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FACTOR MOBILITY AND FISCAL POLICY IN THE EU: POLICY ISSUES AND ANALYTICAL APPROACHES

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Abstract

Increased integration of labour and capital markets creates significant challenges for the welfare states of modern Europe. Taxation of capital and labour that finances extensive programs of cash and in-kind redistribution creates incentives for capital owners and workers to locate in regions where they obtain favorable fiscal treatment. Competition among countries for mobile resources constrains their ability to alter the distribution of income and may lead to reductions in the size and scope of redistributive policies. Mobility of labour and capital is imperfect, however. Recent trends indicate that labour and capital are neither perfectly mobile nor perfectly immobile, but rather adjust gradually to market conditions and economic policies. This paper presents an explicitly dynamic analysis showing that governments can achieve some redistribution when it is costly for factors of production to relocate. As the costs of factor mobility fall, however, the effectiveness of redistributive policies is more limited, and governments have weaker incentives to pursue them. Liberalised immigration policies, EU enlargement, and other steps that promote integration of the factors markets of Western Europe with those of surrounding regions thus present a challenge to policymakers if they also wish to maintain fiscal systems with extensive redistribution.

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1 Introduction

The past century has seen dramatic growth in the role of the public sector in the countries of Western Europe, both by extensive regulatory as well as fiscal interventions. In the fiscal sphere, the EU countries in recent decades have maintained public expenditures and revenues at about 40% of GDP (see Table 1). These expenditures partly finance the provision of classic public goods like national defense and this century has seen episodes – hopefully not to be repeated in the next – where a large share of public-sector spending has been devoted to defense and national security generally. But by far the most important reason for the growth of public spending has been the increase in the level of redistributive (or social insurance) activities of governments. These include public pension systems and health care programs whose benefits largely accrue to the old and that entail substantial intergenerational as well as intragenerational transfers. They also involve a host of other transfers: from the employed to the unemployed, toward the less-skilled, toward students, toward families with children, toward farmers, toward workers in specific industrial sectors such as shipbuilding or coal-mining, toward people or businesses in poor regions, and many others.

On the tax side, public expenditures have been financed by consumption taxes, payroll taxes, taxes on personal income, and taxes on business income, as shown in Table 2. This structure of taxation in European countries implies that the burden of public expenditures, broadly speaking, falls more heavily on households with higher levels of consumption, income, and wealth. But of course the tax systems of Western Europe also fall unevenly on different types of households and businesses because of explicit and implicit distinctions between different types of income, consumption, and wealth and because of uneven levels of enforcement, administration, and evasion. All of these features of the revenue system of Western Europe themselves entail intentional or accidental redistribution of income, as well.

No simple generalization can accurately characterize such a vast system of public-sector policies. But it is fair to say that they reflect the outcome of a democratic policy making process that has not been prepared to accept the market-determined distribution of income in an unaltered form. The market-determined distribution of income, of course, reflects essentially the distribution of endowments and factor prices, and, even in a static world, would exhibit inequality attributable to differences in ability, health, and other personal characteristics. Of course, the world and the distributed income are not static. The distribution of wealth, though fixed at any one moment, evolves over time as a result of household consumption, saving, and bequest behavior, and the distribution of income also evolves accordingly. Moreover, factor prices change continually – and often somewhat unexpectedly – due to technological change, demographic change, changes in demand, and associated changes in domestic and world product prices. Just to provide one illustration, returns to labor and capital in the agricultural sector in North America and Western Europe have failed to keep pace with returns elsewhere in the economy, leading to a

century-long decline in the share of labor and capital allocated to this sector. This long-term shift can obviously be attributed in large part to technological change and also to world demographic shifts. It is noteworthy that this long-term shift has been accompanied by fiscal and regulatory policy efforts both in North America and in Europe that have had the effect of protecting the returns to resources in the agricultural sector. In addition to distributional consequences, of course, these policies, like many redistribution policies, have also interfered with efficient resource allocation by dulling the incentives for scarce resources to flow from less-productive to more-productive uses.

Changes in economic policy that directly or indirectly affect factor markets and factor prices obviously affect the distribution of income, sometimes in intended directions and sometimes not. The process of European economic integration – part but not all of which is the result of explicit steps toward liberalization of markets undertaken under the auspices of the EU – is bound to have important effects on factor markets and the distribution of income. In particular, integration of factor markets themselves affects factor prices directly. In addition, factor mobility affects the fiscal systems of countries that experience increases or decreases in population and labor forces and in the stock of capital.

This paper attempts to outline some of the implications of factor market integration for fiscal policy in the countries of the EU and for the EU itself. It draws particular attention to the dynamic dimensions of factor market integration, and identifies some of the many issues for further research on these topics.

The paper begins, in Section 2, with a concise recapitulation of some principles that have emerged from existing literature on fiscal competition. For the most part, this literature has tended to rely on somewhat stylized analytical frameworks built on polar assumptions about factor mobility. This analytical approach exposes fundamental issues in a transparent fashion, but strong simplifying assumptions can also be misleading. Section 3 describes recent trends in international migration and capital movements. The evidence suggests that the countries of Europe are experiencing inter-regional movements of labor and capital of significant magnitude, but that these movements are far from instantaneous. Labor and capital are clearly linked across regions, but there appear to be obstacles to very rapid adjustments of labor and capital stocks, suggesting that labor and capital are mobile but imperfectly so.

In view of the evidence on labor and capital mobility, analyses of factor mobility with explicit dynamics offer promise. Section 4 therefore develops a new approach to the analysis of fiscal competition. It shows how "stock adjustment" models of labor and capital mobility can be utilized to investigate the distributional and allocative effects of fiscal policy in a world where factors of production are only imperfectly mobile, and where the response of labor and capital to fiscal policy takes place gradually over time. Section 5 concludes with a discussion of some of the important policy issues that EU countries seem likely to face during coming decades.

2 Redistributive Policy with Factor Mobility: Atemporal Models

Most of the economic analysis of fiscal competition has focused on polar cases in which factors of production are assumed either to be completely immobile or costlessly mobile. Even though analyses based on stylized assumptions can be criticized for lack of realism, the study of polar cases is nevertheless quite helpful in obtaining clear insights into complex issues, providing important benchmarks and reference points.

2.1 The "Canonical" Model: The Fiscal Implications of Capital Mobility

The simplest way to begin the exploration of the implications of factor market integration is to suppose that a previously-immobile factor of production becomes costlessly mobile among a large number of small jurisdictions. The assumption of "small open" jurisdictions means that the factor of production is available to each jurisdiction at an externally-fixed net rate of return. As examples, one might imagine that a small locality within a large country, such as a single local school district within the United States or a single small town in Germany, suddenly faces an infinitely-elastic supply of capital.[1]

If capital were perfectly immobile, a local source-based local capital tax, such as a property tax or a corporation income tax, would reduce the net rate of return to capital by the amount of the tax. This can be illustrated in Figure 1, where the curve VMP_K shows the rate of return to capital in a given locality. This curve is downward-sloping because of diminishing returns to capital in the presence of other factors of production (such as labor, natural resources, and public infrastructure) which are treated as fixed in supply, at least over the time horizon of the analysis. Thus, if the local stock of capital is fixed at K_0, the competitive rate of return on capital in the absence of taxation is given by r_0. The imposition of a tax of t_K per unit of capital reduces the net rate of return to $VMP_K - t_K$, resulting in a new equilibrium rate of return equal to $r_0 - t_K$. In this situation, the local government collects revenue equal to $t_K K_0$ (the rectangular area $r_0 ce (r_0 - t_K$ in the figure) which could be used to finance cash or in-kind transfers to the owners of other factors of production or to provide public goods and services. The entire burden of this tax would fall on the owners of capital in the locality. Note that for non-human resources such as capital, the owners of the resource need not be residents of the jurisdiction where their resources are located; thus, a portion of the burden of the tax may fall in part on non-residents of the locality, to a degree that depends on the share of the tax resource owned by "foreigners."

By contrast, when capital is costlessly mobile, local taxes cannot significantly reduce the net return to capital within the locality: capital owners will not suffer reduced returns in one locality when they can move their capital elsewhere and earn a higher net return. In the locality depicted in Figure 1, for example,

suppose that the rate of return on capital in external markets is r_0. Then the imposition of a tax at rate t_K must drive $K_0 - K'$ units of capital from the locality, until capital is sufficiently scarce in relation to other factors of production in the local market that its before-tax rate of return rises to $r_0 + t_K$, enabling owners of capital located there to earn the same net rate of return as elsewhere.[2]

It is sometimes argued that governments cannot raise revenues from the taxation of highly mobile resources because those resources flee the taxing jurisdiction. This would indeed be true if the local demand for the taxed resource is perfectly elastic. However, as Figure 1 shows, it remains quite feasible for a locality to impose a tax on perfectly mobile capital, and to use the revenue to finance public goods and services or cash transfers that benefit its residents, provided that the demand for capital is less than perfectly elastic. However, whereas this policy would make the beneficiaries of local public services better off at the expense of the owners of local capital if capital were fixed in supply, this is no longer the case when capital can adjust freely. Rather, the outflow of capital from the locality induced by the tax must reduce the before-tax income of other local resources (natural resources, immobile labor), and because the local capital tax distorts the allocation of capital – in equilibrium, it will now be more productive in this locality than its opportunity cost to the locality, i.e., than the external net rate of return – the loss of income to local workers will exceed the value of the tax revenue collected from capital taxation. This is illustrated in Figure 1 by the fact that the revenue rectangle $(r_0 + t_K)abr_0$ is smaller than the trapezoid $(r_0 + t_K)acr_0$ that represents the reduction in income accruing to local factors of production other than capital. Except to the degree that public expenditures have a greater value to local residents than the tax revenue used to finance them, this policy ends up lowering the welfare of local residents. The pecuniary value of this loss is the area of the triangle abc in Figure 1. Note that the residents of a locality inflict a net loss on themselves by taxing freely mobile capital even if *all* of the taxed capital is owned by nonresidents. In brief, a small open locality can engage in redistributive policies in which it imposes fiscal burdens on a mobile factor of production, but its incentive to do so is limited or completely negated by the harm that this does to local residents. This is in striking contrast to the effect of the same policy when the taxed factor of production is completely immobile.

If a source-based tax on mobile capital is harmful to local residents, might a source-based subsidy be beneficial to them? Suppose, in Figure 1, that a subsidy of t_K per unit is provided to capital employed in the locality, and that capital is freely mobile. If the external rate of return on capital is still r_0, the effect of the subsidy is to attract $K'' - K_0$ units of capital, resulting in an increase in output and an increase in the return to local immobile resources equal to the trapezoidal area $r_0cf(r_0 - t_K)$. This trapezoid would represent higher wages for local workers, higher rents accruing to the owners of local land or housing (assuming the housing stock to be fixed), or higher returns to any other immobile local resources. However, the cost of the subsidy – which must be financed by taxes on these immobile resources – is equal to $t_K K''$, that is,

the rectangular area $r_0 df(r_0 - t_K)$, and exceeds the increase in the before-tax returns to the immobile resources by an amount equal to cdf. That is, a *subsidy* to mobile capital *also* inflicts net harm on the residents of the local jurisdiction. From their viewpoint, then, the best policy must be one that imposed a zero net burden on mobile capital, resulting in an equilibrium capital stock of K_0.

2.2 More General Models of Fiscal Competition

While the standard model of taxes and subsidies for mobile capital is very simple, the major insights derived from it remain valid under more realistic conditions. For example, it is not at all crucial that *all* capital invested within the locality be freely mobile, only that enough capital be mobile *at the margin* that local tax policy is unable to depress the net return to capital. In Figure 1, for example, the analysis of the effects of a tax on capital is completely unchanged provided that no more than K' units of the local capital stock are immobile.

The analysis can also be extended to the case where there are many factors of production, some of are mobile and some of which are immobile. Suppose, for example, that the local economy uses two types of labor, skilled and unskilled, in addition to capital. In addition to the source-based income tax on capital, suppose that skilled labor employed within the local economy is also subject to taxation, for example through a personal income tax. Suppose that these taxes are used to finance spending that benefits local unskilled workers. If capital and high-skilled labor are initially immobile, these fiscal policies will redistribute income from capital owners and from skilled workers toward the unskilled. But if both capital and skilled labor are mobile, these policies would now have the effect of reducing the amount of the mobile resources used within the local economy. Just as in the case where only capital is mobile, these redistributive policies would now harm rather than help the owners of the immobile resources – in this case, the unskilled.

The same fundamental conclusion holds if there are several types of mobile capital and several types of mobile labor. As shown in Section 3's discussion of international investment and migration, many countries experience simultaneous outflows and inflows of both capital and labor, resulting in net capital flows and net migration that are far smaller than the gross outward and inward flows. Simultaneous inflows and outflows of capital and labor likely indicate that "capital" and "labor" are not actually homogeneous factors of production, but rather aggregates of many specific types of inputs. From the viewpoint of understanding the fiscal implications of factor mobility, it is the degree of exposure to external markets, and the way in which this constrains the ability of a local government to use fiscal policy to alter net factor returns, that is of critical importance.

To vary the model still one more time, suppose that source-based taxes on capital are used to finance expenditures that benefit *skilled* workers, for example through state-subsidized higher education or perhaps through subsidies to firms in high-technology sectors of the economy, and that unskilled workers neither pay taxes nor receive benefits from public expenditures. If capital and skilled

labor are both immobile, then the postulated tax and expenditure policies have the effect of redistributing income from capital owners to skilled workers. But suppose, instead, that both capital and skilled labor are freely mobile factors of production whose net returns are fixed in the external market. These policies now result neither in a lower nor higher return for capital or skilled labor than could be earned elsewhere, that is, there is no longer any net redistribution from the owners of taxed capital to the subsidized skilled workers. They do, however, affect the allocation of resources: the tax on capital will drive some capital out of the local economy, while the subsidy to skilled labor will attract some skilled workers. On balance, total output in the local economy might go up or go down as a result of this fiscal policy, but, on balance, it will necessarily harm the one group – the immobile, unskilled workers – that are neither taxed nor subsidized. In effect, a policy of taxing some mobile resources in order to subsidize others amounts to a combination of the two policies previously illustrated in Figure 1. As we have seen, each taken separately is harmful to local residents; so they are as well when combined (Wildasin, 1992). Whereas unskilled workers were "innocent bystanders" who were completely unaffected by the locality's redistributive policy when both capital and skilled labor were immobile, they are now left "holding the bag," suffering reductions in net income from redistributive policies in which they themselves do not directly participate either as contributors or as beneficiaries.

As Table 2 makes clear, the tax systems of modern European economies rely on many different types of taxes. The expenditure sides of their fiscal systems are no less complex. In order to understand correctly the policy implications of simple models like the one just outlined, it is important to note that fiscal variables like t_K should be interpreted to incorporate the *net* impact of all taxes and benefits that are borne by or that accrue to capital and skilled labor, respectively, contingent on their location within the locality. Thus, for example, a net subsidy to skilled labor would include the effects of all cash and in-kind transfers that benefit skilled workers *net* of local income taxes, local payroll taxes (whether assessed against highly-skilled workers or their employers), and local consumption taxes (taxes on retail sales or value-added, local excises). As we have seen, *source-based* local taxes on capital or capital income affect the incentive to invest in the local economy. But *residence-based* local taxes on capital income – for instance, personal income taxes on dividends, interest, and capital gains – would affect the net income of workers, especially higher-income skilled workers, and thus would affect the incentive for workers to reside in a given locality. It is thus interesting to note that residence-based taxation of *capital* income can distort the spatial allocation of *labor*; moreover, it is the *average* rather than the marginal tax rate on capital income that affects household locational incentives.[3] On the *expenditure* side of local fiscal policy – cash transfers and subsidies plus the monetized value of local public goods and services – the benefits that accrue to capital and to skilled labor enter *negatively* into their respective net fiscal burdens.

Tax and expenditure policies that achieve net fiscal transfers in favor of unskilled workers when capital and highly-skilled labor are immobile harm them

when these factors are mobile. On the basis of this analysis, then, one might expect that an increase in the mobility of capital and highly-skilled labor would lead to some restructuring of local fiscal policy in ways that would move net fiscal burdens on these factors of production – variables like t_K in the above analysis – closer to zero. Reforms of the revenue system, such as reductions in the progressivity of the personal income tax, reductions in corporation income tax rates, or increased reliance on user fees and charges could be part of this restructuring. Privatization of public enterprises removes the expenditures and revenues of these activities from the public-sector accounts, implying a reduction in redistributive transfers through regulated prices that embody cross-subsidization among consumers and through net fiscal transfers to loss-making enterprises. On the expenditure side, reductions in means-tested cash and in-kind transfers, increases in the provision of infrastructure that enhances the return to private capital, and increases in public services valued by highly-skilled workers would also reduce the effective fiscal burdens on mobile resources. Note that the analysis certainly does not suggest that all fiscal adjustment occurs solely on the tax side of the public-sector accounts; thus it is more appropriate to characterize fiscal adjustment to factor mobility as *fiscal* competition rather than as *tax* competition.[4]

2.3 The Political Economy of Redistribution: Exit and Voice

In a world where several different resources are immobile, the coercive power of the public sector can be exploited, through the political process, to transfer rents among the owners of these resources – for examples, from owners of land in the western part of a locality to landowners in the eastern part, or from immobile rich workers to immobile poor workers. Each of these groups has an incentive to participate in the political process to exploit the other, and to defend itself against exploitation by the other. In the language of Hirschman (1970), each has an incentive to use "voice."

But suppose now that a resource, previously immobile, becomes freely mobile. It is no longer in the interest of others in the jurisdiction to target this resource as a contributor in some redistributive mechanism, since it no longer earns rents that can be captured through fiscal policy. By the same token, the owners of the now-mobile resource no longer have an incentive to participate in the local political process since, on the one hand, the benefits of any fiscal transfers directed toward them would be eroded by inflows of competing resources, and, on the other hand, the burden of any transfers directed against them can be avoided by leaving – Hirschman's "exit" option.

Thus, even as the "voices" arguing for more favorable fiscal treatment of increasingly mobile resources (such as capital or highly-skilled young workers) become less insistent, fiscal policy may become more and more favorable toward them. The analysis of fiscal policy with increased factor mobility suggests that the locus of political debate would likely shift toward disputes among those resources that remain relatively immobile – "landowners in the east" and

"landowners in the west", owners of natural resources and the elderly, and others whose incomes are directly or indirectly tied to locationally-fixed resources. It is perhaps one of the paradoxes of increasing factor mobility that as political power becomes increasingly concentrated in the hands of immobile factor owners, the value of exercising that power tends to diminish.

In summary, the consideration of simple models of fiscal competition, based on extreme polar assumptions, shows that integration of factor markets – represented in most of the literature by the free mobility of previously-immobile factors of production – can have significant implications for redistributive fiscal policies. By opening up locational choice as a new margin of behavioral response, factor market integration can dramatically change the distributional effects of fiscal policy. In addition, increased factor mobility implies that fiscal policies entail new types of allocative inefficiencies. This is of critical importance not only for normative policy evaluation, but for understanding the political economy of fiscal policy.

3 Factor Mobility: Some Recent International Trends

While simple models based on polar assumptions offer great analytical advantages, they may also be misleading. In the context of European integration, it is difficult to justify *a priori* characterizations of capital and labor mobility in terms of extreme polar assumptions. With respect to labor mobility, language and cultural barriers are obviously important impediments to movement among some countries; by the same token, it is obvious that these impediments are not prohibitively high. The movement of financial capital among financial centers now entails only minimal intrinsic costs, but there remain important regulatory barriers to integration of financial markets. Furthermore, foreign direct investment, the relocation of business enterprise, and the establishment of productive capacity in new locations is neither costless nor prohibitively costly.

A look at recent trends may be useful, taking the US case as a benchmark for comparison with European countries. To begin with, consider capital mobility. Gross flows of financial capital are of immense magnitude; many of these flows represent offsetting movements through which financial and other institutions achieve portfolio diversification and protection against exchange rate and other financial risks. (In 1998, net financial investment from abroad was approximately 6% of GDP; the comparable figure for 1991 was only 1.5% of GDP (Board of Governors of the Federal Reserve System, 1999).) Net foreign investment flows are substantially smaller than gross financial flows, and foreign direct investment is smaller still, but they are growing over time. de Ménil (1999) analyzes the growth of FDI in relation to total capital formation, noting that whereas inward gross FDI accounted for only .9% of total investment in EU countries in 1984, it rose to over 6% in 1989 and 1990 before dropping back to 4.4% in 1994. For particular countries, FDI plays a more substantial role,

especially when outward as well as inward FDI is taken into account. Table 3 illustrates the trends in FDI outflows and inflows for selected European countries and for the US since 1970, showing that there has generally been an increase in gross FDI flows over time. For example, as a simple measure of total FDI openness, the *sum* of outward and inward FDI as a share of total 1997 investment exceeded 20% for 10 of the 14 European countries shown in the Table, amounting to more than 30% for 6 of them; by comparison, of the 12 European countries for which comparable data are available for 1975, the corresponding figure was less than 10% for all but the UK and the Netherlands which, at barely 20%, reported the highest figure for that year.

The importance of FDI also varies by sector. For instance, comparatively little FDI would show up in the residential housing sector in a typical economy, whereas manufacturing and financial services might be far more multinational in character. Table 4 shows that multinationals have played a large role in the manufacturing sector in recent years: foreign affiliates in the manufacturing sector of European countries account for 20–35% of manufacturing value-added, total earnings in manufacturing, and capital investment in manufacturing. The data in Table 4 are too limited to draw firm conclusions about trends, but such data as is available suggests that the role of multinationals in European manufacturing is rising over time. years.

Overall, these figures suggest that FDI seems to be at least as important in the EU countries as for the US. Both in the US nor in Europe, *net* flows of FDI are far smaller than *gross* flows. Neither in Europe nor in the US does FDI account for a major share of total investment, but its impact in particular sectors, such as manufacturing, is very substantial.

Turning now to labor mobility, it is important to recognize at the outset that international comparisons are somewhat difficult because of different systems for defining and measuring migration. Nevertheless, broad characterizations of migration trends and impacts are possible. (The statistics reported below are official OECD data (OECD, 1998a, 1999c). Measurement of illegal immigration is obviously highly problematic, but is conjectured to be quite important both in the US and in the EU countries. See Chiswick (1988) for discussion of illegal immigration and immigration policy.) Table 5 provides annual data on the stock of foreign population for many European countries and on the proportion of foreigners who acquire nationality each year. Observe that foreigners made up 5% or more of the total population in Austria, Belgium, Germany, Luxembourg, Sweden, and Switzerland in 1997; the same would be true for France. Foreigners make up less than 2% of the total population in the Czech Republic, Finland, Hungary, Italy, Portugal, and Spain. In most European countries, the percentage of foreigners has risen during the period 1988–1997. Note also that a portion of the foreign population acquires nationality in each country every year – usually from 1–3% of the foreign population, though the fraction has approached or even exceeded 10% in some cases, notably the Netherlands, Norway, and Sweden. Presuming that those who acquire nationality are likely to remain in the country for some years to follow, it is clear that the fraction of foreign population in these countries may understate the importance of immigrants.[5]

Especially after allowing for errors due illegal immigration, it seems clear that immigrant populations in many of the more affluent EU countries are quite high. For the less affluent countries of Europe, unsurprisingly, the converse is true.

For the US, annual inflows of immigrants have varied in the range .6–1.8 million in the past decade; for Germany, the EU country that has experienced the highest levels of immigration in recent years, gross annual inflows have fluctuated in the range .6–1.2 million during the same period, with net immigration of .1–.6 million. It is striking that Germany, with a population only one-third of that of the US, has experienced absolute levels of immigration not much below those for the US. Data on population outflows are not available for many countries, but, where data are available, they indicate that *gross* inflows into EU countries substantially exceed *net* inflows; for example, net inflows in 1995, expressed as a proportion of gross inflows, amounted to 28% for Germany 37% for Belgium, 67% for the Netherlands, and 57% for Sweden. Figures for migration among major census regions of the US show, similarly, that gross migration flows among regions greatly exceed the amount of net migration. Within the EU countries, a substantial minority of the foreign population is drawn from other EU countries (a share of one-third is perhaps representative), but the majority of foreigners are from non-EU countries.

As is well known, fertility rates and rates of population growth have fallen substantially in the postwar period both in the US and in the EU countries. Rates of natural increase have also declined and in some cases – notably Germany and Italy – have actually turned negative. In the US, natural increase still accounts for most population growth, but, for the past decade, immigration has been larger than natural increase as a source of population growth in the EU countries as a whole. This is indicative of a high level of net migration to the EU which originates predominantly in less-affluent regions such as Eastern Europe, the countries of the former Soviet Union, Turkey, and other less-developed regions of the world. It is fair to say, then, that migration, particularly from poorer regions of the world, has become a major determinant of population and labor-force trends both in North America and in the EU countries, but especially so for the latter.

In assessing the degree of integration in European markets for labor and capital, it is important to note that flows of labor and capital are indications of a process of adjustment to equilibrium. While such flows obviously cannot occur if factor mobility is prohibited, or prohibitively costly, the absence of such flows should not be taken to mean that they could not occur if desired. The key question is whether differentials factor returns can persist – specifically, in the present context, factor returns net of tax and net of the benefits of public expenditures – and if so, how large they can be and for how long they can persist. As de Ménil (1999) has emphasized, there do appear to be significant differences in rates of return to capital within EU countries. It is certainly also the case that there are significant differences in the gross returns to labor within EU countries (as indeed is also true not only among but within countries). On the other hand, Table 5 indicates that migrants are especially attracted to higher-income European countries, and, as noted, they are drawn to EU countries

particularly from relatively poor countries. These basic trends reveal a tendency for resources to flow from areas where their returns are low to areas where their returns are high.

This review of recent trends in labor and capital movements in Europe indicates that factor markets are becoming increasingly integrated, but it is clear that this process is far from instantaneous. If labor and capital were perfectly mobile, even very small interregional and international differences in the returns to labor and capital would trigger very high rates of factor movements for very short periods of time, causing rates of return to be brought back to equality very quickly. While innovations in information technology now make it possible for arbitrageurs to eliminate even modest differences in the rates of return for very liquid financial assets, the equilibration of returns among regions can take quite a long period of time for most factors of production. For example, economic historians (see Hatton and Williamson (1994) and references therein) have examined the movement of labor and capital from the "Old World" to the "New World" in the last half of the 1800s and in the early 20th century. Broadly speaking, these studies indicate that the net flows of labor and capital from Europe to America succeeded in obtaining higher rates of return, as standard theory suggests. Moreover, they also find that the factor returns gradually adjusted over time: differentials in wages and the returns to capital between Europe and America narrowed, the returns to immobile resources like land in Europe fell, and the returns to similar resources in America rose. This process of adjustment took decades, however, and indeed in some respects continues even now.

What can explain the protracted nature of this adjustment process, not only in the specific historical context of migration and capital flows between Europe and America, but more generally? Essentially there are two reasons why factor mobility does not instantaneously equilibrate net factor returns. First, there are what one might call the "intrinsic" impediments to factor movement, attributable to transportation, information, and other costs that prevent factor owners – the workers and the owners of capital – from obtaining the highest possible net return at every moment in time. Aside from the pecuniary costs of mobility, factor owners often must overcome language and cultural barriers in new locations and learn how to function in new legal and commercial environments. These barriers make the movement of labor and capital more costly and more risky and prevent the complete equalization of factor prices. Over time, many of these barriers are diminishing, as communication and transportation systems improve, and as information about economic conditions in different regions becomes more widely available. These costs are far lower now than was true 50, 100, or 500 years ago. But they are not zero.

Second, there are policy barriers to factor movements. These barriers take many forms, both explicit and implicit. In recent European experience, the most dramatic reductions in policy barriers to factor mobility have resulted from the end of the Cold War, the collapse of the former Soviet Union, the dissolution of the former DDR, and related events. On a less dramatic scale, recent years have seen deliberate efforts within the EU to ease explicit controls

on international movements of capital and to harmonize occupational licensure and related labor market regulations so that workers can move more easily among the labor markets of EU members states. Initiatives such as the Schengen agreement facilitate the movement of workers among countries.

As a matter of policy discretion, the EU countries may or may not liberalize factor markets still further. Immigration policy is a topic of great current interest and stormy political debate in several EU countries. Western Europe is surrounded by lower-wage regions – Eastern Europe, the countries of the FSU, the Middle East, and North Africa – with many actual and potential immigrants. EU enlargement, for example to admit countries like Poland, Hungary, or Turkey, would substantially lower formal migration barriers. Short of complete formal liberalization of migration policy, however, the countries of Western Europe must still make decisions about how strictly to enforce policies against illegal immigration, and regulations governing labor markets, social policies, housing markets, education, and similar matters make the Western European countries more or less attractive to potential migrants.

In summary, both because of the intrinsic costs of factor mobility and because of policy choices, labor and capital cannot, in general, flow instantaneously from one region to another within individual countries or among countries. The flows of capital and labor to which EU countries are increasingly exposed suggest that factor mobility is empirically important in these countries, and that it needs to be taken seriously in the evaluation of fiscal policy. Especially in view of the magnitudes of *gross* factor flows, it would be difficult to accept the stylized assertions that "labor is immobile" or "capital is immobile" in the EU context. Particularly when one contemplates the gradual evolution of the fiscal and other institutions of the modern welfare state over a period of several decades, it is obvious that the cumulative impact of sustained movements of labor and capital can be very substantial indeed. By the same token, international flows of labor and capital are sufficiently small, and the process of adjustment through which the returns to capital and labor are gradually equilibrated is sufficiently slow, that it is equally difficult to accept at face value simple stylized assertions that "labor is perfectly mobile" or "capital is perfectly mobile" in the European context. Rather, it seems that some intermediate characterization of labor and capital mobility is most appropriate. For these reasons, simple atemporal models of factor mobility, though they provide many insights into the analysis of fiscal (and other) policies, are too stark in characterizing factors of production as either perfectly mobile or perfectly immobile.

4 Factor Mobility and Fiscal Competition in a Dynamic Context

In considering how to extend the analysis of fiscal policy to take imperfect factor mobility into account, one must recognize that the stock and composition of productive human and non-human capital within a region depends on a host

of economic and demographic factors aside from interregional factor flows. Fertility, mortality, health, education, and retirement behavior all affect the size of the effective labor force over time. The stock of non-human capital is subject to gradual deterioration over time; flows of replacement, maintenance, and net investment can preserve and augment the stock of non-human capital. Many types of economic behavior and economic policy *within* a region affect the evolution of the stocks of human and non-human capital. A region that is open to factor flows has additional margins of adjustment. Like other forms of dynamic adjustment of these stocks, the migration of labor and the flow of capital across regional boundaries is not instantaneous, but rather proceeds at a rate that reflects economic incentives, intrinsic costs of adjustment, and economic policy and institutions.

These considerations suggest that fiscal competition in a world of imperfect factor mobility may best be analyzed in an explicitly dynamic framework. Over time, businesses within any one locality have to make decisions about whether to replace or maintain machines, buildings, and other capital assets that gradually depreciate. At any one moment in time, however, some significant fraction of the capital stock will be of relatively recent vintage, and immediate relocation of that part of the capital stock would entail the destruction of a substantial portion of its value. Similarly, most if not all individuals can consider changing locations over the course of their lifetimes, but the cost of doing so varies over the life cycle. Every year, some young soon-to-be workers complete their education and enter the work force with little or not prior attachment to specific employers; even younger "workers" are in the process of obtaining skills and education and do not even have strong attachments to particular types of occupations. These young people also are either single, have no children, or have very young children. For these and other reasons, it is relatively easy for them to consider changing locations. As workers age, however, their attachments to specific occupations, employers, and places tend to deepen, with the result that turnover and migration rates tend to fall over the life cycle (see. *e.g.*, Topel (1986, 1991), Topel and Ward (1992)). Thus, at any moment in time, there is a significant fraction of the work force for which relocation is relatively costly.

There are several ways to model imperfect mobility of labor and capital in an explicitly dynamic context. For example, the overlapping-generations model provides one natural framework for the analysis of labor mobility. In the simplest version of that model, households are assumed to live for only two periods, the first of which corresponds to youth and the second to mid-life and old age. In accordance with empirical findings about mobility over the life cycle, one might assume that the degree of mobility of individual workers declines over the life cycle (see, *e.g.*, Wildasin and Wilson (1996), Konrad (1997), and Leers *et al.* (1999)).

The overlapping-generations model is especially useful in analyzing long-term fiscal policies, especially those, such as public pensions, health-care, and long-term debt policy, which are likely to have important intergenerational impacts. A large portion of "welfare state" fiscal policy involves intergenerational transfers from those in the working part of the life cycle to those who are re-

tired, particularly through income and payroll taxes imposed on workers (or their employers) and the provision of public pensions and health care for retirees. Especially in the EU countries, the aging of the population is giving rise to increased financial stress on fiscal systems as the population of current beneficiaries increases in relation to the population of current contributors. Some commentators (see, *e.g.*, Straubhaar and Zimmermann (1993)) suggest that migration may play an important role in helping to restore the financial health of EU public pension systems.[6] Models that take life-cycle considerations explicitly into account are useful for the analysis of issues of this nature.

On the other hand, while a two-period overlapping generations model may provide a natural framework for describing the differential mobility of workers in different age groups, it shares with the atemporal modeling approach of Section 2 the somewhat unattractive "putty-clay" feature that workers are sharply characterized either as perfectly mobile or perfectly immobile, depending on their age. Plausibly, however, the ability or willingness of workers at various ages to change locations depends not only on their age but on the magnitude of the fiscal and other migration incentives that they face. Consider, as an alternative, the application of standard adjustment-cost models of investment to the problem of factor mobility.

Adjustment cost models are now standard tools for the analysis of the investment behavior of firms. These are explicitly dynamic models in which the flow of output is assumed to depend on the flow of services from the stock of capital and the flow of labor services used in the production process. Capital is a *stock* which is gradually depleted over time due to depreciation but which can be maintained or increased through a flow of purchases of new capital. If firms could costlessly adjust their capital stocks in response to changes in policy or other shocks, investment flows would occur at extremely high rates in extremely short bursts: firms would simply make their capital stocks adjust instantaneously to their new desired levels. In practice, however, the process of investment occurs gradually because it is costly to add, refurbish, or replace plant and equipment. Moreover, the costs of adjusting the capital stock are likely to rise as the rate of investment rises. While it is often possible to accelerate the planning and execution of investment projects, doing so normally entails extra out-of-pocket expense, disruption of existing operations, and other costs. Increasing adjustment costs provide firms with incentives to maintain a steadier flow of investment over time, resulting in slower adjustment of the capital stock to new, desired levels in response to changes in fiscal policy or other economic conditions. When investment and disinvestment is costly, capital is neither freely mobile nor completely immobile; rather, capital can be withdrawn from one use, and directed toward another, but only gradually.

Adjustment cost models are also used to study labor demand and the adjustment of the level of employment (see Hamermesh and Pfann (1996) for a survey). Just as firms cannot costlessly alter the stock of capital, similarly they incur costs in hiring new workers, and in laying off, firing, and retiring existing ones. Moreover, workers themselves, and their families, incur costs when they change jobs and locations. The reallocation of workers among firms – and, in

particular, the reallocation of workers among firms in different locations, *i.e.*, labor migration – can occur more or less rapidly depending on such fundamental mobility costs as search, transportation, and the acquisition of firm- and location-specific skills, and on policy-related costs such as penalties for job separation, barriers to labor mobility across political boundaries, and the like. An adjustment-cost model of employment and migration can accommodate the gradual response to market and fiscal incentives that these costs are likely to generate.

While an adjustment cost approach could be applied either to capital or to labor mobility, its classic application is in the context of investment analysis. As already discussed in Section 2, standard models of fiscal competition have commonly been employed to study the fiscal implications of capital mobility. It is therefore natural to initiate the analysis dynamic fiscal competition in an adjustment-cost framework applied to the study of imperfect capital mobility. The discussion returns later to the issue of labor mobility.

4.1 Fiscal Competition for Capital with Explicit Dynamics

Suppose, as in standard tax-competition models with mobile capital, that individual jurisdictions are small and open with respect to the external capital market, each thus facing a perfectly elastic supply of capital at the world interest rate of r. This is presumably the appropriate assumption to make for individual countries within Europe, no one of which accounts for more than a small share of the total world stock of capital; for the EU considered as a whole, this assumption might be more questionable. Suppose that each jurisdiction can impose a tax at an *ad valorem* rate τ_k on the return to capital located within its boundaries, *i.e.,* a source-based capital tax, and that the proceeds of this tax are used to transfer resources, either in cash or in kind, to the residents of the jurisdiction – assumed, for now, to be immobile. In contrast to the traditional models, however, suppose that the capital stock within a given jurisdiction entails costs of adjustment that are increasing in the level of investment.

In this setting, a local source-based tax on capital does result, eventually, in an outflow of capital. In the long run, capital invested within the locality continues to earn the same net rate of return as elsewhere. The magnitude of the capital outflow needed to achieve this depend on the elasticity of demand for capital, ϵ, which in turn depends on the local production technology, including the degree of substitutability between capital and other inputs like labor as well as their relative importance in the local production process.[7]

More importantly, one can show that the change in the capital stock that results from a permanent and unanticipated increase in τ_k follows a path of exponential decay. The speed with which the capital stock falls in response to a tax increase is described by a variable ρ the value of which depends, in particular, on the nature of the adjustment-cost technology. When the costs of adjustment are high, the rate of adjustment of the capital stock ρ is small, while in the extreme case where there are no adjustment costs, adjustment

is instantaneous and capital is "perfectly mobile." As adjustment costs rise, the "short run" becomes, effectively, longer and longer, and the model behaves increasingly like one in which capital is "perfectly immobile."

Although the long-run adjustment of the capital stock in this dynamic model corresponds precisely to the finding of standard atemporal models of tax competition, the situation is quite different in the short run. In fact, the capital stock does not change at all at the moment that the tax rate is increased, and the adjustment of the capital stock proceeds gradually thereafter. Thus, in this model of explicit dynamic adjustment, it is not correct to describe capital either as "perfectly mobile" or as "perfectly immobile." In fact, the adjustment-cost model effectively includes these polar opposites of the atemporal model as special cases. More precisely, it shows that the polar cases are not so much *alternative* models of the effects of fiscal policy but rather *incomplete* models, since both cases arise, but only at the very beginning and at the very end of the adjustment process.

What are the implications of this gradual adjustment for the analysis of redistributive policies? The fact that capital is not very mobile in the short run means that capital income can be a target for redistributive policy: the returns to the owners of local capital consist of quasi-rents that can be captured by local tax or other policies. Since the capital stock is initially fixed, a tax on the profits of firms or on the return to capital has no immediate impact on the productivity of labor or on the before-tax income of workers. The owners of capital, or the firms that utilize capital – assuming that these are distinct from the workers – suffer a reduction in net income equal to the tax imposed on them, and the net income of local residents rises correspondingly thanks to the transfer of this income to them through the public sector. Over time, however, capital flows out of the jurisdiction, causing labor productivity and the earnings of labor to fall. In the long run, the net return to the capital that remains within the jurisdiction is restored to the world net rate of return, and the net return to labor actually falls, despite the redistributive transfers received by residents. To the extent that workers themselves own the capital or the firms that are the subject of taxation, of course, the net benefits of redistribution are smaller because the workers themselves are taxpayers as well as fiscal beneficiaries.

Since workers gain in the short run but lose in the long run, it is unclear whether this redistributive policy, on balance, helps them or harms them. To assess the net effect, one can calculate the effect of an increase in the size of the tax/transfer program on the present value Y of workers. Suppose that local workers initially own the share θ of the local capital stock; if all capital is owned by non-residents, then $\theta = 0$, whereas $\theta = 1$ if it is owned entirely by residents. Formal analysis shows that an increase in the tax rate on capital will raise (or lower) Y as $\tau < (>) r(1-\theta)/\rho\epsilon$ and that the optimal tax rate, from the viewpoint of local residents, is

$$\tau = (1 - \theta)\frac{r}{\rho\epsilon}. \tag{1}$$

This remarkably simple expression sheds considerable light on the role of imperfect capital mobility on the impact of redistributive policy. It looks like familiar

inverse-elasticity rules for optimal taxation in that the elasticity of demand for capital appears in the denominator of the expression, indicating that a high demand elasticity for capital (associated with a high degree of substitutability between labor and capital) implies a low tax rate on capital. It also reveals, as one would expect, that the greater the proportion of local capital (or firms) owned by workers, the smaller is the desired scale of the redistributive policy; obviously this policy is most attractive to workers when the entire tax base is owned by others ($\theta = 0$).(The role of local ownership in the formulation of tax policy with mobile capital is also emphasized by Sorensen (2000).) Most importantly, however, (1) shows that the beneficiaries of local redistributive policy would wish to tax capital more heavily when the capital stock adjusts slowly (ρ is small), but that the optimal tax rate is low when the capital stock adjusts rapidly. Indeed, if the capital stock adjusts sufficiently slowly, the optimal tax rate reaches 100%, whereas the optimal tax rate approaches zero as the speed of adjustment becomes so rapid as to be almost instantaneous.

While the qualitative implications of (1) are quite intuitive, it is perhaps surprising that the expression for the optimal tax takes such a simple form. It is straightforward to use (1) to calculate optimal tax rates under different assumptions about speeds of adjustment, demand elasticities, and other parameters. As noted above, a plausible value for ϵ might be as high as 1.3, while an elasticity of 1.0 would be be consistent with a somewhat lower elasticity of substitution between labor and capital. The speed of adjustment, ρ, can be expressed in terms of the number of years required to complete half of the adjustment of the capital stock in response to a change in policy.[8] Estimates from empirical studies suggest that a period of several years is typically needed for half of the capital stock adjustment to occur; a decade is likely to be more than sufficient. On the other hand, if taxed "capital" were like financial assets, which can be moved very rapidly, half of the adjustment might be completed in just a matter of months.

Table 6 shows the results of calculations of optimal tax rates for a variety of assumed parameter values. The three panels of this table correspond to differing assumptions about the elasticity of demand for the mobile factor of production. The columns of each panel represent a variety of assumptions about the speed of adjustment for the taxed resource and the rows correspond to varying assumptions about the share of the taxed resource owned by the residents of the jurisdiction. As described above, the first two panels, which assume an elasticity of demand of 1 and 1.33, respectively, are appropriate for the analysis of a source-based tax on capital; the third panel is discussed further below.

If redistributive policy is chosen to maximize the welfare of workers who have no ownership stake in local firms, empirically-plausible rates of capital stock adjustment — with half of the adjustment occurring within 2–5 years — imply net fiscal burdens on capital of around 15–30%. Although, strictly speaking, the model only allows for one type of capital, it is clear that optimal tax rates would be differentiated among different types of capital if possible. Table 6 suggests that very long-lived capital would be taxed at a considerably higher rate, up to and including 100%, while capital that can adjust very rapidly

would be taxed lightly, at a rate of 10% or even less. When a portion of the taxed capital is owned by local residents, source-based capital taxes become a less attractive tool for rent capture. In the extreme case, of course, the optimal capital tax rate drops to zero; more generally, as shown in (1) and as reflected in the table, the optimal tax rate falls in proportion to the share of capital owned by those whose interests the tax policy reflects.

In comparing these calculations with empirical counterparts, it is important to remember that τ_k in the model represents the source-based fiscal burden on capital, *net* of any public expenditures or subsidies that offset taxes *per se*. The calculation of effective tax rates on corporation income and other source-based taxes is a very complex matter, but few if any studies of effective tax rates even attempt to estimate the impact of expenditure-side policies on the return to capital. Undoubtedly some forms of public expenditure, such as provision of infrastructure or subsidies to public enterprises, offset part of the burden imposed by source-based taxes, so the gross fiscal burden on capital arising from the tax system alone certainly overstates the net fiscal burden. Given these uncertainties, the figures shown in the table are, very roughly, in the range of values suggested in the literature (*e.g.*, Mendoza and Tesar (1998)).

4.2 Fiscal Competition for Imperfectly Mobile Labor

While the analysis presented so far treats capital as an imperfectly mobile factor of production and labor as completely immobile, it is apparent that the same or similar analysis can be used to evaluate the implications of imperfect labor mobility. Technically speaking, there is no obstacle to simply relabeling the factors of production, treating labor as the mobile resource. In this context, one might think not only of capital but of land, natural resources such as fisheries, and natural and very long-lived infrastructure such as harbors and road systems as the immobile factor of production. Suppose that "native" residents claim the entire return to this immobile factor of production and to a fraction θ of the earnings of labor, and that a fraction $1-\theta$ of the earnings of labor accrues to workers whose welfare does not "count" in the determination of fiscal policy. This might correspond, say, to the initial share of foreign-born workers within a country.

If the return to labor accounts for a 75% share of national income, and if the production function takes the standard Cobb-Douglas form, then, as noted above, the elasticity of demand for labor is 4. Under this assumption, the bottom panel of Table 6 presents calculations of the net fiscal burden on imperfectly-mobile labor that would maximize the income of the immobile factor(s) of production, for various values of the speed of adjustment for the work force and for the share of labor income accruing to "native" residents. In this context, it becomes interesting to consider quite long periods of adjustment, on the order of a decade or longer. As is clear from the table, the net fiscal burden on mobile workers is relatively modest, even when the adjustment process is quite prolonged, provided that a relatively small fraction of the labor force consists of "non-native" workers. Once again, it should be remembered that the proper

interpretation of the optimal tax rate in (1) is the fiscal burden on the mobile resource, *net* of any benefits from cash or in-kind transfers.

This caveat is especially critical in considering the fiscal competition for workers since such a large fraction of public expenditure is incurred for provision of transfers and pubic goods and services for workers and their families. When non-natives reside in a typical EU country, even as illegal immigrants, they obtain the benefits of numerous public services – transportation, public health, public safety, water – that are provided either at a zero price or at a price below the marginal cost of production. Legal immigrants, and to some extent illegal immigrants also, obtain benefits from public provision or financing of health care, education, and, in many instance, from cash transfers such as family allowances. The calculation of the net fiscal burdens or benefits on different types of workers and families is easiest for programs such as public pensions, where benefits are entirely in cash. For health, education, and other public goods and services, the monetization of benefits is very difficult, and statements about the net fiscal burdens borne by workers or families of any particular type are therefore necessarily rather speculative.

At the extremes of the income distribution, of course, it is obvious that the rich are net fiscal contributors and that the poor are net fiscal beneficiaries. The top 10% of income recipients in any EU country account for a highly disproportionate share of total income, earnings, and tax revenues, but their utilization of public services and the benefits that they receive in the form of cash transfers are not comparably disproportionate. (The reverse is probably true for the bottom 10% of income recipients, especially the elderly. As discussed previously, however, this group is perhaps the least mobile of any major demographic category.) If these individuals become increasingly able over time to relocate from one country to another, the desirability of maintaining extremely high net fiscal impositions on them is likely to become more doubtful – as indeed the evidence from state income taxation in the US suggests.

4.3 Redistributive Politics and Economic Integration with Imperfect Factor Mobility: Myopia and Cross-Owner -ship of Resources

Broadly speaking, the formal analysis of redistributive policy with imperfect factor mobility suggests that there is scope for effective redistribution even when the targets of redistribution may ultimately be able to enter or leave the jurisdiction in which the policy is implemented. However, the "desired" effects of redistributive policies occur in the near term, before factor owners have sufficient time to relocate in response to policy changes, while the "undesired" consequences of these policies tend to occur in the more distant future. As a practical matter, in a world where not all households or politicians plan over infinitely long horizons, there is clearly scope for differences of opinion about the weighting of the present benefits of redistribution against its future costs. Just as in the macroeconomic sphere of debt policy, some households may take a

very long-term intergenerational perspective on policy evaluation, while others may be more myopic. More myopic decisionmakers would tend to favor more extensive redistribution than those who attach greater weight to the longer-term evolution of the economy.

While many different domestic groups may compete in the political process for rent transfers, most political systems make it relatively difficult for non-residents to influence policy. Thus, if, for example, a large share of a nation's capital stock is owned by foreigners (a low value of θ), heavy source-based taxation of capital offers the opportunity for well-represented native residents to capture rents from poorly-represented non-residents as indicated in Table 6. Of course, foreign investors might well anticipate the fact that their capital could be expropriated through unfavorable fiscal policies and refrain from investing in the first place. Indeed, it is well-known that international cross-ownership of capital is rather limited (Baxter and Jermann (1997), Wildasin and Wilson (1998)). This suggests an interesting tension between those forces favoring increased capital mobility within Europe – fundamental technological change favoring the expansion of multinational enterprise, regulatory liberalization and standardization – and the fiscal incentives for source-based capital taxation. The speed of adjustment of the capital stock (ρ) is falling over time for European countries, both because the intrinsic costs of factor mobility are falling and because policy barriers have tended to fall as well, developments that favor a reduction in the net fiscal burden on capital. However, the extent of cross-ownership of capital is increasing over time as well, a development that would favor higher fiscal burdens on capital. Starting from a situation where there is limited cross-ownership of capital, there are obvious gains from reduced reliance on source-based capital taxes to finance redistribution, but there is an obvious time-consistency problem as well. There are numerous forms of commitment mechanisms, such as the immediate provision of irreversible subsidies to capital in the form of public infrastructure or institutional constraints such as international treaties, that can help to solve the time-consistency problem.

5 Conclusion: Challenges for Fiscal Policy in Europe

The process of economic integration in Europe is unfolding gradually over time. Increased integration of factor markets is one part of that process. In part because of conscious efforts by governments to reap the economic benefits of economic integration, in part because of changes in fundamental political structures (especially the breakup of the Soviet Union and the end of the Cold War), and in part because of long-term improvements in transportation and communications technology, increasing mobility of labor and capital is a fact of life in modern Europe. This mobility is not and, practically speaking, never will be perfect. But the erosion of barriers to factor mobility nevertheless carries important implications for redistributive fiscal policies, the hallmark of the modern

European welfare state.

The analysis of redistribution with imperfect factor mobility presented above shows that increasing factor mobility tends to limit the effectiveness and the attractiveness of redistributive policies. The integration of capital markets, for example, intensifies competition for capital and while it may still be possible to extract some quasi-rents through the use of source-based revenue instruments such as the corporation income tax, the optimal rate of taxation is reduced when capital can flow more rapidly into or out of a country. Indeed, competition for capital is already seen in some policy circles as a dangerous trend (see, *e.g.*, OECD (1998b)).

Looking forward over the next half-century or so, however important capital mobility may be, demographic change – especially the effects of low fertility and mortality in affluent countries surrounded by lower-wage regions – seems likely to play a crucial role in the evolution of fiscal policy. The remainder of this section discusses several of the challenges that EU countries are likely to confront over this time horizon.

5.1 Migration Policy and Fiscal Policy

The world has witnessed numerous episodes of major population movements in the past, such as the flow of migrants from the old to the new world in the nineteenth century. In previous epochs, however, the role of the state in national economies has been far more limited than is true today. Whereas migrants in earlier eras might have faced effective tax burdens equal to perhaps 10–15% of their incomes and might have received fiscal benefits from the state of a similar magnitude, the situation is entirely different in an age when the revenues and expenditures of modern welfare states amount to nearly half of GDP. There may have been a presumption in earlier times that almost all of the economic benefits and costs of the migration decision would be borne by the migrant, but in Europe today extensive systems of taxation, transfers, and public services insure that society as a whole shares substantially in these benefits and costs.

In recent years, despite high unemployment rates and many regulations that complicate the search for employment, EU labor markets have been magnets for migrants. A first question for policy is whether and by how much to impede the flow of population into the EU countries. In terms of the dynamic model described above, policymakers may be able to affect the "adjustment cost technology" for labor, facilitating immigration and speeding up the adjustment process or impeding labor mobility and slowing it down. Decressin and Fatás (1995) find that labor flows among EU regions are about half as responsive to labor demand shocks as in the US, suggesting perhaps the higher intrinsic costs of labor mobility in Europe but also the potential scope for reduction in the policy barriers to migration.

From the welfare viewpoint, liberalized immigration policies can yield important benefits, particularly improved efficiency in the allocation of labor. However, inflows of labor from neighboring countries also put downward pressure on wages in the EU countries, harming native workers whose labor is substitutable

with that of migrants. Within the context of inflexible EU labor markets, reductions in real wages may occur rather slowly, during which time slackness in labor markets may appear as unemployment. Indeed, immigration may create pressures to protect the employment and earnings of existing workers, perhaps retarding the process of institutional change in the labor market in the short run, even as it undermines the institutions that support labor market rigidities in the long term.[9] But whether immigration contributes to lower real wages or to higher unemployment, it worsens the labor-market environment for existing workers, especially those with fewer skills.

Redistributive policies provide a means by which policymakers can ameliorate undesired adverse distributional effects arising from increased immigration. However, most redistributive instruments (means-tested cash and in-kind benefits financed by taxes on high-income individuals and source-based capital income taxes) traditionally apply to all households on a residence basis. If immigrants are not or cannot be excluded from social benefits, then the attempt to compensate those who are adversely affected by immigration (for example, low-income native workers who compete with low-skilled immigrants) will in itself increase the incentives for further immigration, reducing and possibly negating altogether the potential gains to domestic residents from greater immigration (Wildasin 1994, Razin and Sadka, 1995). Thus, policymakers face a dilemma in dealing with the migration pressures now bearing on Western Europe. Liberalized immigration policies would speed up the flow of migrants from poor surrounding regions, enabling efficiency gains from labor mobility to be realized but also bringing about effects on the distribution of income that may be undesirable. At the same time, as the analysis of fiscal competition in Section 4 makes clear, increasing the mobility of labor and the speed with which migration takes place can also limit the usefulness of redistributive policy tools, which might otherwise be employed to offset some of the impacts of migration on the distribution of income.

5.2 Regional Policy

The EU countries as a whole are affluent. However, some regions within the EU are relatively poor. One goal of the EU's structural funds is to promote economic development in poor regions, or to assist the residents of these regions. The CAP, which helps to maintain incomes for those in the agricultural sector, should probably also be viewed as part of the EU's regional policy. The agricultural work force in Europe has been in a gradual decline, with the agricultural share of the EU work force falling from 7.9% to 5.1% just during the decade 1986–1996, for example (OECD 1997). The reallocation of labor from rural agriculture toward urban industry and services has been the result of intersectoral and interregional real-income differentials, an adjustment process that would have proceeded more rapidly in the absence of the CAP (and perhaps other policies), which has propped up incomes for workers in the rural areas of EU countries (Baldwin *et al.* (1997)).

Regional policy for the EU countries, however, involves not only the regions

within existing EU member states, but other neighboring regions as well – the countries of eastern and southeastern Europe and of North Africa, in particular. Policies dealing with regions outside the EU are less systematized than for those within, but include trade policy, migration policy, and economic development policies. One of the main questions of regional policy in this regard is actually the issue of EU enlargement. Since EU membership entails free trade and free movement of labor and capital, it offers substantial potential benefits to many of the residents of new member states.

Equity considerations often figure prominently in regional policies. Rich regions typically transfer resources to poor regions, foreign aid generally flows from rich countries to poor countries, and sectoral subsidies generally flow to declining rather than to growing sectors of the economy. A perennial question is whether these policies promote reasonable economic goals or whether they simply interfere with the efficient functioning of markets. If a region is subject to adverse demographic, technological, political, economic, or other factors, is it better to expend resources in developing or simply subsidizing the region or to facilitate the flow of population and capital away from the region?

The impact of regional policies is critically dependent on the degree of factor mobility. Subsidies that promote investment or employment in a region may raise wages there if workers are immobile. If, on the other hand, workers are interregionally mobile, these policies will reduce the flow of labor out of the region, benefiting owners of land, natural resources, and long-lived capital, but at a cost in terms of lost opportunities for workers to move to regions where they could be more productively employed. To consider one dramatic recent example, consider the Balkan situation. Because of political and military strife, the EU countries have already had to face the dilemma of managing a significant number of displaced persons. Current policy discussions focus on the rebuilding of Kosovo, Albania, Macedonia, and presumably Montenegro and Serbia as well. Such a policy is bound to be quite costly, though necessary to restore the economic health of the region. As an alternative, one might allow or even facilitate the relocation of additional refugees to EU countries.

This example highlights the policy trade-offs for the EU countries: in the absence of economic growth and prosperity in neighboring regions, migration pressure is heightened, making it more difficult to enforce immigration restrictions and exacerbating whatever difficulties immigration poses for the destination countries. One way to promote economic development of poor regions is through interregional transfers, whether in the form of simple economic relief, through investment in infrastructure, or through subsidies to private investment. These transfers, however, impose fiscal burdens on the donor regions. As an alternative, greater integration of the markets for labor, capital, and goods and services through liberalized migration and trade policies may promote more rapid economic development of poor regions and the opportunity for mobile factors in poor regions to escape to more productive uses elsewhere. For the reasons discussed above, however, the redistributive fiscal policies that characterize the affluent countries of the EU may be difficult to maintain in the face of such liberalization.

ENDNOTES

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1. There is a now large and rapidly-growing literature on fiscal competition; for surveys with many additional references, see Cremer *et al.* (1996), Wildasin (1998), Wilson (1999), Oates (forthcoming), and Wellisch (2000). For simplicity, the present discussion focuses almost entirely on the interplay between redistributive policy and factor mobility, rather than on the more classical margins of behavioral adjustment to fiscal policy such as labor-leisure trade-offs. For a recent analytical survey of redistributive policy that addresses these and other issues, see Boadway and Keen (forthcoming).

2. Because a single small locality cannot perceptibly affect the net rate of return on capital, it is tempting, but inaccurate, to say that capital does not bear the burden of the local tax. As shown by Bradford (1978), building on the insights of Brown (1938), while the local tax only reduces the net return to capital by a very small amount, the reduction in the net return falls on the worldwide stock of capital. The loss in real income for capital owners worldwide is of the same order of magnitude as the local tax. For more discussion, see Wildasin (1986, 107–108).

3. Residence-based taxation of capital income is especially likely to affect the locational choices of high-income households, for whom non-wage income is particularly important. Just to illustrate this well-known empirical regularity with reference to the US, for the approximately 5% of US taxpayers with the highest levels of adjusted gross income in 1997, wage and salary income only amounted to approximately 57% of total AGI, whereas the comparable figure for taxpayers with average AGI levels was 83% (Hollenbeck and Kahr, 1998-1999). (Since these figures are based on the incomes of taxpayers as reported for tax purposes, they already reflect the fact that much non-wage income is sheltered from taxation.) These top-bracket taxpayers had an average level of taxable dividend, interest, and capital gains income of approximately $21,000. Discounting at 5%, a permanent move between localities whose average tax rates differ by 10% would thus result in a wealth gain or loss of about $40,000. See Wildasin (1993) for discussion of interstate differences in average tax burdens in the US and their implications for migration incentives.

4. Formal models of fiscal competition that explicitly incorporate the provision of public goods and public inputs have been developed in the literature and yield similar conclusions regarding the impact of factor mobility on the allocative and distributional consequences of fiscal policy; indeed, similar conclusions emerge as well when considering other types of policies as well, such as environmental regulation. See, for example, Keen and Marchand (1997), Oates

and Schwab (1988), and, for additional references, Oates (1999).

5. In the Netherlands, for example, net migration of foreigners was approximately 45–50 thousand persons annually during the period 1994-1997, but naturalizations exceeded this amount by 5–30 thousand per year, resulting in a reduction in the share of foreign population even in the face of high levels of immigration. Approximately 100,000 people per year have acquired French citizenship in recent years; in Germany, the corresponding figure is over 250,000 annually.

6. Standard generational accounting methods (Kotlikoff (1992)) show that young workers are net fiscal contributors under existing policies, that is, they pay more into the fiscal system, in present-value terms, than the benefits that they receive. Wildasin (1999) provides empirical analysis of the implications of migration for public pensions systems in the EU.

7. In terms of Figure 1, one can see that the reduction in the equilibrium capital stock that results from a tax on mobile capital depends on the elasticity of the VMP_K schedule, *i.e.*, on the elasticity of demand for capital in the local economy. Precisely the same considerations come into play in assessing the effect of local taxation on the *long run* equilibrium level of capital in a dynamic adjustment-cost model. As a point of reference, in the familiar case where total output is given by a Cobb-Douglas production function, the elasticity of demand for capital is (in absolute value) given by $\epsilon = 1/(1-\alpha)$ where α is the share of national income accruing to capital. If capital income amounts to one-fourth of the total, then $\epsilon = -1.33$ More generally, a higher elasticity of substitution in production between labor and capital would imply that the capital stock is more responsive to the local tax rate in the long run, while a lower elasticity of substitution would imply a lower elasticity of demand for capital and a correspondingly smaller response to the local tax rate.

8. Specifically, with a speed of adjustment of ρ, the half-life of the adjustment process is simply $T = -\ln(.5)/\rho$.

9. The example of German unification is instructive. As explained by Sinn and Sinn (1994) and Sinn (1995), the efforts of labor unions and policymakers have succeeded in extending high real wages into the former East Germany, simultaneously protecting the real wages of workers in the West and contributing to higher unemployment. For recent discussions of labor market institutions and the unemployment problem in the EU countries, see, e.g., Bertolo and Ichino (1995), Burda and Mertens (1995), Siebert (1997), and Nickell (1997). Schöb and Wildasin (1998) analyze the efficiency and distributional effects of labor market integration in a system of jurisdictions with unemployment.

APPENDIX

This appendix outlines a model which underlies the dynamic tax analysis described in the text. Further details, including explicit derivations, are available on request from the author.

The model focuses on a single small jurisdiction. Within this jurisdiction, capital is combined with immobile and inelastically-supplied factors of production – called "labor", but also interpreted to include land, natural resources, public infrastructure, and other fixed inputs – to produce one or more traded goods. Assuming that the prices of traded goods are unaffected by local policies, these goods may be treated as a composite commodity which is taken as numéraire. Thus, let $f(k_t)$, with $f' > 0 > f''$, denote output within the locality at time t, expressed as a function of the amount of capital employed within the jurisdiction at that time, k_t. The strict concavity of f reflects the presence of other, fixed factors of production. Assuming that local factor markets are perfectly competitive, these factors will receive a gross income at time t equal to $w_t \equiv f(k_t) - k_t f'(k_t)$. It is assumed that these factors are owned by local residents who themselves are immobile and assumed to be identical. In order to obviate any issues relating to intergenerational transfers, these households are also assumed to be infinitely-lived (or, equivalently, to be linked through altruistically-motivated intergenerational transfers).

Capital is traded in external markets, where it earns a rate of return r that is unaffected by local policies and is thus taken as exogenously fixed for the purposes of the analysis. It is also assumed to be time-invariant. Firms located within the locality can acquire capital at a cost of r and also must pay a local tax on capital. In order to keep the analysis of capital tax policy as simple as possible, and, in particular, to obviate issues of time consistency as well as to maintain ease of comparison with atemporal models used in previous literature, assume that the locality imposes a per-unit tax on capital at a *time invariant* rate of τ_k. (There are obvious issues concerning dynamic consistency that arise in this context; they are, however, left for future analysis.) Thus, the tax-inclusive cost of capital to local firms is $r + \tau_k$.

The dynamics of the model are determined largely by adjustment costs that firms must bear when they undertake local investment; in particular, these costs preclude instantaneous adjustment of the local capital stock. Specifically, the cost of adjustment incurred by local firms is given by $c(i_t)k_t$, with $c' > 0 < c''$ where i_t is the rate of gross investment within the locality at time t, i.e., the amount of expenditures on capital goods expressed as a proportion of the amount of capital in the locality, k_t. This adjustment cost is assumed to take the form of lost output and is thus expressed in units of numéraire. Note that since $c(\cdot)$ is homogeneous of degree zero in the level of investment and the total stock of capital, total adjustment costs are homogeneous of degree one in these variables. This assumption, and the assumption that adjustment costs are convex in the rate of investment, are standard ones in the investment literature. Assuming that capital depreciates at a constant exponential rate of

δ, the evolution of the local capital stock takes the usual form:

$$\dot{k} = (i_t - \delta)k_t. \tag{A1}$$

The cash flow of local firms at time t is the value of their output net of adjustment costs, less investment expenditures, less tax payments, less payments for local labor,

$$\pi_t = f(k_t) - c(i_t)k_t - \tau_k k_t - i_t k_t - w_t. \tag{A2}$$

Assume that no agents face liquidity constraints or other capital market imperfections and that all agents plan over infinite horizons. Local residents are assumed to plan their lifetime private consumption streams subject to the constraint that the present value of lifetime consumption is equal to the present value of lifetime income net of any taxes or transfers, firms maximize the present value of profits net of taxes or subsidies, and the local government must satisfy a budget constraint that requires the present value of public expenditures to be equal to the present value of tax revenues. Under these assumptions, firms choose the paths of investment i_t and capital k_t to

$$max \qquad \Pi \equiv \int_0^\infty \pi_t e^{-rt} dt \tag{P}$$

subject to (1), with an initially-given stock of capital $k_0 = K_0$.

In addition to collecting revenues from the taxation of local capital, the local government may collect revenue from or provide subsidies to local residents in a lump-sum fashion and it can spend money on the provision of public goods that benefit local residents. Let T denote the present value of lump-sum taxes imposed on local residents; under the assumptions of the model, the precise time path of revenue flows from these taxes is unimportant. Assume that the level of provision of public goods is exogenously fixed and let $\bar{G}$ denote the present value of public expenditures on public good provision; provided that public good provision levels are fixed, their time path is unimportant. Since the stock of capital in the locality can vary over time, the amount of tax revenue collected from capital taxation can also vary, with $t_k k_t$ the amount of revenue collected at time t. The local government budget constraint requires that

$$\bar{G} = T + \int_0^\infty \tau_k k_t e^{-rt} dt. \tag{A3}$$

Local residents derive utility from private consumption and from local public goods. The latter, however, are treated as exogenously fixed, and can be ignored in the remainder of the analysis. No restrictions are placed on the role of public goods in the preference structure of households. The preferences of households over private consumption streams can also be very general; essentially all that is required is that household intertemporal utility maximization exhausts the present-value lifetime budget constraint. This basic assumption implies that the welfare of local residents is an increasing function of lifetime wealth. As already noted, households are endowed with fixed supplies of labor, earning a

gross return of $w_t = f(k_t) - k_t f'(k_t)$ in every period. Local residents may also be endowed with some stock of capital $\bar{k}$ which earns a flow return of $r\bar{k}$ in every period, as well as some ownership shares in local and foreign firms. Let θ represent the local ownership share in local firms, with $0 \leq \theta \leq 1$, and let $\bar{\Pi}$ represent the present value of profits derived from ownership of firms outside of the locality. Under these assumptions, the present value of lifetime income for local residents is given by

$$Y = \int_0^\infty \left[f(k_t) - k_t f'(k_t)\right] e^{-rt} dt + \bar{k} + \theta\Pi + \bar{\Pi} - T. \qquad (A4)$$

Under the assumptions of the model, local tax policy affects the welfare of local residents only insofar as it affects Y.

The question then arises as to what value of the local tax rate would maximize the welfare of local residents. The analysis of this question requires explicit comparative dynamic analysis since, starting from any initial situation, a change in the local tax rate initiates a process of adjustment of the local capital stock, and the optimal local tax rate is the one that makes local residents as well off as possible, taking into account the impact of this entire adjustment process.

In particular, a permanent increase in the local tax rate entails a trade-off between short-run benefits and long-run costs. In the long run, a higher local tax rate simply drives capital out of the local jurisdiction, eventually harming local residents. However, in the short run, a higher local tax rate allows local residents to collect tax revenues whose burden falls partly on the non-resident owners of local capital. To strike the best balance between the short-run benefit and long-run cost of a higher tax obviously requires taking into account how much of the local capital stock is owned by non-residents (the parameter θ) and the speed of adjustment of the capital stock (the parameter ρ). The long-run harm that the local tax on capital ultimately causes depends on the elasticity of demand for capital ϵ, which in turn depends on the underlying production technology. If, for example, capital is used in fixed proportions with local immobile factors, ϵ would be zero and no capital would leave the local economy in response to higher taxes, no matter how much time is allowed for adjustment of the capital stock; more generally, the greater the elasticity of demand for capital, the greater the long-run effect of taxation on the long-run equilibrium level of capital in the locality. The short- and long-run trade-offs involved in choosing the local tax rate are thus quite complex. Nonetheless, they can be distilled into the very simple formula for the optimal local tax rate given in the text.

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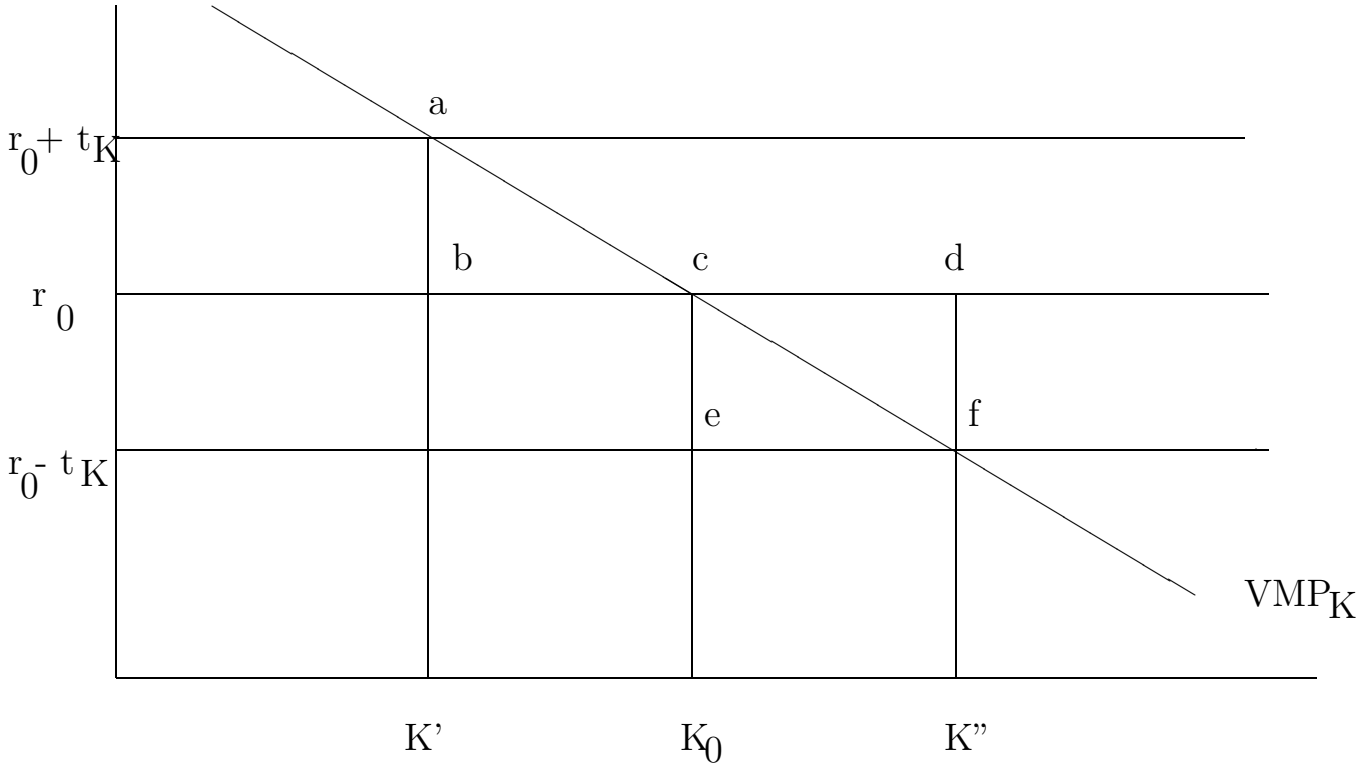

FIGURE 1

Table 1. Total Tax Revenue as Percentage of GDP

	1965	1970	1975	1980	1985	1990	1995	1997
Austria	33.9	34.9	37.7	40.3	42.4	41.0	42.4	44.3
Belgium	31.1	35.7	41.6	43.7	46.9	43.9	45.4	46
Czech Rep.							40.1	38.6
Denmark	29.9	40.4	41.4	45.4	48.9	47.1	49.4	49.5
Finland	30.3	32.5	37.7	36.9	40.8	44.9	45.2	46.5
France	34.5	35.1	36.9	41.7	44.5	43.0	44.0	45.1
Germany*	31.6	32.9	36.0	38.2	38.1	36.7	38.5	37.2
Greece	18.2	20.9	21.0	24.3	29.0	29.7	32.1	33.7
Hungary							42.7	39.4
Iceland	26.2	27.0	29.6	29.2	28.4	31.4	31.2	32.2
Ireland	24.9	29.9	30.2	32.6	36.4	34.2	33.1	32.8
Italy	25.5	26.1	26.2	30.4	34.5	38.9	41.2	44.4
Lux.	27.7	28.9	39.7	43.0	47.7	43.9	44.4	46.5
Netherlands	32.8	37.1	43.0	45.2	44.1	44.6	42.0	41.9
Norway	29.6	34.9	39.9	42.7	43.3	41.8	41.5	42.6
Poland							42.3	41.2
Portugal	15.8	19.8	21.2	24.7	27.2	30.2	33.3	34.2
Spain	14.7	16.9	19.5	23.9	28.8	34.4	32.8	33.7
Sweden	35.0	39.8	43.4	48.8	50.0	55.6	47.9	51.9
Switz.	19.6	22.5	27.9	28.9	30.6	30.9	33.5	33.8
Turkey	10.6	12.5	16.0	17.9	15.4	20.0	22.6	27.9
UK	30.4	37.0	35.4	35.1	37.5	36.3	35.2	35.4
US	25.0	28.1	27.5	27.6	26.9	27.6	28.8	29.7
EU 15	27.8	31.2	34.1	36.9	39.8	40.3	40.5	41.5

Source: OECD, 1999, Table 3. * Unified Germany beginning 1991.

Table 2. Sources of Tax Revenue, as Percentage of Total Taxation

EU 15	1965	1970	1975	1980	1985	1990	1995	1997
Personal Income Tax	23.9	25.2	18.5	29	28	27.2	26.4	25.5
Corporate Income Tax	6.7	6.8	6	5.9	6.4	6.8	6.9	8.5
Social Security Contributions	22.8	24.3	28.4	29	28.7	28.1	29.1	28.6
Taxes on Property	6.7	5.7	4.9	4.1	3.8	4.2	4.3	4.5
Taxes on Goods and Services	38.2	36.4	31.3	31	31.6	31.6	31.2	30.9
US								
Personal Income Tax	31.7	36.6	34.6	39.1	37.8	37.7	36.3	39
Corporate Income Tax	16.4	13.2	11.4	10.8	7.5	7.7	9.4	9.4
Social Security Contributions	13.3	16.1	20.5	21.9	25.2	25.8	25.1	24.2
Taxes on Property	15.9	14.2	13.9	10.7	10.7	11.4	11.3	10.7
Taxes on Goods and Services	22.8	20	19.5	17.6	18.8	17.3	17.9	16.7

Source: OECD (1999), Tables 11, 13, 15, 23, and 25.

Table 3. Foreign Direct Investment

Percentage Share of Investment, Foreign Direct Investment Inflows and Outflows

		1970	1975	1980	1985	1990	1995	1997
Belgium								
	Inflows		6.86%	6.24%	7.15%	17.66%	19.07%	24.40%
	Outflows		1.71%	0.79%	2.02%	13.86%	20.71%	15.23%
Denmark								
	Inflows		3.37%		1.02%	4.22%	12.25%	8.16%
	Outflows		0.99%		2.82%	5.53%	8.79%	12.73%
Finland								
	Inflows		0.77%	0.21%	0.88%	2.23%	5.36%	10.53%
	Outflows		0.29%	1.05%	2.72%	7.64%	7.67%	26.04%
France								
	Inflows		1.89%	2.15%	2.58%	5.16%	8.09%	9.01%
	Outflows		1.62%	2.03%	2.22%	13.64%	5.40%	13.87%
Germany								
	Inflows		0.81%	0.18%	0.40%	0.81%	2.28%	2.40%
	Outflows		2.56%	2.58%	4.38%	7.72%	7.44%	9.73%
Ireland								
	Inflows		8.05%	5.12%	4.53%	7.37%	13.42%	19.10%
	Outflows					4.29%	7.61%	7.02%
Italy								
	Inflows	2.36%	1.22%	0.52%	1.22%	2.89%	2.57%	1.94%
	Outflows	0.43%	0.65%	0.67%	1.98%	3.33%	3.73%	5.46%
Netherlands								
	Inflows	7.30%	6.73%	6.40%	5.97%	20.83%	15.58%	17.36%
	Outflows	15.20%	13.76%	16.64%	10.73%	25.96%	25.96%	39.63%
Norway								
	Inflows		2.26%	0.35%	-2.72%	4.02%	7.88%	10.10%
	Outflows		1.77%	1.48%	8.31%	5.89%	9.43%	14.17%
Portugal								
	Inflows		3.01%	2.19%	6.08%	13.69%	2.76%	9.84%
	Outflows		0.21%	0.19%	0.48%	0.86%	2.78%	7.48%
Spain								
	Inflows		2.46%	3.18%	6.19%	11.62%	5.33%	5.07%
	Outflows		0.61%	0.66%	0.79%	2.93%	3.14%	9.17%
Sweden								
	Inflows	1.47%	0.55%	1.00%	2.02%	4.01%	44.31%	32.94%
	Outflows	2.88%	3.01%	2.48%	9.30%	29.61%	33.81%	38.87%
Switzerland								
	Inflows				5.38%	8.03%	5.47%	11.33%
	Outflows				19.41%	10.31%	18.56%	35.82%
UK								
	Inflows	6.18%	6.84%	10.04%	6.54%	16.00%	11.06%	16.82%
	Outflows	6.97%	6.18%	11.15%	12.66%	9.60%	24.20%	28.84%
USA								
	Inflows	0.71%	0.91%	3.10%	2.55%	5.28%	4.91%	7.82%
	Outflows	3.70%	4.99%	3.52%	1.79%	4.04%	8.19%	7.87%

Source: OECD (1999d).

Table 4. Foreign Affiliates in the Manufacuring Sector

Percentage Share of Value Added, Wages and Salaries, and Investmet, Selected Years

	1992	1993	1994	1995	1996	1997
Czech Rep.				36.3	44.9	19.0
Value Added						3.3
Wages and Salaries						2.2
Gross Fixed Investment						
Finland*						
Value Added	7.8		8.9	9.7	12.6	13.8
Wages and Salaries	6.8		9.5	10.8	12.7	14.0
Gross Fixed Investment	6.2		9.2	8.2	6.5	7.8
France						
Value Added		28.7	27.2	30.0	30.4	
Wages and Salaries		26.3	25.2	27.1	27.7	
Gross Fixed Investment		30.5	28.3	32.1	30.8	
Hungary						
Value Added						68.3
Wages and Salaries		36.7	42.8	46.8	50.8	56.5
Gross Fixed Investment						
Ireland						
Value Added	69.5	70.8	73.7	76.9	77.1	
Wages and Salaries	49.6	49.8	52.1	52.6	52.0	
Gross Fixed Investment						
Netherlands				24.4	27.9	
Value Added				27.3	28.5	
Wages and Salaries				23.8	23.4	
Gross Fixed Investment				35.8	27.9	
Norway	9.8	13.5	14.8	22.2	16.7	
Value Added	8.1	9.2	10.4	19.5	18.6	
Wages and Salaries	8.4	9.1	10.0	17.0	16.8	
Gross Fixed Investment	9.8	13.5	14.8	22.2	16.7	
Sweden	14.6	14.1	14.4	20.4	20.1	
Value Added	18.3	17.0	15.6	21.2	21.8	
Wages and Salaries	18.3	17.0	17.2	21.6	21.4	
Gross Fixed Investment	5.5	13.2	10.0	9.8	10.3	
Turkey						
Value Added	10.7	13.4	12.9	14.7	15.4	
Wages and Salaries	8.1	9.3	9.8	12.6	11.9	
Gross Fixed Investment	5.5	13.2	10.0	9.8	10.3	
UK						
Value Added		24.3	25.6	32.6		
Wages and Salaries		21.9	22.5	21.5	23.4	
Gross Fixed Investment		29.7	30.5	31.8		

Source: OECD (1999b), country tables 4, 5, and 9.

Table 5. Foreign Population in European Countries

Foreign Population as Share of Total and Share Acquiring Nationality, in Percent

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Austria										
% of total population	4.5	5.1	5.9	6.8	7.9	8.6	8.9	9.0	9.0	9.1
% acquiring nationality	2.5	2.5	2.4	2.5	2.2	2.3	2.3	2.1	2.2	2.2
Belgium										
% of total population	8.8	8.9	9.1	9.1	9.0	9.1	9.1	9.0	9.0	8.9
% acquiring nationality				0.9	5.0	1.8	2.8	2.8	2.7	3.5
Czech Rep.										
% of total population					0.4	0.8	1.0	1.5	1.9	2.0
% acquiring nationality										
Denmark										
% of total population	2.8	2.9	3.1	3.3	3.5	3.6	3.8	4.2	4.7	4.7
% acquiring nationality	2.7	2.3	2.0	3.4	3.0	2.8	3.0	2.7	3.3	2.3
Finland										
% of total population	0.4	0.4	0.5	0.8	0.9	1.1	1.2	1.3	1.4	1.6
% acquiring nationality	6.0	8.1	4.2	4.7	2.3	1.8	1.2	1.1	1.4	2.0
France										
% of total population			6.3							
% acquiring nationality			2.7							
Germany										
% of total population	7.3	7.7	8.4	7.3	8.0	8.5	8.6	8.8	8.9	9.0
% acquiring nationality	1.0	1.5	2.1	2.7	3.1	3.1	3.8	4.5	4.2	3.7
Hungary										
% of total population							1.3	1.4	1.4	1.4
% acquiring nationality								7.3	8.8	6.1
Ireland										
% of total population	2.4	2.3	2.3	2.5	2.7	2.7	2.7	2.7	3.2	3.1
% acquiring nationality										
Italy										
% of total population	1.1	0.9	1.4	1.5	1.6	1.7	1.6	1.7	2.0	
% acquiring nationality				0.6	0.5	0.7	0.7	0.8	0.7	0.8
Lux.										
% of total population	27.4	27.9	29.4	30.2	31.0	31.8	32.6	33.4	34.1	34.9
% acquiring nationality	0.7	0.6	0.7	0.5	0.5	0.6	0.6	0.6	0.6	0.5

Netherlands										
% of total population	4.2	4.3	4.6	4.8	5.0	5.1	5.0	4.7	4.4	
% acquiring nationality	1.5	4.6	2.0	4.2	4.9	5.7	6.3	9.4	11.4	8.8
Norway										
% of total population	3.2	3.3	3.4	3.5	3.6	3.8	3.8	3.7	3.6	3.6
% acquiring nationality	2.7	3.4	3.4	3.5	3.5	3.6	5.4	7.2	7.6	7.6
Portugal										
% of total population	1.0	1.0	1.1	1.2	1.3	1.3	1.6	1.7	1.7	1.8
% acquiring nationality										
Spain										
% of total population	0.9	0.6	0.7	0.9	1.0	1.1	1.2	1.2	1.3	1.5
% acquiring nationality	2.4	1.6	2.8	1.3	1.5	2.1	1.8	1.5	1.7	1.9
Sweden										
% of total population	5.0	5.3	5.6	5.7	5.7	5.8	6.1	5.2	6.0	6.0
% acquiring nationality	4.5	4.2	3.7	5.7	5.9	8.5	6.9	6.0	4.8	5.5
Switz.										
% of total population	15.2	15.6	16.3	17.1	17.6	18.1	18.6	18.9	18.9	19.0
% acquiring nationality	1.2	1.0	0.8	0.8	1.0	1.1	1.1	1.3	1.5	1.4
UK										
% of total population	3.2	3.2	3.2	3.1	3.5	3.5	3.6	3.4	3.4	3.6
% acquiring nationality	3.5	6.4	3.2	3.4	2.4	2.3	2.2	2.0	2.2	1.9
US										
% of total population			4.7							
% acquiring nationality										

Source: OECD (1999c).

Table 6. Optimal Tax Rate on Mobile Factor (in percent)

Case A: Elasticity of Demand for Mobile Factor = 1						
Local Ownership	**Half-life of Adjustment Process (in Years)**					
Share	0.5	1	2	5	10	20
0.00	3.61	7.21	14.43	36.07	72.13	100.00
0.25	2.71	5.41	10.82	27.05	54.10	100.00
0.50	1.80	3.61	7.21	18.03	36.07	72.13
0.75	0.90	1.80	3.61	9.02	18.03	36.07
1.00	0.00	0.00	0.00	0.00	0.00	0.00

Case B: Elasticity of Demand for Mobile Factor = 1.33						
Local Ownership	**Half-life of Adjustment Process (in Years)**					
Share	0.5	1	2	5	10	20
0.00	2.71	5.41	10.82	27.05	54.10	100.00
0.25	2.03	4.06	8.12	20.29	40.58	81.15
0.50	1.35	2.71	5.41	13.53	27.05	54.10
0.75	0.68	1.35	2.71	6.76	13.53	27.05
1.00	0.00	0.00	0.00	0.00	0.00	0.00

Case C: Elasticity of Demand for Mobile Factor = 4.00						
Local Ownership	**Half-life of Adjustment Process (in Years)**					
Share	0.5	1	2	5	10	20
0.00	0.90	1.80	3.61	9.02	18.03	36.07
0.25	0.68	1.35	2.71	6.76	13.53	27.05
0.50	0.45	0.90	1.80	4.51	9.02	18.03
0.75	0.23	0.45	0.90	2.25	4.51	9.02
1.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Author's calculations, as explained in text.