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This chapter by de Mooij and Keen presents new evidence on two important and topical issues. The first is whether there is empirical support for the claim that "fiscal devaluations"—increases in value added tax (VAT) accompanied by reductions in employer contributions for social insurance—can generate a short-run increase in exports. For countries that operate under a fixed exchange rate regime with many of their trading partners, such as those in the Eurozone, this possibility—the use of tax instruments to achieve an outcome similar to an exchange rate devaluation—has attracted significant policy attention. The authors note that a number of European nations have adopted such policies in recent years. This chapter offers both a careful theoretical analysis of the effect of a fiscal devaluation, as well as new empirical evidence on how VATs and social insurance taxes affect net exports.

The second part of the chapter investigates the structure and revenue yield of current VATs, to assess the potential for generating additional revenue from these taxes without raising rates. The chapter focuses primarily on potential changes in the structure of the VAT. The authors present a very informative decomposition of the revenue collected by current VATs relative to the hypothetical revenue that could be collected if a tax at the statutory VAT rate were levied on all consumption. This provides a rough estimate of the revenue yield of base-broadening VAT reforms. Such reforms would be associated with only modest increases in the distortionary cost of the tax system, and in some cases might even yield efficiency gains. Both components of the chapter are well-executed and offer important new information on both the structure and the effects of VATs in OECD nations. My comments will focus on each component of the chapter in turn.

The analysis of fiscal devaluations begins by examining the theoretical basis for a link between fiscal devaluations and net exports. One of the key findings is that the effects of such policies are likely to depend substantially on the nature of the VAT increase that is used to offset the revenue loss associated with the drop in social insurance contributions. To summarize the key findings, recall that labor supply depends on the real after-tax product wage, $(1 - \tau)w/(1 + \theta)p$, where w is the nominal wage and p the nominal product price for output, while labor demand depends on the real wage facing the firm, inclusive of required social insurance contributions, $w(1 + \sigma)/p$. The tax parameters are τ, the income tax rate (which is included for completeness but is assumed to remain fixed), θ, the rate of VAT, and σ, the employer payroll tax rate. A revenue neutral fiscal devaluation reduces σ and raises θ.

The effect of a fiscal devaluation depends critically on the flexibility of

nominal wages. If nominal wages instantly adjust to the tax change, then the fiscal devaluation may not have any real effects. If nominal wages rise to offset the effect of higher consumer prices associated with the increase in θ, then $w(1 + \sigma)$ will remain roughly unchanged and there will be little effect on labor demand. There will be no effect if the VAT covers all goods in the economy, and if all goods are produced domestically using labor inputs that are affected by the change in social insurance taxes. After the rise in nominal wages, both the real after-tax product wage and the real cost of labor to the firm would be the same as before the fiscal devaluation.

The analysis becomes more complicated when there are imported goods, when nominal wages are sticky, and when labor in some sectors is not covered by the social insurance tax or output from some sectors is not covered by the VAT. The first part of the chapter carefully explores these issues. When nominal wages do not adjust immediately to the rise in consumer prices induced by the increase in VAT, the firm's real cost of labor declines when σ is reduced. Facing lower labor costs, the firm can reduce prices, increase output, and hire more workers. Foreign firms that compete with domestic firms will *not* benefit from the reduction in social insurance tax rates, but their goods will be affected by the increase in VAT, just as the domestic firm's goods will be. The net effect is an increase in the relative competitiveness of domestic producers vis-à-vis the foreign firms that produce imported goods. A parallel effect improves the competitive posture of domestic firms competing in markets abroad: reduced net-of-tax labor costs can be passed along in the form of lower product prices, thereby improving competitiveness. Because domestic firms are now more competitive both at home and abroad, one might expect an increase in aggregate net exports. The empirical work in this chapter is designed to quantify this.

One of the chapter's most important theoretical contributions is its demonstration that the scope of a nation's VAT is an important determinant of the effects of a fiscal devaluation. Most VATs only cover a fraction of consumption spending. They often exempt substantial sectors such as banking, education, and health. In such settings, an increase in the VAT rate exacerbates the efficiency costs associated with intersectoral distortions. In contrast to VATs, which usually have limited coverage, social insurance taxes generally cover a very high fraction of employees in most sectors, so a fiscal devaluation may be moving from a broader based to a narrower based tax. The importance of VAT structure in determining the effects of a fiscal devaluation parallels Feldstein and Krugman's (1990) emphasis on the limited coverage of the VAT in their discussion of how a shift from an income tax to a VAT would affect the tradable goods sector. Farhi, Gopinath, and Itskhoki (2011) explore related issues in the context of a VAT-replacing-social insurance tax reform. The current chapter shows that one of the few settings in which it is possible to make unqualified statements about the effect of fiscal devaluation is when the VAT applies to all goods at a fixed rate.

While the chapter focuses on the limited coverage of the VAT, in practice, one could also envision fiscal devaluations that involve a reduction in social insurance taxes for a limited set of firms. For example, policymakers might target the social insurance taxes on firms that are engaged in international trade, perhaps proxied by "manufacturing" or a similar set of broad categorical identifiers. Such policies would involve additional distortions across sectors because of the induced differences in social insurance tax burdens on labor, but they would permit a smaller increase in VAT to achieve revenue neutrality. There are many tax policies that target particular industries, such as reduced corporate income tax rates for firms in the manufacturing sector in the United States. It would be interesting to know more about the structure of reductions in social insurance contribution rates that have been associated with fiscal devaluations.

After presenting a careful theoretical analysis of fiscal devaluations, the authors develop new empirical findings on how net exports respond to changes in employer social insurance contributions and VAT. This analysis can be viewed as part of a broader agenda, which links macroeconomics and public economics, directed at understanding how tax policies affect the components of aggregate demand as well as overall economic growth. The authors focus on just one component of aggregate demand, and they recognize that there are a number of empirical challenges to the interpretation of aggregate time series regressions linking net exports to tax variables such as the change in the VAT rate and the change in the payroll tax rate.

One of the chapter's strengths is the use of a range of different strategies to assess the most important empirical problems. Throughout their analysis, the authors include in their estimating equations a standard list of explanatory variables that have been used in previous studies of the determinants of net exports. Even with this approach, however, and with the use of instrumental variables (statutory tax rates) for some of the aggregate measures of tax receipts, there remain some empirical issues that should be noted.

First, the problem of policy endogeneity could affect the empirical analysis in many ways. For example, a country that is trying to encourage exports might adopt a fiscal devaluation and at the same time adopt other policies designed to increase net exports. If the other policy measures are not reflected in set of explanatory variables that are included in the modeling, and if those measures matter, then the results may overstate the actual effects of the tax variables because these variables may be correlated with omitted variables that describe other policy actions. It is also possible for policy endogeneity to lead to understatement of the actual effects of fiscal devaluation. If countries that experience adverse shocks to their net exports are more inclined to adopt a fiscal devaluation, then the effect of the policy may be confounded by the coincidence of its adoption with the arrival of the adverse shock.

Policy endogeneity is difficult to address in a fully satisfactory fashion,

because there is little consensus on how best to measure the external shocks facing a nation or the full set of factors that may lead to the enactment of specific tax policies. The authors follow the standard strategy of using various instrumental variables, and as is often the case, the results are somewhat dependent on the specification. One strategy that future researchers might explore, to complement the approach taken in this chapter, is to identify episodes when social insurance tax rates or VAT rates were changed for reasons that were not related to concerns about the current account or macroeconomic performance more generally, and to study those episodes in detail. This strategy has been applied to the study of how income tax rates affect revenue and economic growth by Romer and Romer (2010).

A related endogeneity concern involves the measurement of tax variables. The authors devote substantial attention to this issue, and they present a range of empirical findings using different tax variables. The underlying problem arises because there is no single summary variable that can describe most modern complex tax systems. Even the simplest VATs have some exemptions and special rules for some goods and industries, and social insurance contributions often apply to only a subset of the employees in an economy. This means that a single statutory rate variable may not capture the full detail of the tax code. A standard alternative approach, which is to use the ratio of tax revenue from a particular source to GDP as the tax variable, suffers from another problem. Consider the use of the ratio (VAT Revenue – Social Insurance Tax Revenue)/GDP as a litmus test for fiscal devaluation; when this ratio rises, a country is pursuing that policy. The difficulty is that this variable may be affected by the overall level of economic activity. If the elasticity of wage income with respect to GDP differs from the elasticity of consumer spending in sectors that are covered by the VAT, then this ratio could also exhibit cyclical variability. If net exports also vary over the cycle, a measured correlation between the indicator for fiscal devaluation and net exports could be a manifestation of the underlying correlations between the tax shares, net exports, and GDP, and not the result of a causal link from fiscal devaluation to net exports.

The authors attack this problem in three ways: they include measures of aggregate economic activity in their list of control variables, they use cycle-adjusted measures of revenue as a share of GDP, and they present robustness results using tax rates rather than total revenue scaled by economic output as the indicator of tax policy stance. The results, presented in table 11.1, show that the estimated link between tax variables and net exports is sensitive to the tax measurement issue. In particular, the standard errors of the estimated coefficients are substantially smaller when the cycle-adjusted variables are used in place of the simple tax-to-GDP ratios, and the coefficient estimates when the tax rate variables are used are quite different from those with either revenue share of GDP.

Which estimates should be viewed as the benchmark results? My preferred

specifications are those using the cyclically adjusted tax-to-GDP ratios to capture tax policy. These variables reflect the breadth of the tax base as well as the rate structure, and they allow relatively flexible control for the differential elasticity of the tax bases for different tax instruments. The results using these variables suggest that reductions in the social insurance contribution rate have a statistically significant and positive effect on net exports, with a larger effect in countries that are part of the Euro area. These findings are consistent with the theoretical framework that is developed at the start of the chapter. The effects of increases in the VAT on net exports are less well determined, and in most specifications the point estimates are insignificantly different from zero. This means that when these findings are used to evaluate the policy experiment of raising the VAT and lowering the social insurance contribution, most of the impact is flowing through the estimated effect of social insurance contributions.

The empirical findings are generally supportive of the potential for fiscal devaluations to raise net exports. Because the estimating equations include lagged values of net exports, they also generate adjustment paths that offer some insights on the decay rate of the real effects of these tax policy changes. Here, the findings are a bit surprising: a half-life of over six years in countries that use the euro, and about three years in other nations. It would be interesting to compare the implicit speed of nominal adjustment in wages that these estimates imply with results from the literature that focuses on wage determination. Because tax policy shifts are relatively discrete events, one might expect that nominal wages would adjust more rapidly to these shocks than to other shocks. Moreover, there is little role for learning in response to tax changes, while if one is trying to examine how other macroeconomic shocks might affect nominal wages, it may take some time for labor market participants to disentangle the underlying shock that they need to respond to from the background noise in economic activity.

One issue that the chapter notes only in passing is the role of policy coordination across nations in affecting the impact of a shift from social insurance taxes to a VAT. A fiscal devaluation is likely to have a larger effect when one country adopts this policy in isolation than when there are a number of countries pursuing similar fiscal devaluations in tandem. While the chapter does not attempt to assess the extent to which coordinated action reduces the impact of this policy, the coincidence of policy actions in a number of European nations during the last few years suggests that it might be possible to investigate this issue. A first pass would include measures of the policy actions in a country's major trading partners in the empirical analysis, although given the difficulties in teasing out the effect of domestic policy actions, identifying the effect of actions in other nations is probably a tall order.

The second part of the chapter examines the efficiency cost of current VATs and the potential to raise more revenue, at lower incremental efficiency

cost, by reforming the VAT base. The authors bring together data from a range of different sources and develop a simple and revealing measure of the operation of the VAT: the C-efficiency ratio. This is the ratio of the revenue that is currently collected using the VAT and the revenue that would be collected if the VAT rate was applied to all consumption spending. For most countries, this ratio is around 0.50, which suggests substantial opportunities to raise additional revenue by broadening the VAT base. There is also substantial disparity across countries in the C-efficiency ratio, with Italy and Greece below 45 percent, Luxembourg at 89 percent, and Ireland, Austria, and Denmark all above 60 percent.

The authors emphasize the insight that raising the VAT rate on the existing base increases distortions between goods, while expanding the VAT base reduces these distortions. While these distortions are likely to be difficult to estimate because they depend on many parameters in consumer demand systems, in some cases the distortions may be quite substantial. The insight that there may exist ways to expand VAT revenues with a modest efficiency cost could have important implications for policy design. The chapter not only provides statistics on the C-efficiency ratio, but it also decomposes this ratio into a factor that is the result of tax evasion, and a factor that is the result of a narrow tax base. This decomposition, which again shows significant variation in the contributions of these two factors across nations, provides a road map for potential policy reform.

The discussion of expanding the VAT base also addresses the important question of whether a broad-based VAT would fall more heavily on lower-income households than a narrower VAT that excludes necessities such as food, medical care, and housing from the tax base. The authors suggest that the VAT should not be considered as a fiscal instrument *in isolation,* but rather should be recognized as one component of a broader fiscal matrix. This implies that distributional effects associated with a change in the VAT base may be offset by changes in other policies, particularly income taxes. This is a point of great importance for practical tax analysis, and it also connects with a long theoretical literature on optimal tax design. When the VAT is part of a tax system that also includes an income tax, policymakers have multiple instruments that can be used to achieve their redistributive objectives. Atkinson and Stiglitz (1976) and Kaplow (2010) are two examples of analyses that demonstrate theoretically that in a broad set of economic environments, attempting to achieve distributive goals by modifying a VAT is less efficient than levying a flat-rate consumption tax along with an income tax that addresses distributional objectives.

The authors note, however, that the economic analysis of the choice between an income tax and a narrow consumption tax may not capture the full set of political economy considerations that arise in practical policy design. In particular, if it is easier for politicians to change income tax rates than to alter the base of the VAT, then those who are concerned about

regressive taxes may oppose VAT base broadening, even when accompanied by income tax reform, because they fear that the income tax policy will be reversed in the future. This alone is an interesting topic for future work: the degree of commitment that is associated with different types of tax policies, and whether this affects popular support for different policy actions.

In conclusion, this chapter offers a very insightful analysis of the role of tax policy instruments in achieving macroeconomic policy objectives. While the authors focus on how fiscal devaluations affect net exports, the analysis could be expanded in at least two directions. One is to consider the impact of tax policy more generally on economic growth. Daveri and Tabellini (2000) is one example of a study that explores the link between labor income taxes, particularly social insurance contribution rates, and long-term economic growth and real per capita GDP. It concludes that high and rising labor income tax rates, including social insurance contribution rates, slowed economic growth in Europe during the latter part of the twentieth century. At a time when stronger economic growth can make an important contribution in reducing the burden of fiscal consolidation, there is likely to be growing attention to tax policy and growth. As the analysis in this chapter illustrates, however, there are substantial empirical challenges in developing convincing evidence about these linkages.

A second direction for future work is to move beyond the analysis of fiscal devaluations and to consider a broader range of tax policies that might achieve macroeconomic policy objectives. There are many settings in which taxes can alter relative prices, either across sectors or over time, and thereby induce various behaviors that matter for aggregate economic activity. Feldstein (2002) and Hall (2011), for example, discuss the potential for a preannounced set of VAT increases to encourage current consumption by operating as an alternative to a monetary policy that supports inflation. Just as this chapter focuses on how tax policies may substitute for exchange rate policy, there may also be ways for tax policy to augment or replace monetary policy in some dimensions.

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