Special Feature D

Market Versus Government: Welfare-Economic and Mesoeconomic Perspectives

by Ng Yew-Kwang[1]

This Feature discusses the central issue of free markets versus government intervention in both the micro and macroeconomic domains. From the first welfare theorem, the market is efficient under certain conditions. However, in the presence of important external effects like pollution and greenhouse gas emissions, government intervention in the form of Pigovian taxation may be desirable. Poverty reduction and equality promotion may also be appropriate. Nevertheless, in the absence of considerations for efficiency, this promotion should be in terms of overall incomes. The mesoeconomic analysis that combines elements of micro, macro and simplified general equilibrium is then used to show that a change in nominal aggregate demand (possibly from money supply) may affect either the price level alone, or also aggregate output, making both the Monetarists and the Keynesians correct in different situations. Factors affecting this include whether firms are perfectly competitive, how the costs of firms respond to prices, and aggregate output. Though justified by mathematical models elsewhere, these results are illustrated with simple diagrams of marginal revenue equalling marginal cost.

Introduction

A major, if not the main, theme of disagreement between different economists, policymakers, and at times the lay public, is that of free markets versus government intervention. Should society leave economic matters to be decided by free market forces or should the government intervene in various areas to achieve improvements? Although some intervention is present in all economies, the extent, degree and methods of desired intervention are still subject to much debate. In this Special Feature, I will do two things quickly. First, I will outline my thoughts regarding this central issue in the area of microeconomics, drawing some main conclusions, and referring readers to my previous writings for further details.

Next, I will offer a way to bridge the micro and macroeconomic domains based on my earlier contributions to mesoeconomics (explained below). The focus is on why changes in nominal aggregate demand, including changes in money supply, may or may not affect aggregate output under various conditions. This perspective also partly explains why we have big differences between two major groups—the believers (including the Monetarists) in free markets, *laissez-faire* and/or rules, and those (including the Keynesians) that favour government discretion and intervention. I believe that both sides are differently correct in important aspects, but lack the full picture.

[1] Ng Yew-Kwang is a Professor of Economics at Nanyang Technological University, Singapore. The views in this article are solely those of the author and should not be attributed to MAS.

Insights From The First Theorem In Welfare Economics

In the area of microeconomics, the most important result in economics is, in my view, the first theorem in welfare economics. This theorem states that the general equilibrium of a market economy under perfect competition results in a most efficient allocation of resources, inputs, or factors of production, and of final goods (taken to include services), as exposited in Ng (2015). Conditions needed for the theorem to hold include the absence of external effects like pollution and serious ignorance that justifies things like food safety regulation. These conditions, as well as the requirement for perfect competition, are very strict and never fully satisfied in any real economy. Nevertheless, the theorem is important as it explains why the invisible hand of the market works (even if not perfectly) and it serves as a benchmark to guide us in locating areas that might need government intervention.

For example, where there is serious environmental disruption, efficiency may be seriously violated and government intervention, if not too inefficient, may help to mitigate the devastating effects. Pigovian taxes on pollution and greenhouse gas emissions may be needed. Although Nobel laureate Ronald Coase (1960) argued against Pigovian taxation, his argument is based on ignoring the asymmetry between the costs of reducing pollution/emission which are infinitesimal at the margin of free-pollution equilibrium, and the benefits of such reduction which are high (Ng, 2007). These (marginal) damages are difficult to estimate, making the amount of Pigovian taxes (which should ideally equal these damages) difficult to determine. However, for most cases where abatement investment to reduce environmental disruption is being undertaken, it can be shown that the Pigovian taxes should at least equal the marginal costs of this investment, which are much easier to estimate. Moreover, the amount of tax revenues so collected will be more than enough to fund the optimal amount of abatement investment (Ng, 2004).

The first welfare theorem specifies only efficiency; thus, another possible area of government intervention is to reduce poverty and inequality. However, unless justified by some efficiency considerations (such as external effects), equality should be pursued in terms of overall incomes, leaving specific issues to be determined by the principle of efficiency supremacy or "a dollar is a dollar irrespective of rich or poor", as argued in Ng (1984). If a good produces external benefits/costs, it may be subsidised/taxed on the efficiency grounds of its external effects. In the absence of such efficiency considerations, a good should not be taxed/subsidised for being predominantly consumed by the rich/poor, as taxing/subsidising their incomes directly is more efficient. Thus, while progressive and negative income taxation may be justified, inadequate pricing of petrol, electricity, and water cannot. In the presence of second- and third-best considerations (on which see Lipsey and Lancaster, 1956; Lipsey, 2017; Ng, 1977a; Ng, 2017), complications may arise. For example, it is best to tax the driving of cars heavily and the use of public transport such as buses, trains, and MRTs slightly, on environmental grounds. However, if it is not feasible (technically or politically) to tax private driving, it may be better to subsidise (instead of taxing) bus/train/MRT riding as this is a close substitute to driving.

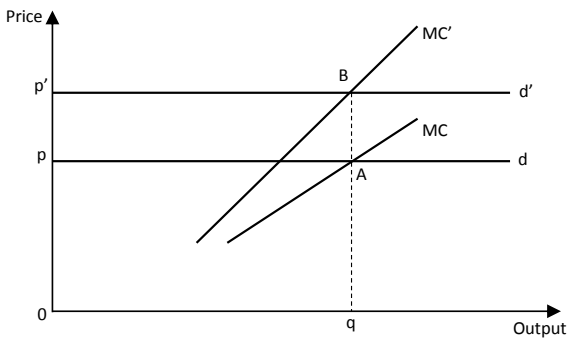
Of course, even in areas where the market fails and government intervention may be indicated, the results of intervention may yet be worse if it is too inefficient. Thus, we tell students the mistake of the Roman emperor who awarded the trophy to the second singer after just hearing the first singer. This consideration is less important in the case of Singapore, which has a good track record of efficient public policy formulation and implementation, and it is overwhelmed by the compelling importance of the issue of environmental disruption which may threaten human survival. We cannot just wait to die.

Does Money Affect Real Output Or Price Level? A Mesoeconomic Perspective

Friedman (1970) regarded the most important problem in macroeconomics to be how a change in nominal aggregate demand (as may be effected by a change in money supply or other factors) affects the price level or aggregate output. Economics students also learn that, ignoring time lags, money is neutral (i.e., affecting only the price level, not real variables). This important problem involves many aspects beyond the scope of this Feature. Here, I only shed some light on one important aspect using the method of mesoeconomic analysis I have developed over the last few decades (Ng, 1977b, 1980, 1982, 1986, 1992), with the latest perspective in Ng (2014). This is a general equilibrium analysis (but simplified to abstract away changes in relative prices and allow the use of the representative firm methodology) that takes into account the responses in both the cost side (effects of changes in aggregate output and the price level on the costs of the firm) and demand side (effects of changes in aggregate output, aggregate income/demand, and the price level on the demand for the firm's product), as well as the interaction of the firm with other firms as a whole group.[2]

For convenience, we may use the simplifying assumptions of no time lags and no money illusion or other frictions. Then, it can be shown that, if we assume in addition that firms are perfect competitors, we have the result of money neutrality, where nominal aggregate demand only affects prices, but not output or employment. This result is consistent with the fact that all models correctly producing neutrality are explicitly or implicitly based on perfect competition, as may be cross-checked.[3] The micro foundation of this neutrality is shown in Figure 1 for the short-run case, with a given number of firms. The aggregate output *Y* is then represented by the output of the representative firm on the horizontal axis. The initial equilibrium point *A* is at the intersection of the initial demand curve (horizontal due to perfect competition) for the output of the firm *d* with its marginal cost curve *MC*. A change (say an increase) in nominal aggregate demand shifts the demand curve upward to *d'*. As a higher price for the representative firm also means a higher average price or price level, the *MC* curve also shifts up by the same proportion, in the absence of time lags in adjustments in the input markets. The new intersection point of *d'* and *MC'* at *B* shows only an increase in price, with the output (hence employment) unchanged at the original point *q*. Money is then neutral.

Figure 1
Neutrality of Money under Perfect Competition



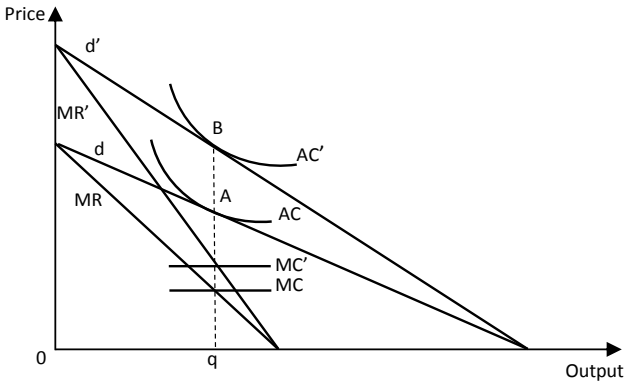
2 Strong methodological support for this analysis has been provided. Using a fully general equilibrium analysis, Ng (1986) shows: (i) the hypothetical existence of a representative firm whose changes in output and price accurately represent those of the whole economy in aggregate output and the average price for any given exogenous change; and (ii) the actual existence of a representative firm, defined by a simple weighted average of all (or a representative sample of) firms, whose changes in output and price approximately represent those of the whole economy for any exogenous change that does not result in drastic changes in relative prices.

3 The neutrality result even under imperfect competition is based on ignoring the possible existence of multiple equilibria, as shown in Ng (1998).

Now consider the case where firms need not be perfect competitors, but may be monopolistic competitors, monopolists, oligopolists, etc. While the complications with oligopoly are analysed in Ng (1986), here we just take the representative case of imperfect (or 'non-perfect' for generality) competition with each firm facing a downward-sloping demand curve. In this case, our mesoeconomic analysis shows that money may then be either neutral or non-neutral; money may still only affect just the price level, but it may also affect real variables.

The neutrality or the Monetarist case is illustrated in Figure 2. Here, an increase in nominal aggregate demand shifts the demand curve, the marginal revenue (*MR*) curve, and the cost curves (*MC* curve and *AC* or average cost curve) all vertically upward proportionately, causing the profit-maximisation equilibrium point to correspondingly shift vertically from *A* to *B*, with only an increase in price but not in output.[4]

Figure 2
Money may still be Neutral under Non-perfect Competition



However, other cases may be possible under non-perfect competition, including the contrasting Keynesian case where an increase in nominal aggregate demand increases output and employment without affecting the price level. This is illustrated in Figure 3 for the short run, and in Figure 4 for the long run. In Figure 3, an increase in nominal aggregate demand shifts the demand curve for the product of the representative firm from *d* to *d'*, becoming more price-elastic at *B* than at *A*. This is possible as the change from *A* to *B* involves a change in real output, which makes a different price elasticity possible.[5] In contrast, for the Monetarist case illustrated in Figure 2 above, the price elasticity of demand at *B* remains unchanged, being equal to that at *A*. This is because the change from *A* to *B* in that case involves no real changes, only a nominal price change.

The long-run case in Figure 4 involves a larger number of firms as nominal aggregate demand increases. There is then an additional reason for the price elasticity of demand to be higher at the new equilibrium point *B*. This is because the entry of new firms increases the degree of competition. The resulting higher price elasticity of demand allows the marginal cost of the representative firm to be higher due to the original *MC* curve being possibly upward-sloping or the whole *MC* curve shifting upward with aggregate output *Y*.[6]

4 Recall that under imperfect competition, the *MR* curve lies below the demand curve because placing an extra unit of the product on sale drives down the price slightly, so that the net revenue gained equals the extra revenue from that unit less the loss that occurs on all previous units due to the lower price.

5 The case of no change in this price elasticity is also possible for the Keynesian case but requires the *MC* curve to be non-upward-sloping and/or the whole *MC* curve not to shift upward with aggregate output *Y*; or with the two opposite effects offsetting each other.

6 The downward-sloping case is also possible and as noted in the previous footnote, even more favourable for the prevalence of the Keynesian case.

Figure 3
Money may be Non-neutral under Non-perfect Competition in the Short Run

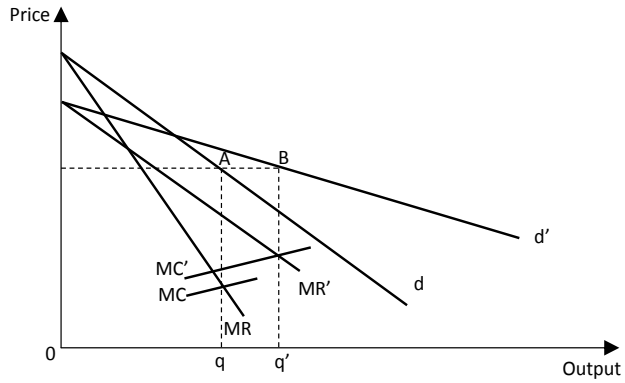
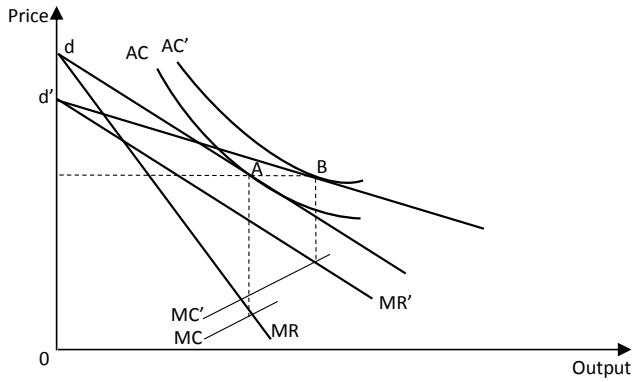


Figure 4
Non-neutrality of Money even in the Long Run



It may be suggested that we have just cherry-picked and drawn various demand and cost curves to make up the above cases, and that this might be inconsistent with economic analysis. However, all cases illustrated are consistent with the orthodox economic analysis of consumer utility maximisation (including the resulting homogeneity of degree zero in the demand functions) and the firm's profit maximisation, including the required shifts in their cost curves in response to aggregate variables (output and the price level), as shown in the full mathematical models for both the short and the long runs in Ng (1986, 2014). This fuller mathematical analysis shows that, apart from the contrasting cases of perfect versus non-perfect competition, other factors important in affecting whether the Monetarist or the Keynesian cases prevail include[7]:

- How the marginal cost of the firm responds to its own output, i.e., the slope of its *MC* curve. For small input price-taking firms, the slope of the *MC* curve depends on the relevant technology and existence of excess capacity. For larger firms, it may also depend on how input prices respond to an increase in output. An upward-sloping *MC* curve favours the Monetarist case; a horizontal or downward-sloping one favours the Keynesian case.

- How the cost curves (*MC* for the short run and *AC* for the long run) respond to the price level and aggregate output (the latter responses depend much on whether the economy is fully employed or has excess capacity). Full (proportionate) responses to prices and positive responses to output favour the Monetarist case; non-full and non-positive responses favour the Keynesian case.

[7] There are also other cases including the intermediate one, the 'expectations wonderland' where the outcome depends on expectations that will be self-fulfilling, and the cumulative expansion/contraction case, which may partly explain the Great Depression in 1929.

- Possible changes in the price elasticity of demand faced by the representative firm are also relevant, as discussed above. Elasticity is in turn exogenously determined by the demand for the product and the specific market situation. In general, an increase in the (absolute) demand elasticity as aggregate output increases favours the Keynesian case.
- Comparing the long and the short runs, costs are more likely to respond fully to prices and positively to output in the long run, and in this respect, makes the Monetarist case more likely. On the other hand, the possible entry of new firms with higher aggregate demand makes the Keynesian case more likely in the long run. Considering both factors, the net effect depends on particular cases.

The Crux Of The Difference

The reason we have the very contrasting results of money neutrality under perfect competition and possible non-neutrality under imperfect competition may be explained briefly. Under perfect competition, a firm faces a horizontal demand curve for its product. A horizontal demand curve can only shift upward or downward. It cannot shift leftward or rightward. A vertical shift in the demand curve for the representative firm implies a change in the price level which leads to corresponding vertical shifts in the cost curves in the absence of time lags, causing changes in prices only and with no output changes. On the other hand, with non-perfect competition, a downward-sloping demand curve may shift upward and downward, and it may also shift leftward and rightward, making both changes in prices only and changes in output only possible.

On the supply or cost side, a horizontal demand curve (hence also a horizontal *MR* curve) under perfect competition necessitates an upward-sloping *MC* curve for a determinate equilibrium. An upward-sloping *MC* curve means a higher marginal cost with higher output, leading to the requirement for a higher price (to be consistent with profit maximisation in the absence of other changes) and hence making the Keynesian case impossible. On the other hand, for the case of non-perfect competition, a downward-sloping demand curve usually implies an even steeper and downward-sloping *MR* curve. This makes upward/horizontal/downward-sloping *MC* curves all possible. The non-upward-sloping cases favour the Keynesian case as a higher output level need not entail a higher *MC*, unless the whole *MC* curve moves upward with the higher aggregate output. Whether the Keynesian case is possible or not depends on the combined effects of these various factors, as analysed precisely in the mathematical models, and illustrated graphically for specific cases above.

An Explanation Of The Contrasting Views Of Monetarists And Keynesians

The discussion above provides a partial explanation of the contrasting views of the Monetarists and the Keynesians on the effects of changes in nominal aggregate demand. This contrast not only applies to academic disputes but is also manifested in the very different policies adopted in the real world, including the debate over rules versus discretion in monetary policy and significant differences between some international organisations in their advice on handling financial crises.

For those who base their analysis on a well-functioning economy with perfect competition, they see that, ignoring short-run deviations due to such factors as time lags, the economy equilibrates to a unique efficient outcome largely by itself. The government only has to provide law and order, protection of property rights, essential public goods, and an announced rule in money supply. On the other hand, the Keynesians see the possibility of prolonged unemployment caused by

inadequate aggregate demand, and hence are in favour of using active fiscal and monetary policies to promote fuller employment when needed. Actual recent examples include the RMB4 trillion stimulus package China introduced in 2009 to deal with the imminent threat of collapse in aggregate demand, and the various rounds of quantitative easing by the US in the years following the 2008 financial crisis.

Our discussion above, including the first welfare theorem and the mesoeconomic perspective, suggests that both sides see some important elements in the real economy, but not all the relevant factors. Apart from the factors discussed above, there are many other factors discussed by economists, and likely many other factors that are yet to be explored. Economists are not born to lead an easy life!

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