutional change.

KARLA HOFF
WORLD BANK

Further Reading
(References cited in the text marked*)

*Akerlof, G. (1970) ‘the market for “lemons”: quality uncertainty and the market mechanism,’ Quarterly Journal of Economics 84: 488-500. ( Buyers may be reluctant to purchase a product whose quality is known to the seller but not to the buyers, because they correctly fear getting stuck with a ‘lemon.’)

use to reward employees, firms need to consider the distortion of incentives that results when firms ‘reward for A while hoping for B.’)


* Grossman, G. M. and Helpman, E. (1994) ‘Protection for sale’, *American Economic Review* 84 (4): 833-850. (When special-interest groups make political contributions in order to influence the state’s choice of trade policy, politicians’ maximizing behaviour, which depends on total contributions and the welfare of voters, leads to inefficient trade policies as a political equilibrium.)


(Information and enforcement problems can explain a wide variety of institutions in the rural sector of developing countries.)

Future of Development Economics in Perspective, G. Meier and J.E. Stiglitz (eds),
Oxford: Oxford University Press, 389-459. (Theoretical advances in economists’
understanding of imperfect information, coordination failures, and institutions have
radically changed the focus of development economics. Development is no longer seen
as a process of capital accumulation that automatically occurs under free markets, but
rather as a difficult process of institutional change)


Economic Studies 56: 317-56. (When asset markets are imperfectly competitive and
each trader takes into account the effect his demand has on the equilibrium price of
assets, prices will not be fully informative of private information, and thus traders will
have an incentive to obtain costly private information.)

Cambridge, MA: MIT Press. (Industry regulation can be modelled as a political game.)

Economic Studies 38 (2): 175-208. (Assuming government does not know the income-
earning skills of individuals but does know the distribution of skills within the
population, there is an optimum earned-income tax schedule, and it will imply
distortions in labour supply.)


of Development Economics 49: 3–32. (When the modern sector of an economy depends
on nontradeable inputs produced with increasing returns to scale, multiple equilibria—
some entailing modernization, some not—can be sustained.)
* Sah, R. and Stiglitz, J. E. (1989) ‘Source of technological divergence between developed and less developed economies in developed and less developed countries’, in G. Calvo et al. (eds), Debt, Stabilizations and Development: Essays in Memory of Carlos Diaz-Alejandro, Cambridge, MA: Basil Blackwell. (In the presence of learning externalities, an economy can have multiple equilibria.)


* Spence, A.M. (1974) Market Signaling: The Information Structure of Hiring and Related Processes, Boston, MA: Harvard University Press. (The market value of signals, such as education, depends on the fact that the costs of signaling are correlated with hidden characteristics of individuals, such as ability.)


* Stiglitz, J.E. (1985). ‘Information and economic analysis: a perspective’, Economic Journal 95(0): 21-41. (Information economics shows that central assumptions of the Walrasian paradigm are indefensible, and that the main results of the Walrasian paradigm are not robust to considerations of imperfect information.)

information, there are a very large number of forces, operating through either selection or incentive effects, that can lead an increase in price in a given market to increase the quality of the good.)

* Stiglitz, J.E. (1990) ‘Peer monitoring and credit markets’, *World Bank Economic Review* 4(3) 351-366. (In group lending, such as undertaken by the Grameen Bank, the gains from improved monitoring can offset the costs of increased interdependence.)


**See also:** CAPITAL MARKETS; EFFICIENT MARKET HYPOTHESIS; INTERNATIONAL MONETARY FUND; KEYNES, J.M.; MARSHALL, A.; MARX, K.; RICARDO, D.; WORLD BANK
Figure 1

- Premium net coverage
- \( U^L \)
- 45°
- Net coverage
- Premium
Figure 2

- $A$ represents the point where the insurance indifference curve $\bar{U}^L$ intersects the 45° line, indicating a low price of insurance.
- $B$ represents the point where the insurance indifference curve $\bar{U}^H$ intersects the 45° line, indicating a high price of insurance.
- The point $E$ is where the high price of insurance indifference curve crosses the horizontal axis at $\hat{W}$, representing a relatively higher price of insurance for $W$. The 45° line $\hat{W}$ represents the midpoint where the prices are equal, indicating no price shock.
Figure 3
Figure 4