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INTRODUCTION TO MACROECONOMIC DYNAMICS SPECIAL ISSUE: PUBLIC POLICY, EXTERNALITIES, AND ECONOMIC GROWTH

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1. INTRODUCTION

Externalities are a fundamental aspect of any modern interdependent economy. The fact that agents interact with one another makes it inevitable that their decisions will influence one another directly, in addition to any indirect impact that may occur through the market place. Ever since the earliest stages of the discipline, externalities have been of prime concern to economists, who have long argued that they provide an important motive for (economic) decision making. To cite one prominent example, in *The Theory of Moral Sentiments*, Adam Smith notes that "Though it is in order to supply the necessities and conveniences of the body that the advantages of external fortune are originally recommended to us, yet we cannot live long in the world without perceiving that the respect of our equals, our credit and rank in the society we live in, depend very much upon the degree in which we possess, or are supposed to possess those advantages. The desire of becoming the proper objects of this respect . . . is perhaps the strongest of all our desires" [Smith (1759, pp. 348–349)]. In modern terminology, Adam Smith is referring to a *consumption externality*.

First versions of most of the papers of this special issue of *Macroeconomic Dynamics* were presented at the European Science Foundations *Public Goods*, *Public Projects*, *and Externalities* Workshop (PGPPE), Graz, Austria, July 9–11, 2009, documentation of which can be found at http://www.uni-graz.at/ronald.wendner/PGPPE09/index.html. Financial support from both the European Science Foundation (SCSS: PGPPE program) and the Schumpeter Centre of the University of Graz, Austria is gratefully acknowledged. Financial support alone, however, would not have made possible the Graz PGPPE Workshop without the excellent support of all members of the steering and program committees. In particular, we thank Monique Florenzo, Richard Sturn, the discussants at the workshop, and all referees, who submitted excellent reports in response to both submissions for consideration of presentation at the Graz PGPPE Workshop and submissions for consideration of publication in this special issue of *Macroeconomic Dynamics*. Special thanks go to Johanna Pfeifer, whose help in organizing the PGPPE Workshop was invaluable.
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Many authors have elaborated further upon Smith's (1759) argument. Consumption externalities are at the heart of Veblen's (1899) *Theory of the Leisure Class* and were first formalized as a determinant of aggregate consumption by Duesenberry (1949) in his development of the "relative income hypothesis." More recently, they have been extensively studied in the context of models of jealousy and "keeping up with the Joneses," which analyze their implications for such issues as asset pricing, short-run macroeconomic stabilization, tax policy, the level of consumption, and more recently economic growth.

Production externalities also have a long history, dating back to Marshall (1890). In contrast to consumption externalities, production externalities provided the cornerstone of the endogenous growth model pioneered by Romer (1986) and the revival of growth theory that it spawned.[1] The key feature of this framework is that even though the individual firm's capital stock may be subject to diminishing marginal product, the presence of an aggregate production externality enhances its productivity so that in equilibrium the economy is able to sustain a steady endogenously determined growth rate.

Empirical evidence on the importance of externalities is sparse and indirect, but overall, the existing evidence provides convincing support for their importance. An early study by Easterlin (1973) demonstrated that money does not buy happiness. In particular, he showed that although income had substantially increased over the previous decades, this rise in income was not accompanied by a rise in (self-reported) happiness, suggesting the presence of a negative consumption externality. More recently, the quantitative effects of consumption externalities have been empirically assessed. Both survey-experimental analyses and studies based on econometric analyses of panel data on individuals' incomes and self-reported happiness demonstrate the significance of consumption externalities; see, e.g., Clark and Oswald (1996) and Frank (1997). Evidence on production externalities, although less conclusive, is nevertheless also quite compelling; see, e.g., Caballero and Lyons (1990).

In the light of the empirical evidence supporting the presence of externalities, the question of how they influence economic performance is important. To what extent do they introduce distortions into savings and investment decisions and the resulting growth performance? And what are the appropriate corrective policy responses? This special issue of *Macroeconomic Dynamics* presents a number of papers addressing these issues.

2. EXTERNALITIES, PUBLIC POLICY, AND GROWTH

All papers in this issue of *Macroeconomic Dynamics* relate to all three themes of this special issue: public policy, externalities, and economic growth, although the interactions between them are quite diverse. In any macrodynamic framework, externalities will almost always affect the growth rate(s), both along transitional paths and in steady-state (balanced-growth) equilibrium. Moreover, the presence of externalities will, in general, influence how any given public fiscal policy affects

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the equilibrium growth performance and welfare of the economy. Therefore, one focus of this special issue is the impact of externalities on the positive effects of *given* fiscal policies.

A second focus of this special issue is analyzing significant normative aspects of externalities. Once externalities are present, a competitive equilibrium, in general, does not yield an efficient allocation of resources. Optimal fiscal policies respond to externalities in the process of correcting for such "market failures." As several of the papers in this issue make clear, the analysis of normative aspects of externalities goes along with significant informational requirements. Those informational requirements present a major obstacle for designing optimal policies. For example, a country's level of public infrastructure is shown to affect the pure rate of time preference, which, in turn, affects the optimal level of public infrastructure investment. Empirical estimates of public investment's effect on the pure rate of time preference are scarce, at best. Unfortunately, this sensitivity is indispensable for evaluating and justifying public infrastructure investments.

A third focus of this special issue is heterogeneity. The canonical representative agent framework does not always capture key facts about economies well. Some papers demonstrate that taking into account the heterogeneity of agents leads to qualitative differences in the effects of fiscal policies from a more conventional framework with homogeneous agents.

3. THE PAPERS OF THIS SPECIAL ISSUE

This special issue comprises eight papers. Although some of the papers deal primarily with just one of the three issues we have noted, others have a broader focus. Several papers investigate the impact of externalities on the effects of *exogenou*s fiscal policies. The fiscal policies investigated typically include increases in the capital income tax, the labor income tax, and a consumption tax with lump-sum revenue rebating.

Heijdra and Mierau consider a production externality, where labor productivity depends positively on the aggregate capital stock. Using a continuous-time overlapping-generations framework, they consider three features: labor–leisure choice, age-dependent mortality rates, and imperfect annuity markets. This framework allows one to replicate key macroeconomic (stylized) facts, such as a hump-shaped consumption pattern over the life cycle. The endogenous (balanced) growth rate is generally affected by different policies. Whether or not a given fiscal policy increases the (balanced) growth rate depends on the "direction" of resource transfers induced by the fiscal policy. If the fiscal policy effectively transfers resources toward cohorts with a high (low) propensity to save, the endogenous growth rate rises (falls).

Wendner also considers a continuous-time overlapping-generations model with a production externality, where labor productivity depends positively on the aggregate capital stock. With an exogenous labor supply and constant mortality rates but gradual retirement, he demonstrates that the effects of a

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keeping-up-with-the-Joneses consumption externality depend on the rate of gradual retirement. For a low rate of retirement, the balanced growth propensity to consume out of total wealth rises, and the balanced growth rate declines. The opposite is true for a "high enough" retirement rate. He also addresses optimal allocation and demonstrates that a high rate of gradual retirement necessitates a pay-as-you-go transfer system. If the rate of gradual retirement is low, however, optimality is obtained by imposing a reverse pay-as-you-go transfer system. A keeping-up-with-the-Joneses consumption externality amplifies the regressivity (progressivity) of the optimal transfer system.

Koyuncu and Turnovsky analyze several fiscal policies in an infinitely lived heterogeneous agent model, where the source of heterogeneity is differential initial endowments. Investment gives rise to a positive production externality, as in the papers described above. In addition, agents exhibit a *catching*-up-with-the-Joneses consumption externality.[2] With infinitely lived agents, important fiscal policies that have no effects under *keeping*-up-with-the-Joneses preferences affect both transitional and balanced growth paths under *catching*-up-with-the-Joneses preferences. Moreover, the paper shows that the consumption externality alters transitional paths substantially. With a catching-up-with-the-Joneses externality, inequality evolves over time, and (second-best) fiscal policy changes income inequality by more than it does in the case of conventional preferences without consumption externalities. In contrast to time-separable preferences, a capital (labor) income tax reduces (increases) wealth inequality.

In contrast to these three papers, Fisher employs a small open-economy framework to investigate the effects of a *wealth* externality on endogenous growth, where households derive utility from an above-average level of wealth. He shows how the endogenous growth rate is permanently increased (decreased) by a rise in the tax on international bonds (on capital income).

Dioikitopoulos and Kalyvitis consider the growth-maximizing level of public infrastructure investment. Public spending imposes two externalities. It affects the pure rate of time preference, and it raises the return of private factors of production. For an endogenous rate of time preference, the growth-maximizing ratio of government spending to the GDP exceeds the elasticity of output with respect to public capital. If the impact of public spending on the rate of time preference is significant enough, this higher share of public spending is financed by a lower tax rate, as the decline in the rate of time preference induces more growth and thereby raises the tax base.

Public infrastructure investment also provides a positive production externality across countries, as argued by Hashimzade and Myles. As a consequence, individual countries underprovide public infrastructure. For financing public infrastructure, individual countries choose the growth-maximizing tax rate, which, however, is lower than the welfare-maximizing rate. Capital mobility creates an additional externality, made worse by international tax competition. This provides a role for a supranational body to coordinate public policy.

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Rezai's paper relates climate change induced by economic growth to optimal fiscal policy. The dynamic integrated model of climate and the economy (DICE) simulation model is modified in two ways. The recast DICE model allows for nonzero mitigation of greenhouse gases from the beginning of the simulation period (whereas the DICE model assumes zero mitigation over the first 25 decades), and it introduces "plausible" upper limits on the atmospheric concentration of carbon dioxide. The recast DICE model shows that the original model's policy prescription, according to which it is optimal to backload mitigation, is not robust with respect to the introduced modifications. In contrast, early mitigation is shown to yield a Pareto improvement.

The Creedy, Li, and Moslehi paper relates to both normative aspects and heterogeneity. In an overlapping-generations framework, the authors consider the impact of inequality on the optimal mix of public good expenditure and redistributive transfer payments. Both greater income inequality and a greater social preference for inequality aversion give rise to a larger optimal ratio of (redistributive) transfer payments to public good expenses. The model is then used to infer inequality aversion for a range of countries. The results accord well with previous empirical cross-sectional assessments of inequality aversion.

4. LOOKING AHEAD

The papers in this special issue of *Macroeconomic Dynamics* demonstrate that connecting public policy with externalities is a significant undertaking. As externalities affect both balanced growth paths and transitional paths, ignoring externalities may yield large welfare losses. Two important channels for future research suggest themselves.

First, a large prior literature takes consumption externalities into account in economic analyses. This literature, however, fails to consider key aspects of the findings of behavioral economics. In many cases, consumption externalities are formulated in a way inconsistent with experimental research. For example, Fehr and Schmidt (1999) demonstrate that people dislike inequality (especially when their income falls short of some reference level), and people like being ahead of others. These findings represent *different* aspects of consumption externalities, and they are most likely not symmetric.

Second, empirical estimates of key parameters determining externalities are scarce and unreliable. However, both positive and normative policy analyses are sensitive with respect to specific externality-related parameters, as is demonstrated in the papers of this special issue. Obtaining a more reliable range of empirical estimates for externality-related parameters is therefore a high research priority.

NOTES

1. Actually, the type of externality proposed by Romer can be found in an early formulation by Frankel (1962).

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2. "Catching up with the Joneses" refers to a situation in which a household's utility is affected not only by a present level of reference consumption but also by *past* levels of reference consumption.

REFERENCES

Caballero, R.J. and R.K. Lyons (1990) Internal versus external economies in European industry. *European Economic Review* 34, 805–830.

Clark, A.E. and A.J. Oswald (1996) Satisfaction and comparison income. *Journal of Public Economics* 61, 359–381.

Duesenberry, J.S. (1949) *Income, Saving, and the Theory of Consumer Behavior*. Cambridge, MA: Harvard University Press.

Easterlin, R.A. (1973) Does money buy happiness? *The Public Interest* 30, 3–10.

Fehr, E. and K.M. Schmidt (1999) A theory of fairness, competition, and cooperation. *Quarterly Journal of Economics* 114, 817–868.

Frank, R. (1997) Happiness and economic performance. *Economic Journal* 107, 1815–1831.

Frankel, M. (1962) The production function in allocation and growth: A synthesis. *American Economic Review* 52, 995–1022.

Marshall, A. (1890) *Principles of Economics*. London: Macmillan.

Romer, P.M. (1986) Increasing return and long run growth. *Journal of Political Economy* 94, 1002–1037.

Smith, A. (1759) *The Theory of Moral Sentiments.* Oxford, UK: Clarendon Press.

Veblen, T.B. (1899) *The Theory of the Leisure Class: An Economic Study of Institutions.* New York: Modern Library.

https://doi.org/10.1017/S1365100510000362 Published online by Cambridge University Press