Economic integration and government size: a review of the empirical literature

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FINANCIAL THEORY AND PRACTICE
35 (3) 327-384 (2011)

Abstract

This paper reviews the empirical literature concerning the impact of economic integration on the size and the composition of the public budget. From a theoretical perspective, a pessimistic view highlights the threat that economic integration constitutes to the action of the public sector. An optimistic view, instead, emphasizes the beneficial effects of integration in stimulating efficiency – enhancing public policies. Despite some well-established theoretical results, the empirical evidence on this topic is rather controversial. Some studies support the hypothesis that taxes and public spending may increase in order to compensate losers for the risks of a more open economic environment. Other studies support the opposite idea, that the public sector retrenches when having to face increasing mobility of the production factors. Yet, comparability of the wide empirical evidence on the topic is not straightforward and empirical regularities are hard to find.

Keywords: tax revenue, public spending, government size, trade openness, capital openness, economic integration, globalisation

1 INTRODUCTION

There is widespread evidence that the degree of economic integration has climbed in recent times. According to the data released by the World Trade Organization, the world ratio between the sum of imports and exports over GDP has more than doubled since the beginning of the seventies, moving from just above 21 per cent of GDP to more than 52 per cent in 2006. This growth – even though at different starting levels – has characterised almost all countries in the world, and it has been faster for smaller countries and in the most recent years.

This generalised upward trend of trade integration has an even more buoyant counterpart on the side of the foreign direct investments (FDI). Even though *levels* of FDI represent a smaller share of GDP – contrasted to trade – their *changes* have been extremely rapid since the nineties for a large number of countries in the world. On average, the world flows of FDI are now six times as great as they were at the beginning of the seventies. But in many countries, the flows originating between 1996 and 2006 represent more than 60 per cent of the total flows measured since 1970, mainly as the result of deliberate choices to liberalise capital movements.[1] These indicators would not only suggest that a growing portion of the economic activity is carried out across borders; they also provide two further insights. First, that a significant part of this activity is associated to capital flows rather than to trade flows, an issue – we will see below – that is often overlooked by the existing empirical literature (Grunberg, 1998; Kimakova, 2009); second, that the impact of economic integration can be largely "concentrated" in most recent times.

[1] As in the case of trade, capital markets flourished as early as the late 19th and early 20th century, even though, according to some observers, "beginning in the late 1950s, …, private international financial activity increased at a phenomenal rate" (Helleiner, 1994).

FINANCIAL THEORY AND PRACTICE
35 (3) 327-384 (2011)

Following this mounting *global* foreign exposure of many countries, a large strand of literature has started to focus on whether economic integration may affect the size and the composition of national tax and spending policies.[2] A first view claims that economic integration introduces an imbalance between national-sized public sectors and international-sized markets. Since nations are becoming smaller in size than the markets they try to tax and/or regulate, national public policies face serious implementation issues (Hülsemeyer, 2004). In this scenario, mobility makes tax bases disappear or forces governments to use fiscal resources efficiently, because, for example, the exploited tax bases might *exit* national borders when inefficiently taxed (a process known as the *efficiency hypothesis*).[3] In both cases, the pessimistic view prevails that economic integration represents a direct threat to the tax-raising ability of the states. In turn, this may have consequences to both the level and the composition of public spending, especially when governments are tied to a budgetary balance or are constrained in the use of public debts. Those who oppose globalisation suggest that citizens would be harmed by national "*welfare retrenchments*" or by non-selective reductions of the *supply* of public spending, especially in those fields where either the private sector does not complement the absence of the public provision or alternatives are scarce or not affordable.[4] In all cases, the most likely effect would be a shrinking of the size of the public sector, a reason to group these possible outcomes under the broad heading of the "*shrinking hypothesis*" (SH).

A second view claims that globalisation may instead encourage an *increase* of tax revenues or public spending. This would occur in order to cope with fast economic changes (Grunberg, 1998), to manage the increased risk that economic integration entails (Rodrik, 1998) and to compensate the increased income volatility or insecurity associated to liberalisation of trade and capital flows (Rodrik, 1998; Katsimi, 1998 and 1999). These theories emphasize the role of the *demand* side, i.e. the possibility that the *losers* in the globalisation process may drive some compensatory public intervention. For this reason, these possibilities are often grouped under the heading of the "*compensation hypothesis*" (CH).[5] Compensatory spending, however, may not be of the same homogenous nature. *Individuals*,

[2] In what follows, "globalisation" will be sometimes used as synonymous with economic integration, disregarding all other social, sociological and political dimensions of this term.

[3] As argued by Helleiner (1994:116), in the 70s American liberals supported the removal of capital controls on the ground that international financial markets would have disciplined government policy and forced states to adopt more sound fiscal and monetary programs. On the one hand, there was, at that time, the widespread opinion that abolishing capital controls would have forced public policies to take some distances from the Keynesian paradigm so far arguing in favour of autonomous interventionist welfare policies. The implicit belief was that governments were overtaxing and/or overspending, at least above the level preferred by advocates of liberalisation of financial markets.

[4] Garrett and Mitchell (2001:151) argue that "if the policies and institutions of which the financial markets approve are not found in a country, money will haemorrhage unless and until they are. In turn, financial capital is usually thought to disapprove of all government policies that distort markets, and welfare state programs are among the most prominent villains".

[5] These theories are mainly developed by looking at the expenditure side of the public budget, but the case where the tax revenue increases in response to external pressures can be interpreted as a *tax version* of the compensation hypothesis.

FINANCIAL THEORY AND PRACTICE
35 (3) 327-384 (2011)

especially if their mobility is low, would be more oriented to demanding additional income transfers and social welfare expenditures to cushion the adverse impacts of economic integration (lower wages, increased risk of unemployment, income volatility, uncertain future incomes, etc.). *Firms*, instead, would be more oriented to demanding privately productive public goods like infrastructures, training programmes, and human capital formation to persuade them to refrain from using the exit option (e.g. Taylor-Gooby, 1997; Heinemann, 1999). These two typologies of demands, however, impinge on different sectors of public expenditures, they are affected by different veto points in advanced economies (Hallerberg and Basinger, 1998) and are therefore likely to produce redistributive impacts.

Thus, according to some authors, public finances would be trapped into a *fiscal squeeze* (Grunberg, 1998). Additional public spending would compensate *losers*, while the ability to raise tax revenue would weaken the satisfaction of the *winners*. These two opposing forces may give rise to a general atmosphere of *permanent austerity*, as suggested by Pierson (2001). Also, public spending would be squeezed between what is demanded by the most mobile players in the globalisation process (firms) and what is on the contrary required by the least mobile factors (individuals). If the former command a premium in shaping the composition of public spending, an increase of public spending will not necessarily occur in the direction prescribed by the standard compensation hypothesis.

This discussion suggests that the net effect of globalisation may be controversially defined from both a theoretical and an empirical perspective. As suggested by Genschel (2004), the contemporary presence of both upward and downward pressures on public finance variables might explain why many quantitative studies record only a small net effect of globalisation. It is to the analysis of empirical studies that we now turn, to understand whether a(n) (almost) conclusive answer can be drawn in favour of either CH or SH. To this purpose, the focus will be on those empirical studies having (mainly) the following characteristics: (a) the use of econometric methods that include at least one indicator of economic integration (either trade or capital integration or both); (b) a measure of government size as dependent variable (either on the tax or on the spending side); (c) a cross-country analysis in a time-series framework.

Studies will be distinguished according to whether they investigate the relationship between economic integration and the size and composition of tax revenues (section 2), or whether they study the relationship between economic integration and the size and composition of public spending (section 3). To best interpret and discuss the main results, a series of tables will show studies in chronological order describing, for each case, the number of countries involved, the coverage period, how the dependent variable has been measured, how trade and capital integration are approximated, the impact they are most likely to have on the chosen measure

FINANCIAL THEORY AND PRACTICE
35 (3) 327-384 (2011)

of government size, and the econometric method used. The last column – for each empirical exercise – will attempt to classify results according to which hypothesis (between CH and SH) is supported most.

2 ECONOMIC INTEGRATION AND THE SIZE AND COMPOSITION OF TAX REVENUES

The impact of economic integration on tax revenues has its main root in the literature on tax competition. This theory has for many years pointed out that governments may hardly increase the tax burden on mobile tax bases (Gordon, 1986; Bucovetsky and Wilson, 1991; Razin and Sadka, 1991; Tanzi, 1995), predicting a lower level of total tax revenues in more economically integrated countries. In an extreme version of this theory (*harmful* tax competition), mobility would reduce the ability of any country to raise tax revenue and to finance public spending (Lee and McKenzie, 1989; Kurzer, 1993; Steinmo, 1994; Tanzi, 1995);[6] at the same time, autonomous fiscal policies would be undermined, giving the markets the option to be "beyond politics".[7] In a milder version of the same theory, inefficient taxation would be discouraged, as mobile tax bases will search for the most favourable (and efficient) tax system.

This *aggregate* response of the tax revenue, however, may be the result of a variety of outcomes that also qualify the shrinking hypothesis. To some extent, a *reduction* of the total tax revenue – *ceteris paribus* – can be interpreted as a sufficient condition to support SH, yet not a necessary one. Since economic integration is expected to have a greater impact on the most mobile tax bases, consistent results with SH should predict a negative relationship between economic integration and the *level* of *corporate* (or *capital*) taxation. At the same time, if this loss of tax revenues is recovered by increasing taxation on less mobile tax bases (e.g. labour, immovable properties, consumption, etc.), SH may also be consistent with a positive co-variation of economic integration and taxes on labour, consumption, or on incomes from immovable properties. In turn, this implies that consistency with SH can also arise through a reduction of the *ratio* between corporate and capital taxes (on the one hand) and less mobile tax bases like labour and consumption (on the other hand). If different taxes move in opposite directions, the absence of a net effect on the *level* of *total* tax revenues may be concealed by *composition* effects

[6] It is just worth recalling Adam Smith's (1776 [1976:848-849]) quotation that "the … proprietor of stock is properly a citizen of the world, and is not necessarily attached to any particular country. He would be apt to abandon the country in which he is exposed to a vexatious inquisition, in order to be assessed a burdensome tax, and would remove his stock to some country where he could, either carry on his business, or enjoy his fortune at his ease … not only the profits of stock, but the rent of land and the wages of labour, would necessarily be more or less diminished by its removal".

[7] This possibility, for example, was clearly recognised in the mid-seventies in Great Britain at the time of the speculation against the pound. The efforts made to protect policy autonomy from speculative flows by the Labour government eventually led to "the end of Keynesian society in Britain" (Krieger, 1986:57-58). But also the difficulties faced by the French government at the beginning of the 80s, in fighting speculation against the franc, were one of the main reasons of the failure of pursuing "Keynesianism in one country" (Helleiner, 1994). The definition of the Euromarket in the sixties, given by Wriston (1986), as a "stateless financial market" used to roundtrip capital controls is another example of what is meant by markets beyond politics.

FINANCIAL THEORY AND PRACTICE
35 (3) 327-384 (2011)

that are perfectly consistent with SH.[8] Results with an opposite sign will instead support a taxation version of CH, under the hypothesis that additional spending should be at least partly financed by additional taxes.

In what follows, we will focus on studies that consider both aggregated and disaggregated measures of the tax burden, even though few studies use *aggregate* measures (table 1). It is worth anticipating that of 63 empirical results, only 18 cases can be classified as supporting the compensation hypothesis. Thus, the main lesson we will get from table 1 is that a downward pressure on tax revenues from the most mobile tax bases is more than a theoretical curiosity. In most cases, economic integration has an impact on both the *levels* of corporate and capital taxation and on the *composition* of tax revenues, predicting a shifting of the tax burden towards labour and consumption that is consistent with the shrinking hypothesis.

2.1 TRADE AND CAPITAL OPENNESS

There is almost universal agreement on measuring trade openness as the sum of exports and imports over GDP (some exceptions are in Quinn, 1997; Stewart and Webb, 2003; Slemrod, 2004; Dreher, 2005). On the other hand, there is much more uncertainty about how to measure capital openness properly and whether to measure it by quantitative or qualitative indicators. This latter measure is most commonly approximated by capital inflows and outflows; or by dummy variables for restrictions on capital mobility; or by indices of financial restrictions on payments and receipts of capital; or by the absolute covered interest rate parity. Even though both trade and capital openness are often used as interchangeable concepts, in our view capital openness more satisfactorily approximates the degree of mobility of production factors. Highly capital-integrated countries may potentially experience large outward and inward flows of funds and significant de-localization of production factors, while it is not necessarily the same for highly trade-integrated countries where flows of merchandises can in principle be associated with a relative stability of production within national boundaries. While trade openness does not necessarily require production factors to move, capital openness, instead, might entail tax bases, moving quickly out of national borders.[9]

Nevertheless, the role of capital openness has been often underemphasized in empirical analysis. One reason can be traced back to Cameron (1978), who investigated the relationship between trade openness and the *change* of the overall tax revenues. In particular, he found that openness in 1960 was a strong predictor of

[8] A negative relation between economic integration and the ratio between capital and labour taxes may also suggest that either capital taxes decrease more or that they increase less than labour taxes; both outcomes are still consistent with the theory of tax competition.

[9] As argued by Grunberg (1998), trade taxes in the protectionist era "have always been a privileged revenue-raising device for developing countries…and even for industrial countries at early stage of development such as the United States in the 19th century". Ending protectionism in trade has therefore had costs in terms of forgone revenue not because tax bases have disappeared from countries but because of a deliberate choice of not taxing merchandise flows. But Rodrik too (1998:1009) noted that "trade itself may be a convenient tax handle for governments in poor countries that have difficulty raising taxes from other sources".

the increase of government tax revenues between 1960 and 1975 in 18 OECD countries. But in Cameron (1978) almost all countries included in the analysis had capital controls in place, making it irrelevant to control for capital openness. It is somewhat surprising that this point has not been fully appreciated by the subsequent literature on the topic, which is still focused mostly on trade openness as the main external determinant of government size. Slemrod (2004) is an important example in this direction; this paper provides intriguing evidence about the effect of economic integration on corporate taxation – a negative relationship with statutory corporate tax rates and a positive one with tax revenues as a fraction of GDP – but no measure of capital integration is included to control for this outcome. It is therefore not particularly surprising that the econometric specification gives an outcome where more trade-intensive countries collect more corporate taxes (thus supporting CH), but the issue of whether more capital integrated countries may actually do the same is left unanswered.

But is CH a general outcome of studies using taxation as a measure of government size? On the side of *trade openness*, among the 24 studies and 66 cases surveyed in table 1, 61 include a measure of trade openness, but only in eight cases does the coefficient of trade openness strongly support CH (Cameron, 1978; Huber et al., 1993; Garrett, 1995; Quinn, 1997; Garrett and Mitchell, 2001; Swank, 2002; Slemrod, 2004; Dreher, 2005). Only four of the previous studies also include a measure of capital openness (Garrett, 1995; Quinn, 1997; Swank, 2002; Dreher, 2005), but only in two cases does the coefficient of capital openness also support CH (Quinn, 1997; Dreher, 2005). Even after including those studies giving overall uncertain results – but some evidence of a positive coefficient of trade openness (Krogstrup, 2003; Haufler et al., 2006; Bullmann, 2008) – the total number of cases that supports CH on the trade side remains low. It is worth noting that in almost all cases the period analysed does not extend over 2000. As will be discussed below, this may limit the ability of data to capture the most recent (and to some extent the most important) characteristics of the integration process. Furthermore, both in Quinn (1997) and in Dreher (2005), the country coverage is wider than in other studies and this may suggest that the size of the sample can also be a relevant factor in shaping results. Yet, in Dreher (2005), the results change if the dependent variable used is the adjusted statutory tax rate on capital proposed by Devereux and Griffith (2003) instead of the standard effective tax rate on capital, pointing to the dependent variable as another potential important factor of influence.

On the side of *capital openness*, 50 out of 66 cases include either a qualitative or a quantitative measure, but independent support for CH is found only in 10 cases, regardless of the specific sign of the coefficient of trade openness (Quinn, 1997; Rodrik, 1997; Swank, 1998; Garrett and Mitchell, 2001; Swank, 2002; Swank and Steinmo, 2002; Dreher, 2005). Under this perspective, it emerges that the compensation hypothesis is a far from general result even within its original "trade" envi-

FINANCIAL THEORY AND PRACTICE
35 (3) 327-384 (2011)

ronment. Paradoxically, there is a greater number of cases where the coefficients of both trade openness and capital openness independently support SH (18 cases both for trade and capital), as can be appreciated from table 1. This preliminary investigation casts some doubts on the power of the compensation hypothesis, at least with regard to the compensating role of taxation here explored.

2.2 CORPORATE AND CAPITAL TAXATION

An important qualification of the previous results is about what measure of the tax burden actually supports either CH or SH, and what regularity can we find. Measures of the dependent variable have become increasingly sophisticated since the time of the pioneering contribution by Cameron (1978), where a "crude" ratio between the change of the overall tax revenues and GDP was used. Actually, among the 24 studies of table 1, only four other studies use a comprehensive measure of taxation, including total tax revenues usually normalised over GDP (Huber et al., 1993; Heinemann, 1999; Swank, 2002; Bullmann, 2008). In these cases, however, there is no regularity in the outcome (CH or SH). Interestingly, in the three cases where a measure of capital openness is introduced (all with the exception of Huber et al., 1993), the sign of the corresponding coefficient is in favour of SH.[10]

In the other cases, the measures of the tax burden range from *statutory* tax rates (Swank and Steinmo, 2002; Devereux et al., 2004; Slemrod, 2004) to *forward-looking* or *backward-looking effective* tax rates, to measures of tax burden based on *tax ratios* (Bretschger and Hettich, 2002; Krogstrup, 2003; Winner, 2005; Haufler et al., 2006; Adam and Kammas, 2007; Schwartz, 2007).[11] To highlight the most valuable results descending from the use of this variety of dependent variables, it is worth starting from the most effective test of the compensation hypothesis on the tax side, by observing what happens to *corporate* and *capital* taxation.

With regard to *corporate taxation* (variously defined), the trade openness version of CH is hardly supported, with only 5 cases out of 24 (distributed among three studies: Quinn, 1997; Swank, 1998; Slemrod, 2004). The particular feature of the previous three studies is that in Quinn (1997) support to CH is found on both the trade and the capital side; in Swank (1998), instead, the same support comes only from the capital side; finally, Slemrod (2004) provides one case for a strong positive impact of trade openness on the ratio between corporate taxes and GDP without including any measure of capital openness.[12] This leaves some uncertainty on what the proper measure of economic integration is. In most of the other cases, instead, the relation is negative, supporting SH on either the trade or the capital side (Swank, 1998; Heinemann, 1999; Bretschger and Hettich, 2002; Swank and Steinmo, 2002; Krogstrup, 2003; Slemrod, 2004; Adam and Kammas, 2007; Schwarz, 2007). This result is consistent with the view that, as corporate taxation

[10] Note that Heinemann (1999) obtains this result by using a cluster analysis.
[11] For a detailed treatment of this issue, see Gastaldi (2008).
[12] Note however that if the dependent variable (statutory corporate tax rate) is changed, the results may support SH.

is one of the most mobile tax bases, increasing taxes on corporations on an open environment may lead them to move or to de-localize production and/or profits in places with more advantageous tax rules.

With regard to *capital taxation*, a warning is necessary before investigation of the results. Most of the empirical studies do not distinguish between capital taxes falling on immobile and mobile tax bases (Gastaldi, 2008 provides an exception). This means that the sign of the relationship could not fully capture the potential mobility of the tax base. Yet, among the 14 studies using measures of capital taxation, only 5 five cases support the compensation hypothesis, one on the side of trade openness (Garrett, 1995), the other on the side of capital openness (Rodrik, 1997; Garrett and Mitchell, 2001; Swank, 2002; Dreher, 2005). Explicit support to SH, instead, comes from Rodrik (1997) – for trade openness – Krogstrup (2003), Dreher (2005), Winner (2005). It is interesting to note that where taxes on mobile and immobile capital are disentangled (Gastaldi, 2008), support to SH is identified only in the former case, while effective tax rates on immobile capital do not share any relationship with economic integration. Thus, it seems that the approximation of factor mobility provided by capital integration is the most promising route to the understanding of the impact of economic integration. This would imply that studies using *capital* taxes without introducing this distinction may not be sufficiently informative and must therefore be assessed with caution.

Further insights may come from those studies that contemporaneously show economic integration to have a *negative* (*positive*) relationship with corporate or capital taxation and a *positive* (*negative*) relationship with either labour or consumption taxation. In the case of the *negative-positive* combination, downward pressures on taxes falling on mobile tax bases and upward pressures on taxes falling on immobile ones, may give rise to a composition effect consistent with the shrinking hypothesis. *Negative-negative* combinations would also be consistent with SH. *Positive-negative* combination would instead be consistent with the compensation hypothesis, as would *positive-positive* combinations. Unfortunately, there are few studies dealing at the same time with different effective tax rates on various tax bases, and – with the exception of Quinn (1997), and Garrett and Mitchell (2001) – they almost always support SH, suggesting again hard times for the compensation hypothesis (Rodrik, 1997; Swank, 1998; Heinemann, 1999; Bretschger and Hettich, 2002; Swank and Steinmo, 2002; Krogstrup, 2003; Adam and Kammas, 2007; Gastaldi, 2008).

2.3 PERIOD AND COUNTRY COVERAGE

As a matter of further complication in searching for empirical regularities, the variety of outcomes so far discussed relies on contexts that are not strictly comparable. The complexity of table 1 reveals that results are in some cases period-dependent, country-dependent and method-dependent (for this latter case, see, in particular, Bretschger and Hettich, 2002; Winner, 2005), yet without any signifi-

cant regularity. Two points are worth noting. First, studies differ widely with regard to the *country coverage*. While in almost all cases the analysis is based on a time-series cross-section context, countries included differ in number and, more important, by geographical areas. Most of the analyses involve OECD countries, one analysis is confined to European countries (Krogstrup, 2003), while others refer more generally to a set of developed or advanced democracies (Huber et al., 1993; Swank, 1998; Swank, 2002; Swank and Steinmo, 2002; Beauchamp and Montero, 2005). Very few studies extend over a large number of countries including transitional and less developed ones (e.g. Quinn, 1997). When OECD countries are stated to be used – 14 studies for a total of 55 cases – there are only 6 cases where the compensation hypothesis is supported, which makes CH a far from general case also for that group of countries.

Period coverage might also be conditioning, as the temporal evolution of trade and capital openness has been extremely differentiated in the last decades. The number of years covered is only rarely updated to very recent times, including in recent studies, mainly reflecting the temporal lag in the availability of data. Most of the empirical evidence stops around the first half of the nineties; another set of studies do not go beyond 2000. In both cases, capital liberalisation cannot have fully explained all its effects, as many countries have abolished capital controls in those periods, especially in Europe. This may especially affect the outcome of those studies using OECD countries, of which European countries are a large subset. In this regard, the chronological order of table 1 indeed suggests that the frequency of CH in the last two columns is lower when moving to more recent studies, where the datasets used extend to years potentially more characterised by a higher degree of mobility induced by economic integration.

2.4 ECONOMETRIC ISSUES

There are finally some econometric issues that merit consideration, even though regularities between econometric methods and outcomes do not easily emerge. This is also due to the fact that not all studies give full details of the econometric framework, especially with regard to the treatment of some specific issues like heteroskedasticity, autocorrelation within panels and cross-sectional correlation that are fundamental features of the panel data analysis. There are also few studies addressing the stationary (or non-stationary) nature of the variables. The importance of stationarity cannot be overlooked, as using variables that are stationary only in first differences may cause results to diverge when levels or changes of both government size and economic integration are used. Unfortunately, there are not many studies using the dependent variable in differences. Besides the pioneering contribution by Cameron (1978) – supporting CH – only Hallerberg and Basinger (1998) and Bullmann (2008) use changes of the dependent variable. Incidentally, the latter contribution adopts this strategy to replicate the analysis by Cameron (1978). But in both cases, support to CH is denied on both the trade and the capital side. Furthermore, control for co-integration of variables is almost ab-

FINANCIAL THEORY AND PRACTICE
35 (3) 327-384 (2011)

sent. As far as we understand, the only case is Stewart and Webb (2003), where only modest evidence is adduced that corporate tax burdens move together across countries in the long run in response to increased economic integration.[13]

3 ECONOMIC INTEGRATION AND THE SIZE AND COMPOSITION OF PUBLIC SPENDING

On the spending side, Cameron (1978) explicitly pointed out that more open countries tend to be more unionised, with collective bargaining leading to greater demand for social protection accommodated by increasing tax revenues. Yet, *public spending* variables were not directly involved in the econometric investigation. But the lesson that most economists have learned from that contribution is that citizens will *demand* more public spending in response to higher levels of *trade* openness, especially after Rodrik (1998) reappraised the issue.

While challenging the collective bargaining explanation, Rodrik argued that government spending might serve as an indirect insurance against external (and undiversified) risk. His most influential result was the *positive* association between government consumption and trade integration in a large sample of countries that qualifies openness both as a determinant and as a predictor of government consumption levels across countries (Rodrik, 1998:1004).[14] This conclusion would suggest a strong complementarity between markets and governments, with a more powerful role for government consumption in those economies that are subject to larger external risks.

To what extent can this result be assumed to have general validity in the context of public spending? Critics of this position have often pointed out that additional public spending would necessitate additional tax resources. While this task could not be easy in a highly trade-integrated economy, it may become an even more difficult one in capital-integrated economies, especially when capital mobility leads to higher tax base volatility. The results summarised in the previous section in the case of capital and corporate taxation suggest that conclusions about the possibility of expanding tax levels cannot be taken for granted. The common paradigm is that higher taxes or higher debt promoted to accommodate additional public spending would encourage capital to flow across national borders, reducing available tax resources. Under these conditions, trade openness would tell only part of the story of economic integration, with capital openness becoming, instead, of mounting relevance. Thus, the common increasing trend to capital and financial openness makes it less and less justified to disregard the capital side of economic integration when moving to recent times. Diverging from some current interpretations (e.g. Shelton, 2007), we argue that capital openness associated with tax base volatility would facilitate an across-the-board reduction of public

[13] Note that Stewart and Webb (2003) do not use an econometric strategy, but a bivariate and multivariate cointegration analysis.

[14] In Rodrik (1998), a measure of the risk involved in higher economic integration was approximated by the product between volatility of terms-of-trade and trade openness.

FINANCIAL THEORY AND PRACTICE
35 (3) 327-384 (2011)

spending, with country-specific exceptions depending on country-specific political attitudes.[15]

How has the existing empirical evidence dealt with this issue? In what follows, we will focus on those studies that consider aggregate measures of public spending (mainly *total spending* or *government consumption*) while leaving to a separate sub-paragraph the analysis of those studies that consider narrower categories of public spending and the corresponding composition effects. Following the structure of the previous paragraph, it is worth anticipating that among the 29 studies considering *aggregate measures of government spending*, for a total of 60 empirical cases, only 15 can actually support CH. Furthermore, while 12 of them support CH on the side of trade openness, only 3 cases can support CH on the side of capital openness. Finally, within the studies that use *categories of public spending*, there is an impressive number of them showing no or an uncertain relationship. In the case of trade integration, they amount to 47 out of 85; in the case of capital integration, the ratio is 37 out of 59.

3.1 TRADE OR CAPITAL OPENNESS?

As in the case of taxation, there is almost universal agreement on measuring trade openness as the sum of exports and imports over GDP. On the other hand, there is much more uncertainty about how to measure capital openness properly. Thus, in this particular set of studies (that use either *total spending* or *government consumption* as a dependent variable), it may not be fortuitous that the compensation hypothesis is most supported when a control for capital openness is omitted (table 2). This happens (in all or some cases) in Swank (1988), Alesina and Wacziarg (1998), Islam (2004), Hays et al. (2006), Rickard (2007), Garen and Trask (2005), Epifani and Garcia (2005), and Ram (2009). In our view, the fact that these studies do not include any measure of capital integration – and therefore leave unanswered the question of whether capital flows (or even stock) may have an impact on public policies – is crucial.

When this inclusion occurs, the conclusions drawn on the side of trade openness are much more controversial. One can distinguish three cases, according to the sign of the coefficient of capital openness. First, in almost all cases where capital openness bears *no relation* with government size, the sign of trade openness is either not significant or negative (Rodrik, 1997; Iversen and Cusack, 2000; Garrett, 2001; Burgoon, 2001; Garrett and Mitchell, 2001; Hanson and Olofsdotter, 2005; Dreher, 2005; Kittel and Winer, 2005; Gemmell et al., 2008; Bertola and Lo Prete, 2008), with Garrett (2001), and Bertola and Lo Prete (2008) providing exceptions. Second, when the sign of the coefficient of capital openness is negative, the coefficient of trade openness is either negative or not significant (Garrett,

[15] The alternative explanation is that trade openness increases the volatility of tax bases and the average size of governments as a result of hysteresis in public spending (Shelton, 2007:2254). However, even the presence of hysteresis requires that additional spending must be financed by either taxes or public debt, an issue that may further exacerbate tax base volatility.

FINANCIAL THEORY AND PRACTICE
35 (3) 327-384 (2011)

1995; Burgoon, 2001; Garrett and Mitchell, 2001; Krogstrup, 2003 – in some cases – and Liberati, 2007). Third, when the coefficient of capital openness supports CH (Quinn, 1997; Iversen, 2002; Sanz and Velàzquez, 2003; Kimakova, 2009), there are only two cases (Quinn, 1997 and Kimakova, 2009) in which the compensation hypothesis is contemporaneously supported also on the trade side. These facts strengthen our impression that controlling for capital openness is fundamental when estimating the relationship between economic integration and government size, and that the validity of the compensation hypothesis on the trade side may to some extent depend on an incomplete empirical specification of economic integration variables. To some extent, the conclusion by Gemmell et al. (2008) may be generalised to studies using *aggregate* spending, that FDI are more powerful and robust than trade openness in explaining the characteristics of government size.

3.2 COUNTRY AND PERIOD COVERAGE

As Gemmell et al. (2008) explain, the sample of countries used to analyse the impact of economic integration on government spending may affect the balance of observed country-specific and global effects of capital openness. On the one hand, they show that the general trend towards globalisation works in the direction of supporting SH; while some country-specific effect in favour of CH may be found at individual country level. Since these two forces go in opposite directions, the size and the type of the sample used may strongly affect the outcome, a result, however, that plagues much of the work in applied economics.

Critics of the compensation hypothesis use the argument of *country coverage* to argue that the positive relation that emerges when including a large number of observations is affected by relatively poor countries whose economic conditions and institutional structures are deeply different from those of OECD countries. In general terms, this diversity of institutional and political organisations would make the pooling of data from developed and developing countries quite a debatable practice. On this side, there are indeed some regularities. Quinn (1997), Rodrik (1998), Garrett (2001), Garen and Trask (2005), Epifani and Garcia (2005), Bertola and Lo Prete (2008) and Ram (2009) are all cases where a strong positive relationship between government size and trade openness emerges. But they are also studies in which the number of countries is large, exceeding 50 or, in most cases, 100 countries. Curiously, this characteristic (wide country coverage) is rarely associated with the presence of capital openness among the explanatory variables. When it is (Quinn, 1997; Garrett, 2001; Bertola and Lo Prete, 2008), the outcome is consistent with CH only in one case (Quinn, 1997), but in this case data do not extend beyond 1989. More uncertain, as can be appreciated in table 2, is the outcome of studies limiting the analysis to a defined subset of OECD, advanced, affluent or developing countries.

FINANCIAL THEORY AND PRACTICE
35 (3) 327-384 (2011)

Period coverage might also be relevant. In an influential work, Alesina and Wacziarg (1998) argued that country size might have a negative co-variation with trade openness and government consumption and that this negative co-variation may account for the positive relationship between trade openness and government size documented by Rodrik (1998). The two studies, however, refer to different periods: Rodrik used cross-section data for the late 1980s and early 1990s; while Alesina and Wacziarg (1998) used cross-sectional data for the 1980s. Furthermore, the conclusions by Alesina and Wacziarg (1998) have recently been challenged by Ram (2009), who shows the possibility of a direct link between openness and government consumption for 154 countries in the period 1960-2000, implicitly suggesting that a longer period of time may support Rodrik's hypothesis. As in the case of taxation, this suggests that the most promising studies would be those that more satisfactorily cover the greatest part of the new century. Yet, with the exception of Liberati (2007), and Bertola and Lo Prete (2008) – incidentally giving different results on the impact of both trade and capital openness – there are no studies extending the analysis beyond 2000.[16] By disregarding the most buoyant period of economic integration, results might actually underestimate the impact of openness on public spending. But it is interesting to note that also in less recent periods (therefore potentially more favourable to CH), some authors have shown that the positive association has more the nature of a country-specific issue rather than of a general rule and that in most cases, government size has not changed to mitigate the increased risk of greater openness (Islam, 2004).

3.3 ECONOMETRIC ISSUES

Econometric issues also deserve a brief discussion in the case of pubic spending. The main issue is that the core of Rodrik's paper is denied general validity when addressed from a *causality* perspective. Molana et al. (2004), for most of the 23 countries used in the Rodrik paper for the period 1948-1998, show that the hypothesised causation process (from economic integration to government size) might also follow a reverse path. This outcome is particularly important, as the authors derive their conclusions after highlighting the need to explore the stationary (or non-stationary) nature of the variables. When stationarity is obtained in first differences, results may thus diverge when using levels or changes. Garrett (2001), for example, has shown that regressions based on levels may support CH; but regressions based on changes may not. Changes in government consumption are also negatively related to trade integration in Skidmore et al. (2004), and in Hansson and Olofsdotter (2008), while in Rickard (2007) changes of central government spending bear no relation with trade openness for developed countries. More recently, Benarroch and Pandey (2009) test for whether trade openness may cause higher government expenditures. While finding some evidence in panel regressions, they find no support for a causal relationship between openness and

[16] Kimakova (2009), using lagged four-year averages of available data, has six data points for the dependent variable over the period 1980-2003, but six data points over 1976-1999 for the explanatory variables.

aggregate government expenditures after using a causality test for panel data. Rather, government size would cause greater openness in low income countries.

All these results point in the same direction, i.e. the potential relevance of estimating *changes* rather than *levels* and the need to control for causality and stationarity. Despite its potential relevance, however, the issue of stationarity (and cointegration) of variables in panel data is hardly addressed in the available empirical studies. Rodrik (1998) is the most notable exception; the issue of endogeneity is there addressed by experimenting with various measures aimed at extracting the exogenous component of trade shares, showing that the results are not much affected. Liberati (2007) is another exception, at least including a test of causality. In other cases, and less satisfactorily, endogeneity is implicitly addressed by using lagged values of the openness measure (for example in Krogstrup, 2003; Rickard, 2007; Gemmell et al., 2008; Kimakova, 2009), but no unique support to CH emerges.[17]

3.4 WHAT DO WE GAIN BY DISAGGREGATING PUBLIC SPENDING?

Economic integration may not only affect *levels* but also the *composition* of public spending. In the attempt to make locations more attractive, governments may engage in *spending competition*. In particular, public spending in privately *productive* public goods like infrastructures, training programmes, human capital is more likely to satisfy mobile production factors (Keen and Marchand, 1997; Taylor-Gooby, 1997). This possibility gives rise to a case in which public spending may increase but not necessarily in line with the basic tenet of the compensation hypothesis.

The standard hypothesis is that potential *losers* will ask for additional *social* spending in the form of health care, education or social security (e.g. Rodrik, 1998); while the potential *winners* will ask for additional public *productive* spending in the attempt to reduce incentives to exit the country. Thus, a higher level of public spending may not necessarily signal that a *classical* compensation hypothesis is in place. An increase of *productive* public spending may in fact be more consistent with SH than with CH. As Shelton (2007:2254) pointed out, large and robust increases in total expenditures associated with greater trade openness are seen in very different categories in industrialized and less-developed countries, with the former mainly expanding social security, transportation expenditures and wages at sub-national levels; and the latter expanding transportation expenditures and education, and centralizing expenditures across the board.

Table 3 gives details of the empirical studies dealing with categories of public spending. Since all problems so far addressed (definition of trade and capital openness, period and country coverage, econometric issues, etc.) still hold, we do not describe them further; rather, we will concentrate on the additional insights

[17] Regularities among studies using fixed effects, random effects or simply pooling data is harder, as not all studies provide full information about the methodology used.

FINANCIAL THEORY AND PRACTICE
35 (3) 327-384 (2011)

they can offer. It is worth starting from those studies showing empirical evidence on both a measure of *total* government size and the size of specific items of public spending. This helps us to understand whether support to CH is robust to the decomposition of public spending.

The set of studies that can be classified in favour of CH in both the aggregate dimension and for specific categories of public spending is however narrow (Quinn, 1997; Rodrik, 1998; Alesina and Wacziarg, 1998; Bertola and Lo Prete, 1998; Benarroch and Pandey, 2009 in some cases). More frequently, the empirical evidence shows support to CH on an *aggregate* level and not with reference to specific public spending (Iversen, 2002; Sanz and Velazquez, 2003; Epifani and Garcia, 2005; Benarroch and Pandey, 2009).[18]

To shed further light on this complex structure, it is worth considering one of the most comprehensive items of empirical evidence on this topic, i.e. Swank (2002). This study takes into account four groups of public spending (social welfare programs, cash payments for social assistance, unemployment compensations and government spending on health programs) and three types of countries (with *universal*, *conservative* and *liberal* welfare states), showing a strong and generalised evidence for CH only for the relationship between trade openness and social welfare programs. Capital openness (variously measured), instead, would bear more uncertain outcomes. The main lesson from Swank (2002) is that globalisation may well have differential effects depending on the institutional structure of any given country and on the *initial level* of welfare states.[19] But the uncertainty of the results prevents the design of an uncontroversial answer to whether social welfare is most at risk with economic integration.

The other studies described in table 3 only partially help disentangle the issue. The empirical evidence using the category of *social welfare* spending shows a positive relationship with trade openness only in a certain number of cases (Hicks and Swank, 1992; Quinn, 1997; Bretschger and Hettich, 2002; Gizelis, 2005; Hays et al., 2006; Adam and Kammas, 2007; Bertola and Lo Prete, 2008); the same occurs with such other categories as *social security*, *education* and *health* (Huber et al., 1993; Achini and Brem, 1998; Avelino et al., 2005; Rodrik, 1998; Dion, 2004; Shelton, 2007; Gemmell *et al*., 2008; Benarroch and Pandey, 2009).[20] Furthermo-

[18] It is worth noting that Sanz and Velazquez (2004) use σ-convergence rather than an econometric evidence. They are able to show that there has been an alignment of the structure of government spending among OECD countries, though this process has slowed down since 1980. It would mean that economic integration would make it harder to differentiate public policies, which is a result consistent with the logic of SH and already observed in the case of taxation. Since convergence is found towards the top level of social welfare spending, however, the results may to some extent be consistent also with the compensation hypothesis.

[19] This view, according to some authors, would disregard the possibility that political institutions may be *endogenous* to the economic integration process, with this latter pushing towards fragmenting veto points (like trade unions, as in Dreher and Gaston, 2008), encouraging the creation of "disciplining" supranational entities and supporting the devolution of more power to sub-national entities (fiscal federalism).

[20] Note that among the previous list, seven studies do not include a measure of capital openness, and this still leaves open the question of whether the evidence in favour of the compensation hypothesis depends on an incomplete specification of economic integration.

FINANCIAL THEORY AND PRACTICE
35 (3) 327-384 (2011)

re, when supporting CH on the trade side, capital openness (when included) does not usually support it (examples are Quinn, 1997; and Achini and Brem, 1998). But the coefficient of capital openness also does not usually support CH when support to CH on the trade side fails (with some exceptions as in Burgoon, 2001; Kaufman and Segura-Ubiergo, 2001; Swank, 2002; Sanz and Velazquez, 2003; and Burgoon, 2006).

With regard to *productive spending*, a large part of the empirical literature does not find any relation with either trade or capital openness. This is particularly true for those contributions using a measure of net or gross *public investments* (Heinemann, 1999; Skidmore et al., 2004; Hanson and Olofsdotter, 2005; Dreher et al., 2005), *public services* (Sanz and Velazquez, 2003; Dreher et al. 2005), *transport and communications* (Sanz and Velazquez, 2003; Gemmell et al., 2008). Overall, within this restricted subset of public spending (including public services, defence, culture, economic affairs, net investments, transport/communications and non-welfare spending and involving 22 empirical investigations) only eight cases can safely support higher productive spending for higher levels of economic integration (Rodrik, 1998; Sanz and Velazquez, 2003; Shelton, 2007; Gemmell et al., 2008).

It therefore seems that the validity of the compensation hypothesis is rather weak and far from general when specific spending items are observed too. Within all studies surveyed in table 3, only 12 out of 59 cases can support CH on the side of capital openness and only 25 out of 87 cases can do it on the side of trade openness. This confirms that also in this case CH seems to be more a country-specific expenditure-specific issue than a general trend of globalisation. On the other hand, a generalised convergence towards the retrenchment of the public sector and of the welfare state in particular, is also not strongly supported, even though there is a non-negligible number of cases favouring this hypothesis.

4 CONCLUSIONS

Has economic integration deeply affected the ability of governments to tax and spend? According to the available empirical literature the most likely answer is: *we do not know*. Actually, there is a non-negligible number of cases reporting results consistent with some version of CH (either on the tax or on the spending side of the public budget); at the same time, there is an even greater number of studies supporting SH. Not to speak of studies that do not achieve a definite conclusion. On the basis of the empirical evidence surveyed in this paper, it is therefore difficult to take a clear-cut position on whether and how both trade openness and capital openness have affected national public policies. It has been seen that the driving factors of this uncertainty are many (the definition of the dependent variable, the period and country coverage, the measures of capital openness). The most general impression, however, is that CH is less common than is usually thought. On the tax side, CH is all but a general result even when measured only by trade

openness, as originally suggested by Cameron (1978) and Rodrik (1998). Especially low is the support to CH given by those studies using the most mobile tax bases, *corporate* and *capital* taxation. Limited support to CH also emerges when studies dealing with total spending or specific spending items are considered. Furthermore, these results hold also in some contexts where the period coverage is potentially more favourable to ascribing a prominent role to CH. It is indeed expected that, in the near future after the present period of deep economic crisis, the size and the composition of the public budgets will more likely react according to SH. Even though this crisis does not originate in the public sector, public sectors will almost certainly pay a price in terms of austerity and budget cuts, possibly working against the compensation hypothesis. In our view, this might imply hard times for taxation of mobile tax bases and for social spending, unless a well coordinated supranational action is taken. In the absence of any such action, it will be easier for national public policies to conform to the outcome predicted by the efficiency hypothesis. But it will become crucial, for the future of this kind of empirical analysis, to consider a period of time expanding well beyond 2000, an issue that the available literature has until now hardly addressed.

TABLE 1

Economic integration and the size and composition of tax revenues

	Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with …	Capital integration mainly consistent with …
1	Cameron (1978)	18 countries	1960-1975	Increase of govt revenues as a % of GDP	Exports plus Imports divided by GDP		Positive			OLS (?)	CH	
2	Huber, Ragin and Stephens (1993)	17 advanced democracies	1956-1988	Current government receipts as a % of GDP	Exports plus imports over GDP		Positive		Significant in two out of four regressions (significant using OLS and GLS adjusting for time-specific errors)	OLS/GLS	CH	
3	Garrett (1995)	15 OECD countries	1967-1990	Capital taxes over GDP	Exports plus imports over GDP	Measure of govt restrictions on cross-border financial flows (AREAER by IMF - multiplied by minus one - higher number higher mobility)	Positive	No relation	Negative relation with trade interacted with left-labour power	Cross-sectional heteroskedastic and time-wise autoregressive panel regression	CH	No relation
4	Quinn (1997)	58-64 countries	1960-1989; 1974-1989	CG Corporate tax revenue over GDP	Trade balance over GDP	0-14 index of financial openness: (a) inward and outward capital account transactions on a 0-4 scale; (b) inward and outward current account transactions on a 0-8 scale; (c) international legal agreements on a 0-2 scale	No relation	Positive		OLS with heteroskedastic-consistent covariance matrix (White, 1984)	No relation	CH
				CG Corporate tax revenue over total taxes			No relation	No relation (neither in levels nor in changes)			No relation	No relation
				CG Corporate/ CG individual tax ratio			Positive	Positive			CH	CH

	Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with ...	Capital integration mainly consistent with ...
5	Rodrik (1997)	18 OECD countries	1965-1992	Effective tax rates on capital	Exports plus Imports divided by GDP(-1)	Dummy for restrictions on capital mobility (AREAER by IMF)	Negative. Relation disappears when dummy for restrictions on capital mobility and its interaction with trade is included.	Positive (a negative sign in the regression but a high AREAER means higher restrictions)		FE	SH	CH
				Effective tax rates on labour			Positive	Positive			SH	SH
6	Hallerberg and Basinger (1998)	OECD countries	1986-1990	Changes in top marginal tax rates for corporate and personal income taxes	Imports plus exports over GDP	Number of capital controls (AREAER)	No relation (neither for corporate nor for income tax rates)	No relation (neither for corporate nor for income tax rates)		Cross-sectional methods	No relation	No relation
7	Swank (1998)	17 advanced countries	1966-1993	Corporate profit taxation as a % of operating income	Real imports plus real exports over real GDP	(1) Total capital inflow and outflow as a % of GDP; (2) National restrictions on the cross-border movement of capital (0-4 scale); (3) National and international agreement restrictions on payments and receipts of capital (0-14 scale)	Negative	Positive relation with capital measures (1) and (3)		OLS with panel-corrected standard errors	SH	CH
				Employer social security and payroll taxation as a % of operating income			Negative	Positive relation with capital measure (3)			SH	CH

8	Heinemann (1999)	21 OECD countries	1970-1997	Taxes on corporate income over total taxation	Exports plus imports over GDP	Legal restrictions on international capital transactions	Some support to the hypothesis that taxes shift away from mobile to immobile tax bases.			Cluster analysis	SH	
				Taxes on goods and services over total taxation							SH	
				Total tax revenues over GDP			Support to the hypothesis that globalization restricts the size of public sector				SH	
9	Garrett and Mitchell (2001) - (1999)	16 OECD countries	1961-1992 with gaps	Effective tax rate on capital	(1) Exports + Imports over GDP; (2) Share of imports from low-wage countries over total imports	(3) FDI inflows and outflows over GDP; (4) International financial openness index	No relation	Positive relation with (3)		GLS with panel corrected standard errors	No relation	CH
				Effective tax rate on labour			No relation	Negative relation with (3) and (4)			No relation	CH
				Effective tax rate on consumption			Negative relation with (1) and (2) (10%)				CH	
10	Bretschger and Hettich (2002)	14 OECD countries	1967-1996	Effective average corporate tax rates	Exports plus Imports divided by GDP	(1) Restrictions on payments and receipts of capital (index ranging 0-14); (2) Investment abroad as a share of GDP	Negative	Negative	The negative relation with capital disappears when using FE instead of PCSE or when using a partial adjustment model (10%)	PCSE, FE	SH	SH
				Ratio between labour effective tax rate and corporate effective tax rate			Positive	Positive	The positive relation with capital disappears when using FE instead of PCSE		SH	SH

	Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with ...	Capital integration mainly consistent with ...
11	Swank (2002)	15 developed democracies	1965-1993 (1979-1993 in some cases)	Effective tax rates on labour	Real imports plus real exports as a % of real GDP	(1) Average (lagged 1 to 3 years) of total capital inflows and outflows as a % of GDP; (2) Average (lagged 1 to 3 years) of FDI inflows and outflows as a % of GDP; (3) Average (lagged 1 to 3 years) of borrowing on international capital markets as a % of GDP; (4) Index (scale 0-4) of the absence of national restrictions on the cross-border payments and receipts of capital; (5) Absolute value of covered interest rate parities	No relation	No relation		OLS with panel-corrected standard errors	No relation	No relation
				Effective tax rates on consumption			Positive	No relation			SH	No relation
				Effective tax rates on capital			No relation	Positive with measure (4)			No relation	CH
				Total taxes (as a % of GDP)			Positive	Negative with measure (2)			CH	SH
12	Swank and Steinmo (2002)	14 developed democracies	1981-1995	Statutory corporate tax rate	Exports plus imports over GDP	0-14 index of financial openness: (a) inward and outward capital account transactions on a 0-4 scale; (b) inward and outward current account transactions on a 0-8 scale; (c) international legal agreements on a 0-2 scale	Negative (disappears with FE)	Negative		OLS panel-corrected for heteroskedasticity and correlation; FE	SH	SH
				Effective tax rate on capital			No relation	No relation			No relation	No relation
				Effective tax rate on labour			No relation	Negative			No relation	CH
				Effective tax rate on consumption			Positive (disappears with FE)	No relation			SH	No relation

13	Krogstrup (2003)	14 European countries	1970-2001	Implicit capital tax rate	Change of exports+ imports over GDP (lagged one period)	(1) Index of capital restrictions (Quinn, 1997); (2) FDI sotcks over GDP; (3) covered interest parity differentials	Positive (10%) when using (1) and (2). Negative when using (3).	Negative with (3)	Using an interaction with country size: negative relation with (1) and (3) (10%). The interaction term is positively related to (1) and negatively related to (2). Using an interaction term with agglomeration: negative relation with (1) only. Positive relation with the interaction term with (1).	FGLS with FE	Uncertain	SH
				Corporate tax revenues over GDP			Negative using any capital indexes.	Positive relation with (1). Negative relation with (3).	Using an interaction with country size: negative relation with (2) and (3).		SH	Uncertain
				Implicit capital tax rate over implicit labour tax rate			Negative when using (3) (10%). No relation when using (1) and (2).	Negative relation with (3)			Uncertain	SH
				Corporate tax revenues over total tax revenue			Negative when using (3). No relation when using (1) and (2).	Positive with (1). Negative with both (2) (10%) and (3).			Uncertain	Uncertain
14	Stewart and Webb (2003)	19 OECD countries	1950-1999; 1965-1999 (with some exceptions)	(A) Corporate taxation over GDP (CIT/GDP); (B) Corporate taxation over total taxes (CIT/GTR); (C) Corporate+social security+payroll over GDP (ALL/GDP); (D) Corporate+social security+payroll over total taxes (ALL/GTR)	Convergence of CIT/GDP; CIT/GTR; ALL/GDP; ALL/GTR		Only modest evidence that corporate tax burdens move together in the long run across countries			Bivariate and multivariate cointegration analysis	No relation	

	Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with …	Capital integration mainly consistent with …
15	Devereux, Lockwood and Redoano (2004)	21 OECD countries	1982-1999	Statutory corporate tax rate Effective tax wedge (cost of capital minus the real interest rate)		(a) Sum of inward and outward FDI over GDP, lagged one year; (b) average global tax rate (statutory or effective)		No relation with (a). Positive relation with (b)	Tax rates tend to move together where the home country and the other countries have no capital controls. This relation disappears in countries with capital controls.	Weighted OLS corrected by heteroskedasticity and correlation	Uncertain Uncertain	
16	Slemrod (2004)		1980-1995	Statutory corporate tax rate Average corporate tax rate	(1) Exports plus imports over GDP; (2) Sachs-Werner measure of openness		Negative with (2) in one out of two regressions Positive with (1) in one out of two regressions			Pooled cross-sectional, FE	SH CH	
17	Beauchamp and Montero (2005)	13 advanced industrial economies	1981-2004 (?)	Corporate tax rate		Average global tax rate lagged 5 years (proxy of tax competition)		Negative (more tax competition lower corporate tax rates)		OLS (?)		SH
18	Dreher (2005)	30 OECD countries (unbalanced panel)	1970-2000 (variable)	Average effective tax rate on labour Average effective tax rate on consumption Average effective tax rate on capital	Index of globalization using 23 variables or sub-index of economic integration. On the trade side (a) trade in % of GDP; (b) hidden import barriers; (c) mean tariff rate; (d) taxes on international trade	Index of globalization using 23 variables or sub-index of economic integration. On the capital side (a) FDI in % of GDP; (b) FPI in % of GDP; (c) income payments to foreign nationals in % of GDP; (d) capital account restrictions.	No relation No relation Positive	No relation No relation Positive	It holds with both OLS and GMM It holds with both OLS and GMM Positive relation with economic integration with both OLS (10%) and GMM. Positive relation with the measure of ETR developed by Volkerink and de Haan (2001).	OLS and GMM	No relation No relation CH	No relation No relation CH

				Adjusted statutory tax rates on capital (Devereux and Griffith, 2003)			Negative	Negative	The relation disappears when introducing a lagged dependent variable		SH	SH
19	Winner (2005)	23 OECD countries	1965-2000	Average effective tax rate on capital		Absolute difference between saving and investment over GDP		Negative and robust to GMM	Sensitivity analysis: (a) using trade openness gives negative relation at 10%; (b) using the Quinn-index of capital mobility gives no relation	FGLS, GMM		SH
				Average effective tax rate on labour				Positive. Disappears using GMM	Sensitivity analysis: (a) using trade openness gives positive relation; (b) using the Quinn-index of capital mobility gives no relation			SH
				Average effective tax rate on extended labour (labour + consumption)				Positive. Disappears using GMM	Sensitivity analysis: (a) using trade openness gives positive relation; (b) using the Quinn-index of capital mobility gives positive relation			SH
				Capital to labour tax ratio				Negative Disappears using GMM	Sensitivity analysis: (a) using trade openness gives negative relation; (b) using the Quinn-index of capital mobility gives negative relation at 10%			SH
				Capital to extended labour tax ratio				Negative. At 10% using GMM	Sensitivity analysis: (a) using trade openness gives negative relation at 10%; (b) using the Quinn-index of capital mobility gives negative relation at 10%			SH

	Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with …	Capital integration mainly consistent with …
20	Haufler, Klemm, Schjelderup (2006)	23 OECD countries	1980-2001	Ratio of statutory corporate tax rate and effective wage tax rate (average OECD worker) – Tax Mix	(1) Exports plus imports over GDP; (2) Share of value added in the service sector to value added in manufacturing	(3) Index of capital market restrictions (Quinn, 1997); (4) Outward FDI stock over GDP	No relation with (1). Positive with (2)	Positive with (3) when using FE. Negative when removing FE. No relation with (4)		FE	Uncertain	Uncertain
21	Adam and Kammas (2007)	17 OECD countries	1970-1997	Effective corporate (C) income tax ratio	Exports plus imports over GDP, corrected by country size		Negative		No relation in corporatist countries. Negative relation (10%) in non-corporatist countries.	OLS with panel-corrected standard errors	SH	
				Effective labour (L1) income tax ratio			Positive		Positive relation in both corporatist and non-corporatist countries		SH	
				Effective social security contributions (SSC) ratio			Positive		Positive relation in corporatist countries. No relation in non-corporatist countries		SH	
				Effetive labour income tax ratio excluding SSC (L2)			No relation		No relation in both corporatist and non-corporatist countries		No relation	
				Ratio C/L1			Negative (10%)				SH	
				Ratio C/L2			No relation				No relation	
				Ratio C/SSC			Negative				SH	
				Ratio SSC/L2			Positive				No relation	

22	Schwarz (2007)	20 OECD countries	1979-2000	Corporate to labour tax ratio (EATR) (King-Fullerton, 1984 and Devereux and Griffith, 2003)		Index of capital account restrictions (Quinn, 1997)		Negative in 3 of 4 regressions		OLS (?)		SH
				Macro-corporate tax ratio (Mendoza et al., 1994; Volkerink and de Haan, 2001)				Negative in 1 of 5 regressions				Uncertain
				Microeconomic tax ratio (uses data on company accounts)				No relation				No relation
23	Bullmann (2008)	18 OECD countries (as in Cameron)	1960-1975 (replicate Cameron); 1960-2006	General govt receipts as a share of GDP (in differences)	Exports plus Imports divided by GDP	FDI net outflows as a share of GDP	Positive with levels. Negative with changes.	Negative (10%)	Levels of govt receipts are negatively related to trade when controlling for time and entity effects	Pooled OLS, FE	Uncertain	SH
24	Gastaldi (2008)	18 OECD countries	1970-2005 (with gaps)	Effective tax rates on mobile capital (convergence)	Real exports plus imports divided by real GDP	(a) Outward FDI flows over GDP; (b) outward FPI flows over GDP (assets)	No relation	Negative with (a) in all specifications but one limiting the time period to before 1990. No relation with (b)		FGLS and PCSE	No relation	SH
				Effective tax rates on immobile capital (convergence)			No relation	No relation with either (a) or (b)		FGLS	No relation	No relation
				Effective tax rates on labour (convergence)			Negative at 10%	Positive with (a). No relation with (b)		FGLS	No relation	SH
				Effective tax rates on consumption (convergence)			No relation	No relation with either (a) or (b)		FGLS	No relation	No relation

TABLE 2

Economic integration and the size of public spending

	Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with …	Capital integration mainly consistent with …
1	Swank (1988)	18 affluent democracies	1960-1980	Changes in non-military domestic spending over GDP (in logs)	Exports plus imports over GDP		Negative in 1960-1973; Positive in 1973-1980			OLS	SH in 1960-1973; CH in 1973-1980	
2	Garrett (1995)	15 OECD countries	1967-1990	Govt spending in % of GDP	Exports plus imports over GDP	Measure of govt restrictions on cross-border financial flows (higher score, more capital mobility)	No relation	Negative (10%)	Positive relation of both trade and capital mobility interacted with left-labour power		No relation	SH
3	Quinn (1997)	58-64 countries	1960-1989; 1974-1989	Govt consumption (excluding defence and education) over GDP	Trade balance over GDP	0-4 measure of capital account regulation	Positive	Positive			CH	CH
4	Rodrik (1997)	22 countries	Cross section/ 1966-1991	Govt consumption over GDP in OECD countries	(1) Export plus imports over GDP; (2) Terms of trade (volatility)	Capital account restrictions (AREAER)	No relation with (1) and (2)	No relation	Using *panel data:* Negative relation with (1) (10%). Robust to the introduction of interaction (1) with AREAER. Positive sign on the interaction term.	Cross-section analysis and FE	No relation	No relation
		32 countries	Cross-section	Govt consumption over GDP in countries with 1985 per capita GDP > $4,500			Negative (10%)	No relation	Positive relation with (1) and (2) interacted		SH	No relation
		109 countries		Govt consumption over GDP			Negative (10%)	No relation	Positive relation with (1) and (2) interacted		SH	No relation

5	Cusack (1997)	15/16 countries	1955-1989	Change of non-military government spending in % of GDP		Annual average of the absolute value of 1 minus the ratio of private investments to private savings		Negative		Pooled cross-sectional time-series		SH
6	Rodrik (1998)	103 or 125 countries	1985-1989; 1990-1992	Three- or five-year average of real govt consumption as a % of GDP	Exports plus Imports divided by GDP (average over the previous decade)		Positive		Results are robust to the inclusion of terms of trade. A measure of *external risk* (the product between openness and terms of trade) is positively related to govt consumption. Social security and welfare are positively associated to external risk		CH	
7	Alesina and Wacziarg (1998)	?	1985-1989	Govt consumption in % of GDP	Exports plus imports divided by GDP (1975-1984)		*Variables in logs*: Positive (with and without controlling for country size)		*Variables not in logs*: Positive relation without controlling for country size. No relation controlling for country size		CH	
8	Iversen and Cusack (2000)	15 countries	1961-1993	Level of and change of government consumption (total govt consumption of goods and services net of military spending) as a % of GDP	Exports plus Imports divided by GDP	An index measuring the extent to which capital markets are liberalised (Quinn and Inclan, 1997)	No relation with levels (10%). No relation with changes	No relation with levels. Negative relation with changes			No relation	No relation

	Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with …	Capital integration mainly consistent with …
9	Garrett (2001)	87-116 countries	1985-1995	Central govt spending as a % of GDP			Positive (in levels)	No relation (in levels)	Estimation in changes gives no relation with trade and capital. Interaction between trade and capital not significant		CH	No relation
				General govt consumption in % of GDP	Exports plus Imports divided by GDP	Index of government restrictions on capital account transactions (IMF)	Positive (in levels)	No relation (in levels)	Estimation in changes gives a negative association of trade with govt consumption. No effects of capital restrictions. Interaction between trade and capital not significant		CH	No relation
10	Burgoon (2001)	18 OECD countries	1961-1994; 1980-1994	Total govt spending over GDP	(1) Exports plus imports over GDP; (2) Low-wage imports (from non-OECD countries) over total imports	(3) Inward and outward FDI over GDP; (4) Portfolio flows over GDP	Negative with (1). Positive with (2)	No relation			Uncertain	No relation
				Govt consumption (including health and education) over GDP			Negative with (1)	Negative with (3) at 10%			SH	SH
11	Garrett and Mitchell (2001)	16 OECD countries	1961-1993 with gaps	Total govt spending over GDP	(1) Exports + Imports over GDP; (2) Share of imports from low-wage countries over total imports	(3) FDI inflows and outflows over GDP; (4) International financial openness index	Negative with (1)	Negative with (4) (10%)		XTGLS with panel corrected standard errors	SH	SH
				Govt consumption over GDP			Negative with (1)	No relation			SH	No relation
12	Iversen (2002)	15 OECD countries	1961-1993	Total government spending	Exports plus imports over GDP	Capital market liberalization as in Quinn and Inclan (1997)	No relation	Positive relation (10%)		OLS	No relation	CH

13	Sanz and Velàzquez (2003)	26 OECD countries	1970-1997	Govt expenditures in % of GDP	Exports plus Imports divided by GDP	Sum of inward and outward stock of FDI as a % of GDP	No relation	Positive		OLS	No relation	CH
14	Krogstrup (2003)	14 European countries	1970-2001	Primary expenditures over GDP	Change of exports+ imports over GDP (lagged one period)	(1) Index of capital restrictions (Quinn, 1997); (2) FDI stocks over GDP; (3) covered interest parity differentials	Positive when using (1) and (2). Negative when using (3).	Negative with (3) only		FGLS with FE	CH	Uncertain
15	Islam (2004)	6 OECD countries (separate time series analysis)	Various time spans for individual countries	Govt expenditures in % of GDP	Exports plus Imports divided by GDP		(1) In USA: negative relation with trade; (2) in Australia: positive relation with ToT; (3) Canada: positive relation with trade; negative relation with ToT; (4) England: positive relation with trade; (weak) negative relation with ToT; (5) Norway: positive relation with trade; negative relation with ToT; (6) Sweden: (weak) positive relation with trade				Uncertain	
16	Molana, Montagna, Violato (2004)	23 OECD countries	1948-1998	Govt consumption in % of GDP	Exports plus Imports divided by GDP		Refusal of the universal validity of the compensation hypothesis. Only Japan, Norway and UK satisfy the causality test (from trade openness to govt size)				No relation	

	Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with ...	Capital integration mainly consistent with ...
17	Brady, Beckfield and Seeleib-Kaiser (2004)	17 affluent democracies	1975-1998 (with some missing years for some countries)	Govt expenditures as a % of GDP	16 measures of globalization: (1) inward FDI; (2) inward PI; (3) net investment; (4) exports; (5) net trade; (6) net globalization; (7) FDI openness; (8) investment openness; (9) trade openness; (10) total globalization; (11) capital account liberalization index; (12) current accounts liberalization index; (13) outward FDI; (14) outward PI; (15) imports; (16) net migration		Negative relation with the measures (1), (7) and (13)	Failure to verify the curvilinear hypothesis (squared terms)			Uncertain
18	Skidmore, Toya and Merriman (2004)	Max 208 countries	1960-2000	Changes in govt consumption (per capita and over GDP)	Average ratio of real imports+exports to real GDP (in 5-year intervals)		Negative (both per capita and over GDP)			FE	SH	
19	Garen and Trask (2005)	116 countries	1990	Government expenditures as a % of GDP	Exports plus Imports divided by GDP		Positive				CH	
				Government consumption as a % of GDP			Positive				CH	
20	Hanson and Olofsdotter (2005)	20 OECD countries (unbalanced panel)	1970-2002	Annual change in govt consumption as a % of GDP	Annual change in the sum of exports and imports as a % of GDP	Annual change in the sum of FDI inflows and outflows as % of GDP	Negative (only with FGLS and 2SLS)	No relation			SH	No relation

21	Dreher (2005)	30 OECD countries (unbalanced panel)	1970-2000 (variable)	Total spending over GDP	Index of globalization using 23 variables or sub-index of economic integration. On the trade side (a) trade in % of GDP; (b) hidden import barriers; (c) mean tariff rate; (d) taxes on international trade	Index of globalization using 23 variables or sub-index of economic integration. On the capital side (a) FDI in % of GDP; (b) FPI in % of GDP; (c) income payments to foreign nationals in % of GDP; (d) capital account restrictions	No relation	No relation			No relation	No relation
22	Kittel and Winer (2005)	17 OECD countries (use Garrett and Mitchell, 2001 dataset)	1961-1993	Total govt spending over GDP	(a) Exports plus imports over GDP; (b) Share of imports from low-wage countries over total imports	(c) FDI flows over GDP	*Pooled OLS:* Positive with (a). Negative with (b). *FE:* No relation with (a). Positive with (b). *BE:* No relation.	*Pooled OLS:* No relation. *FE:* No relation. *BE:* No relation.	In *LEVELS:* FE_PW, WLS: Positive relation with (b). FE, GM, WLS, PCSE: Negative relation with (a). No relation with (c). In *FIRST DIFFERENCES:* Negative relation with (c) when using WLS	Pooled OLS, FE, BE, PW, WLS, GM, PCSE (static and dynamic specifications)	Uncertain	Uncertain
23	Epifani and Gancia (2005)	150 countries	1950-2000; 1975-2000	General govt consumption in % of GDP	Exports plus Imports divided by GDP		Positive			FE, RE	CH	
		subset of countries	1972-1999	Central govt expenditures in % of GDP			Positive				CH	
24	Hays, Ehrlich and Peinhardt (2006?)	17 OECD countries	1960-2000	Govt consumption over GDP	(1) Imports; (2) Imports x Deindustrialization (as in Iversen and Cusack); (3) Exports		Positive with (1). Negative with (2). Negative with (3).			LSDV	Uncertain	

	Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with ...	Capital integration mainly consistent with ...
25	Liberati (2007)	15-20 countries depending on the specifications	Max range 1967-2003 (unbalanced panel, with missing years)	Central govt expenditures in % of GDP	Exports plus Imports divided by GDP	(1) Sum of outward and inward FDI; (2) Sum of outward and inward FPI	No relation	Negative	The same holds for estimations in changes rather than in levels		No relation	SH
				General govt expenditures in % of GDP			No relation	Negative			SH	SH
26	Rickard (2007)	19 developing countries	1976-1996	Changes in total central govt spending	Change of imports x Lagged skill ratio (skilled to unskilled workers). Use both variables also in isolation.		Positive with the interaction term		Negative relation with change in imports. Negative relation with lagged skill ratio (10%).	ECM	Uncertain	
		24 developed countries	1976-1997				No relation				No relation	
27	Gemmell, Kneller and Sanz (2008)	25 OECD countries	1980-1997	General govt expenditures in % of GDP	Exports plus Imports divided by GDP	Inward stock of FDI as a share of GDP	Positive or no relation (depending on specifications)	Positive or no relation (depending on specifications)			Uncertain	Uncertain

28	Bertola, Lo Prete (2008)	Max 137 countries	1980-2003	Government share of GDP (PWT)	Exports plus Imports divided by GDP (in logs). 5-year averages	Credit information index	Positive relation	No relation (one in five regressions)	The positive relation with trade is weaker when considering only OECD countries.	Cross-sectional analysis	CH	No relation
29	Benarroch, Pandey (2008)	96 countries	1970-2000	Government consumption as a % of GDP (in logs)	Export plus imports divided by GDP (in logs and lagged)		No relation. Negative relation when an interaction term between openness and volatility is introduced			FE/AB	Reverse causality	
30	Ram (2009)	154 countries	1960-2000	Government consumption as a % of GDP (in logs)	Exports plus Imports divided by GDP (in logs)		Positive relation		Robust to OLS and fixed effects. Robust to annual data and to 5/10 year averages.	OLS/FE	CH	
31	Kimakova (2009)	87 developing and developed countries	1976-1999; 1980-2003	Government consumption as a % of GDP (in logs)	Exports plus Imports divided by GDP (in logs), lagged four-year segment	Gross private capital flows in % of GDP (in logs), lagged four-year segment	Positive relation	Positive relation	Sign of trade openness not robust without time trend and dummy variable for the 90s	FE/RE/AB	CH	CH
32	Benarroch, Pandey (2009)	120 countries	1972-2000	Government consumption as a % of GDP (in logs) Government expenditure as a % of GDP	Exports plus Imports divided by GDP (in logs and lagged)		Positive relation		Positive relation holds only for low income countries when an interaction term is introduced	FE	CH CH	

TABLE 3

Economic integration and the composition of public spending

	Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with …	Capital integration mainly consistent with …
1	Pampel and Williamson (1988)		1950-1980	Social welfare spending over GDP	Exports plus imports over GDP (with one lag)		No relation		Positive in one out of five regressions	GLS	No relation	
2	Hicks and Swank (1992)	18 advanced democracies	1960-1982	Welfare spending over GDP	Exports plus imports over GDP (with one lag)		Postive		Robust to welfare effort with and without party interactions	GLS + jackknife replication	CH	
3	Huber, Ragin and Stephens (1993)	17 advanced democracies	1956-1988	Social security transfers over GDP	Exports plus imports over GDP		Positive		Significant in two out of four regressions (significant using GLS adjusting for country-specific errors and for country-specific and time-specific errors simultaneously)	OLS/GLS	CH	
				Total social security benefits over GDP			No relation				No relation	
4	Garrett (1995)	15 OECD countries	1967-1990	Budget deficits	Exports plus imports over GDP	Measure of govt restrictions on cross-border financial flows.	Negative	Negative	Positive relation of both trade and capital mobility interacted with left-labour power		SH	SH
5	Quinn (1997)	58-64 countries	1960-1989; 1974-1989	Govt welfare and social security spending over GDP	Trade balance over GDP	0-4 measure of capital account regulation	Positive	Positive			CH	CH

		19 countries	Cross-section/ 1966-1991	Social security and welfare over GDP in OECD countries			Negative with (1) and (2). Positive with (1) and (2) interacted	No relation	Using *panel data:* Negative relation with (1) (10%). Robust to the introduction of interaction (1) with AREAER. Positive sign on the interaction term		SH	No relation
6	Rodrik (1997)	25 countries	Cross-section	Social security and welfare over GDP in countries with 1985 per capita GDP > $4,500	(1) Export plus imports over GDP; (2) Terms of trade (volatility)	Capital account restrictions (AREAER)	Negative with (1) and (2). Positive with (1) and (2) interacted	No relation		Cross-section analysis and FE	SH	No relation
		68 countries		Social security and welfare over GDP			Negative with (1) and (2). Positive with (1) and (2) interacted	No relation			SH	No relation
7	Rodrik (1998)	103 or 125 countries	1985-1989; 1990-1992	Various categories of govt spending	Exports plus Imports divided by GDP (average over the previous decade)		Positive with: (a) public services; (b) defense (10%); (c) education; (d) health; (e) housing; (f) culture; (g) economic affairs and services		Results are robust to the inclusion of terms of trade. A measure of *external risk* (the product between openness and terms of trade) is positively related to govt consumption. Social security and welfare are positively associated to external risk		CH	
8	Alesina and Wacziarg (1998)		1980-1984	Six categories of public spending over GDP	Exports plus imports divided by GDP (1980-1984)		Positive with total govt current expenditures (including transfers and interest payments). All regressions controlled for country size		Positive with public investments. All regressions controlled for country size.		CH	

	Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with …	Capital integration mainly consistent with …
9	Achini and Brem (1998)	22 OECD countries	1960-1995	Social security transfers as a % of GDP	Exports plus imports divided by GDP	Inward+Outward Capital Transaction+International Legal Agreements of Exchange Restrictions	*Levels*: Positive	*Levels*: Positive	*Annual changes*: Negative relation with trade openness. No relation with capital openness. Sensitivity analysis for individual countries (8 countries with negative relation; 8 with no relation; 6 with positive relation)		CH	CH
10	Heinemann (1999)	21 OECD countries	1970-1997	Govt spending on social security over total expenditures	Exports plus imports over GDP	Legal restrictions on international capital transactions	No support to the hypothesis that expenditures shift away from social security towards investments for more globalised countries			Cluster and discriminant analysis	No relation	
				Govt net investment over total expenditures								
				Public debt over GDP			No support to the hypothesis that more open countries may have constraints in using public debt.				No relation	No relation
				Primary surplus over GDP								
11	Iversen and Cusack (2000)	15 countries	1961-1993	Level of and change in government transfers (all government payments to the civilian household sector)	Exports plus Imports divided by GDP	An index measuring the extent to which capital markets are liberalised (Quinn and Inclan, 1997)	No relation with levels. Positive with changes	No relation with levels. No relation with changes			Uncertain	No relation

12	Garen and Trask (2001)	116 countries	1990	Government transfers and subsidies as a % of GDP	Exports plus Imports divided by GDP		?					
				Government ownership rating			Negative				SH	
13	Burgoon (2001)	18 OECD countries	1961-1994; 1980-1994	Social security transfers over GDP	(1) Exports plus imports over GDP; (2) Low-wage imports (from non-OECD countries) over total imports	(3) Inward and outward FDI over GDP; (4) Portfolio flows over GDP	Negative with (1)				SH	
				Social expenditures over GDP			Negative with (1)		*Changes:* negative relation with changes and levels of (1)		SH	
				Retirement cash and services over GDP			Negative with (1)		*Changes:* Negative relation with levels of (1)		SH	
				Health-care over GDP			No relation with (1) or (2)		*Changes:* No relation		No relation	
				Family cash and services over GDP			No relation with (1) or (2)		*Changes:* Negative relation with levels of (1) at 10%. Positive relation with (4) in levels		No relation	
				Training and relocation benefits over GDP			No relation with (1). Positive relation with (2) at 10%.	Positive relation with (3) and (4)	*Changes:* No relation with levels and changes of (1). Positive relation with changes and levels of (2). Positive relation with (3) in levels.		No relation	CH

	Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with ...	Capital integration mainly consistent with ...
14	Kaufman and Segura-Ubiergo (2001)	14 Latin American countries	1973-1997	Changes of welfare spending (social security, health care, education): (a) in per capita 1995 dollars; (b) over GDP; (c) as a share of central govt spending (net of interests)	Exports plus imports over GDP	Index of capital account liberalization (Morley, Machado and Pettinato, 1999).	Negative (both lagged levels and changes) for all definitions of welfare spending.	Positive with welfare spending definition (c)	Using an interaction term (trade x capital) with one lag, the negative relation with trade survives for definitions (a) and (b). It emerges a positive relation of welfare (definition (c) with lagged capital. The interaction term (lag and changes) is negatively related to welfare (all definitions).	PCSE ECM	SH	Uncertain
				Changes of social security spending (definitions as above)			Negative (both lagged levels and changes) for all definitions of welfare spending.	No relation			SH	No relation.
				Changes of health+education expenditures (definitions as above)			No relation	Positive			No relation	CH
15	Garrett and Mitchell (2001)	16 OECD countries	1961-1993 with gaps	Social security transfers over GDP	(1) Exports + Imports over GDP; (2) Share of imports from low-wage countries over total imports	(3) FDI inflows and outflows over GDP; (4) International financial openness index	Negative with (1)	No relation		XTGLS with panel corrected standard errors	SH	No relation

16	Swank (2002)	15 developed democracies	1965-1993 (1979-1993 in some cases)	Total govt expenditure for social welfare programs as a % of GDP	Real imports plus real exports as a % of real GDP	(1) Average (lagged 1 to 3 years) of total capital inflows and outflows as a % of GDP	Positive	Positive	Positive relation with capital mobility interacted with social corporatism. Positive relation with capital mobility interacted with universalism. Negative relation with capital mobility interacted with liberalism. No support for the curvilinear hypothesis (squared term of capital liberalization)	CH	CH
						(2) Average (lagged 1 to 3 years) of FDI inflows and outflows as a % of GDP	Positive	No relation		CH	No relation
						(3) Average (lagged 1 to 3 years) of borrowing on international capital markets as a % of GDP	Positive	No relation		CH	No relation
						(4) Index (scale 0-4) of the absence of national restrictions on the cross-border payments and receipts of capital	Positive	Positive		CH	CH
						(5) Absolute value of covered interest rate parities	Positive	No relation		CH	No relation

Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with ...	Capital integration mainly consistent with ...
					(1) Average (lagged 1 to 3 years) of total capital inflows and outflows as a % of GDP	(A) *Universal welfare states*: No relation	(A) *Universal welfare states*: positive			No relation	CH
					(2) Average (lagged 1 to 3 years) of FDI inflows and outflows as a % of GDP	(A) *Universal welfare states*: No relation; B) *Liberal welfare states*: No relation.	(A) *Universal welfare states*: positive; (B) *Liberal welfare states*: Negative				
Swank (2002)	15 developed democracies	1965-1993 (1979-1993 in some cases)	Cash payments for old age, disability, injury, sickness, unemployment and social assistance as a % of GDP	Real imports plus real exports as a % of real GDP	(3) Average (lagged 1 to 3 years) of borrowing on international capital markets as a % of GDP	(A) *All nations*: No relation; B) *Conservative welfare states*: No relation; (C) *Liberal welfare states*: No relation	(A) *All nations*: Positive; (B) *Conservative welfare states*: Positive; (C) *Liberal welfare states*: Negative.			No relation	SH
					(4) Index (scale 0-4) of the absence of national restrictions on the cross-border payments and receipts of capital	(A) *All nations*: No relation	(A) *All nations*: Positive			No relation	CH
					(5) Absolute value of covered interest rate parities	(A) *All nations*: No relation	(A) *All nations*: Negative			No relation	SH

Swank (2002)	15 developed democracies	1965-1993 (1979-1993 in some cases)	% of average production worker's gross income replaced by unemployment compensation, unemployment assistance and various entitled social welfare during first year of unemployment	Real imports plus real exports as a % of real GDP	(1) Average (lagged 1 to 3 years) of total capital inflows and outflows as a % of GDP	No relation	No relation	Positive relation with capital mobility interacted with social corporatism. Positive relation with capital mobility interacted with universalism. Negative relation with capital mobility interacted with liberalism		No relation	No relation
					(2) Average (lagged 1 to 3 years) of FDI inflows and outflows as a % of GDP	(A) *Liberal welfare states*: No relation	(A) Liberal welfare states: Negative			No relation	SH
					(3) Average (lagged 1 to 3 years) of borrowing on international capital markets as a % of GDP	(A) *Liberal welfare states*: No relation	(A) *Liberal welfare states*: Negative			No relation	SH
					(4) Index (scale 0-4) of the absence of national restrictions on the cross-border payments and receipts of capital	(A) *Liberal welfare states*: No relation	(A) *Liberal welfare states*: Negative			No relation	SH
					(5) Absolute value of covered interest rate parities	(A) *All nations*: No relation	Negative with capital mobility interacted with social corporatism. Negative with capital mobility interacted with universalism. Positive with capital mobility interacted with liberalism			No relation	SH (CH in one case)

	Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with ...	Capital integration mainly consistent with ...
	Swank (2002)	15 developed democracies	1965-1993 (1979-1993 in some cases)	Govt spending on health programs as a % of GDP	Real imports plus real exports as a % of real GDP	(1) Average (lagged 1 to 3 years) of total capital inflows and outflows as a % of GDP	(A) *Conservative welfare states*: No relation	(A) *Conservative welfare states*: Positive			No relation	CH
						(2) Average (lagged 1 to 3 years) of FDI inflows and outflows as a % of GDP	(A) *Conservative welfare states*: No relation	(A) *Conservative welfare states*: Positive			No relation	CH
						(3) Average (lagged 1 to 3 years) of borrowing on international capital markets as a % of GDP	(A) *Liberal welfare states*: No relation	(A) *Liberal welfare states*: Negative			No relation	SH
						(4) Index (scale 0-4) of the absence of national restrictions on the cross-border payments and receipts of capital	(A) *All nations*: Positive	(A) *All nations*: No relation			CH	No relation
						(5) Absolute value of covered interest rate parities	(A) *All nations*: Positive	(A) *All nations*: Positive			CH	CH
17	Bretschger and Hettich (2002)	13 OECD countries	1967-1996	Social expenditures as a % of GDP	Exports plus Imports divided by GDP		Positive			PCSE, FE	CH	

18	Iversen (2002)	15 OECD countries	1961-1993	Government transfers	Exports plus imports over GDP	Capital market liberalization as in Quinn and Inclan (1997)	No relation	No relation		OLS	No relation	No relation
				Government consumption			No relation	No relation			No relation	No relation
				Unemployment replacement rates			Negative relation	No relation	The negative relation with trade holds for both levels and changes		SH	No relation
19	Huber and Stephens (2003)	29 Latin American and Caribbean countries	1970-2000	Health+education expenditures over GDP		(1) Net inflows over GDP; (2) Index for capital account liberalization		n.a.	n.a.	n.a.	n.a.	n.a.
				Social security and welfare expenditures over GDP				n.a.	n.a.	n.a.	n.a.	n.a.
20	Sanz and Velàzquez (2003)	26 OECD countries	1970-1997	Various categories of expenditures in share of total govt expenditures	Exports plus Imports divided by GDP	Sum of inward and outward stock of FDI as a % of GDP	No relation	Positive with: (a) public services; (b) health. Negative relation with FDI of: (a) defence; (b) education; (c) housing; (d) transport & comm.			Uncertain	Uncertain

	Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with …	Capital integration mainly consistent with …
21	Korpi and Palme (2003)	18 countries	1975-1995	Cuts in at least one of three programs: sickness, work accident and unemployment insurance	Export/import share	(1) Capital account deregulation; (2) Current account deregulation	Positive. The relation disappears when considering only European countries	No relation	The result is robust to the inclusion of the left cabinet variable	Exponential model with constant hazard rate	CH	No relation
22	Dion (2004)	49 middle-income countries	1980-1999	Education spending over GDP	Exports plus imports over GDP	(1) Gross private capital flows over GDP; (2) Net FDI over GDP	Positive. It disappears when using spending changes	Weakly positive with (1). No relation with (2). The relation with (1) turns negative when using spending changes (still weak)		Prais-Winsten, FE	CH	Uncertain
				Health spending over GDP				No relation with either (1) or (2). Weakly positive when using spending changes			CH	Uncertain
				Social security and welfare spending over GDP			No relation. Weakly negative when using spending changes	Weakly positive with (1) and (2). Disappear when using spending changes			Uncertain	Uncertain

23	Brady, Beckfield and Seeleib-Kaiser (2004)	17 affluent democracies	1975-1998 (with some missing years for some countries)	Social security transfers as a % of GDP	16 measures of globalization: (1) inward FDI; (2) inward PI; (3) net investment; (4) exports; (5) net trade; (6) net globalization; (7) FDI openness; (8) investment openness; (9) trade openness; (10) total globalization; (11) capital account liberalization index; (12) current accounts liberalization index; (13) outward FDI; (14) outward PI; (15) imports; 16) net migration		No relation	Negative with measures (1), (7) and (13). Positive with measure (11)	Curvilinear hypothesis verified only with respect to measure (16)		No relation	Uncertain
24	Skidmore, Toya and Merriman (2004)	Max 208 countries	1960-2000	Changes in govt investments (per capita and over GDP)	Average ratio of real imports+exports to real GDP (in 5-year intervals)		No relation			FE	No relation	
				Changes in govt education expenditures (per capita and over GDP)			No relation				No relation	
25	Hanson and Olofsdotter (2005)	20 OECD countries (unbalanced panel)	1970-2002	Annual change in govt transfers as a % of GDP	Annual change in the sum of exports and imports as a % of GDP	Annual change in the sum of FDI inflows and outflows as % of GDP	No relation	No relation			No relation	No relation
				Annual change in govt fixed investments as a % of GDP			Negative (only with FGLS)	No relation			SH	No relation

	Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with …	Capital integration mainly consistent with …
26	Mares (2005)	More than 100 countries	?	Aggregate social policy protection index (old-age, sickness, disability, unemployment insurance) on a 0-10 scale for each item	(1) Export plus imports over GDP; (2) Variability in terms of trade (external risk)		No relation with (1). Negative with (2).		A positive relation emerges when (2) is interacted with export concentration. The result is basically robust to the introduction of political control variables	?	Uncertain	
				Unemployment insurance index (0-10 scale)			Weakly negative with (2)		Only when a term interacting external risk, export concentration and state capacity is introduced		SH	
27	Dreher (2005)	30 OECD countries (unbalanced panel)	1970-2000 (variable)	Social spending over GDP	Index of globalization using 23 variables or sub-index of economic integration. On the trade side (a) trade in % of GDP; (b) hidden import barriers; (c) mean tariff rate; d) taxes on international trade	Index of globalization using 23 variables or sub-index of economic integration. On the capital side (a) FDI in % of GDP; (b) FPI in % of GDP; (c) income paymentsto foreign nationals in % of GDP; (d) capital account restrictions.	No relation	No relation			No relation	No relation
28	Gizelis (2005)	14 European countries	1983-1988	Welfare spending over GDP	Exports+Imports over GDP	FDI (?)	Positive	No relation		3SLS	CH	No relation

29	Hicks and Zorn (2005)	18 OECD countries	1978-1994	Retrenchment in real per capita social spending	Exports+Imports over GDP	(a) Ratio of outward FDI investments over GDP; (b) Quinn-index of financial liberalization	No relation	No relation. Positive with the Quinn index (means higher liberalization lower retrenchment)	Results do not change when including control variables of fiscal nature	Cox model	No relation	No relation
				Social spending over GDP			No relation	No relation with FDI. Positive with the Quinn index	The positive relation disappears when introducing a lagged dependent variable	GLS with AR(1)	No relation	Uncertain
30	Dreher, Sturm and Ursprung (2005) - published in Public Choice (2008)	WDI dataset - 60 countries	1971-2001	Four expenditure categories in % of GDP: (1) capital (CP); (2) goods and services (GS); (3) Interest payments (IP); (4) Subsidies and current transfers (ST)	Exports plus Imports divided by GDP	Capital openness: (1) Sum of FDI inflows and outflows in % of GDP; (2) A 0-1 index of restrictions on the capital account (IMF)	No relation	No relation			No relation	No relation
		WDI dataset - 18 OECD countries	1971-2001				No relation	No relation			No relation	No relation
		OECD dataset - 10 countries	1991-2001	Ten expenditure categories: public services; defence; public order; economic affairs; environment; housing; health; recreation; education; social			No relation	No relation			No relation	No relation
31	Epifani and Gancia (2005)	subset of countries	1972-1999	Central govt transfers for social security and welfare in % of GDP	Exports plus Imports divided by GDP		Negative				SH	

	Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with …	Capital integration mainly consistent with …
32	Avelino, Brown and Hunter (2005), previous version in 2001	19 Latin American countries	1980-1999	Social spending over GDP	Exports plus imports over GDP (also PPP-based)	International financial openness (quantitative measure of the regulation of international financial transactions, both in current and capital accounts)	Negative (robust to the use of Prais-Winsten method). Positive when using a PPP-based measure (the positive relation also extends to changes of social spending)	Negative with an interaction term *financial openness and democracy*	Interaction term *trade and democracy* not significant.	PCSE	Uncertain	SH
				Education expenditures over GDP			Positive with a PPP-based measure of trade (robust to the use of Prais-Winsten method)	No relation			CH	No relation
				Health expenditures over GDP			No relation	No relation			No relation	No relation
				Social security expenditures over GDP			Positive	No relation			CH	No relation
33	Burgoon (2006)	21 industrialized countries (Comparative Manifesto Project)	1960-1998	Net welfare support	Exports plus imports over GDP	(1) Sum of FDI inflows and outflows over GDP; (2) Sum of inward and outward FDI stocks over GDP; (3) Index of capital openness (range 1-14)	No relation	Positive relation with (1) and (3) (controlling for their interaction with left manifestos)	Positive (10%) with trade interacted with left parties.		No relation	CH

34	Hays, Ehrlich and Peinhardt (2006?)	17 OECD countries	1960-2000	Social benefits over GDP	(1) Imports; (2) Imports x Deindustrialization (as in Iversen and Cusack); (3) Exports		Positive relation with (1). Negative relation with (2). Negative relation with (3)			LSDV	Uncertain	
				Net replacement rate (spending on unemployment insurance per unemployed over the average level of compensation per employee)			Positive relation with (1). Negative relation with (2)				Uncertain	
35	Adam and Kammas (2007)	17 OECD countries	1970-1997	Welfare spending over GDP	Exports plus imports over GDP, corrected by country size		Positive		No relation (after controlling for terms-of-trade)		CH	
				Non-welfare spending over GDP			No relation				No relation	
				Transfers expenditures over GDP			Positive		No relation (after controlling for terms-of-trade)		CH	
				Non-transfers expenditures over GDP			No relation				No relation	

	Author(s)	Countries	Period	Dependent variable	Trade openness measure	Capital openness measure	Sign of the relation with trade integration	Sign of the relation with capital integration	Additional issues	Main estimation methods	Trade integration mainly consistent with ...	Capital integration mainly consistent with ...
36	Gemmell, Kneller and Sanz (2008)	25 OECD countries	1980-1997	Nine expenditures categories (as a *share of total expenditures*): (1) social security; (2) education; (3) health; (4) transport and communications; (5) defence; (6) public services; (7) housing; (8) economic services; (9) cultural affairs	Exports plus Imports divided by GDP	Inward stock of FDI as a share of GDP	No relation	*Levels:* Positive with (1), (3) (10%) and (6). Negative with (2) (10%), (4), (7) and (8). *Short-run:* positive with (3) (10%) and (5). Negative with (4) and (8).	*Levels (including trade openness and FDI inward stock)*: positive with (1) (10%) and (6). Negative with (4), (7) and (8) (10%).		No relation	Uncertain
37	Jiang (2008)	23 transitional economies	1990-2005	Govt spending on welfare and social protection over total expenditures	Value of cross-border flow of goods and services over GDP	(1) FDI (both in and out) over GDP; (2) net IMF concessional financial flows over GDP; (3) net IMF non-concessional financial flows over GDP; (4) other financial flows (not related to IMF); (5) per capita foreign aid; (6) external debt	No relation	Negative with (2). Positive with (3). Negative with (6). No relation with measure (1).		Robust regression	No relation	Uncertain

38	Bertola, Lo Prete (2008)	Max 137 countries	1980-2003	Social policy expenditures over GDP (in logs)	Exports plus Imports divided by GDP (in logs). 5-year averages	Loan-to-value ratio (LTV)	Positive relation	No relation (one in five regressions)	The positive relation with trade is weaker (one in five regressions) when including LTV. A positive relation with trade and LTV emerges in a panel analysis. Robust to OLS, FE and RE	Cross-sectional analysis. Panel analysis with OLS, FE and RE	CH	No relation
39	Benarroch, Pandey (2009)	120 countries	1972-2000	Defence	Exports plus Imports divided by GDP (in logs and lagged)		No relation			FE	No relation	
				Education			No relation				No relation	
				Health			No relation				No relation	
				Social Security			Positive relation				CH	
				Housing			No relation				No relation	
				Economic services			Positive relation				CH	

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