

One of the most striking features of the 20th century is the massive growth of government in Western style democratic countries, c.f. table 1¹. In the 19th century, governments rarely spend more than 15 per cent of GDP in peacetime. From 1900 until recently, governments have expanded to spending around a third to half of GDP in 2019. The expansion was especially strong in the 1960s to 1980s and has since then levelled out in most countries².

Table 1

Public Expenditure (% of GDP)

	About 1870	1913	1920	1937	1960	1980	1990	2000	2019
Australia	18,3	16,5	19,3	14,8	21,2	34,1	34,9	35,9	35,9
Austria	10,5	17,0	14,7	20,6	35,7	48,1	38,6	51,6	48,6
Canada	...	...	16,7	25,0	28,6	38,8	46,0	44,7	41,5
Denmark	9,0	10,0	...	15,9	23,6	52,3	54,9	52,7	49,7
France	12,6	17,0	27,6	29,0	34,6	46,1	49,8	55,0	54,7
Germany	10,0	14,8	25,0	34,1	32,4	47,9	45,1	49,1	44,4
Italy	13,7	17,1	30,1	31,1	30,1	42,1	53,4	52,7	48,5
Ireland	...	...	18,8	25,5	28,0	48,9	41,2	42,0	24,2
Japan	8,8	8,3	14,8	25,4	17,5	32,0	31,3	35,9	38,4
New Zealand	...	...	24,6	25,3	26,9	38,1	41,3	34,7	40,6
Norway	5,9	9,3	16,0	11,8	29,9	43,8	54,9	49,2	51,6
Sweden	5,7	10,4	10,9	16,5	31,0	60,1	59,1	64,2	48,1
Switzerland	16,5	14,0	17,0	24,1	17,2	32,8	33,5	39,4	32,8
United Kingdom	9,4	12,7	26,2	30,0	32,2	43,0	39,9	43,0	40,2
United States	7,3	7,5	12,1	19,7	27,0	31,4	32,8	32,4	36,5

Sources: <https://data.imf.org/?sk=a0867067-d23c-4ebc-ad23-d3b015045405>, Tanzi and Schuknecht (2000), *Danmarks Statistik (NAN1 & OFF3)*, *OECD (2019)*, Hansen (1984)

Note: Denmark: 1870 and 1913 is per centage of Gross Factor Income. 1937 is 1938.

¹ The working paper has been prepared as an entry in Elgar Encyclopedia of Public Choice (forthcoming).

² 2019 has been chosen as the end year, ignoring the strong expansion in spending during the COVID 19 pandemic.

It is worth noting that governments grew relative to GDP even though GDP itself grew substantially; GDP per capita is typically around 7 to 10 times higher today than in 1900 (Maddison Project Database 2020). In fact, some of the most rapid expansion of government relative to GDP took place, when economic growth was at its highest.

A prominent theory which seems able to identify a major driver behind the expansion of government spending is the Baumol effect or cost disease (Baumol, 1967; Baumol and Bowen, 1966). An economy, where one or more sectors lag other sectors in productivity growth, could see the low productivity growth sectors swamp the progressive sectors if low productivity growth is compensated for by using more production factors. In the progressive sectors, a lesser share of the production factors of the economy is needed to produce the same or even an increasing output. This has very much been the case in agriculture versus the rest of the economy for centuries. A constant increase in relative productivity has allowed a declining share of the workforces to provide the rest of the economies with ample food.

As opposed to agriculture (and manufacturing), government services are often assumed to exhibit low productivity growth, due to being labour intensive and less able to raise productivity by adding capital. However, productivity is hard to measure in the absence of market prices, and government services are usually not priced by market prices. Until recently government consumption was measured in national accounts by inputs rather than outputs, implicitly assuming away productivity increases. Output based measures of government consumption are still very rudimentary compared to those of private consumption.

A simple cost disease model

To illustrate the Baumol effect, assume a simple economy with two sectors producing government consumption, G , and private consumption, C , with a single production factor labour, L .

$$Y = G + C = L_G + EL_C \quad (1)$$

The price of C is assumed given at 1. E is a labour productivity index, growing by a constant exogenous rate, $q = \frac{dE}{dt} \frac{1}{E}$. Productivity is assumed to grow in the C sector only, but the conclusion holds as long as its productivity growth is higher than that of the G sector.

A crucial assumption is that wages, W , are determined by productivity in the productivity growth sector, C^3 .

³ Under perfect competition and as labor is the only factor of production, the wage bill will be equal to the entire turnover.

$$W = \frac{C}{L_C} = E \quad (2)$$

In the low productivity G sector, wages are the same as in the high productivity C sector, since the low productivity sector would otherwise be unable to attract sufficient labor (at the margin being indifferent between working in the two sectors).

The tax rate necessary to finance public consumption is simply equal to G/Y (ignoring other government spending as well as government deficits), which in turn is equal to the government labor share:

$$\tau = \frac{G}{Y} = \frac{WL_G}{WL_G + WL_C} = \frac{L_G}{L_G + L_C} \quad (3)$$

For simplicity, further assume that real government consumption is held constant relative to private consumption, which implies

$$c = \frac{L_G}{EL_C} \rightarrow L_G = cEL_C \quad (4)$$

The constant relationship is not necessary for the conclusions we reach in a moment. However, it is necessary that the (political) demand for G is inelastic. In the case of elastic demand, the opportunity cost of G in terms of foregone C , would decrease demand by at least as much as the relative productivity declines over time.

Finally, insert (4) in τ :

$$\tau = \frac{cEL_C}{cEL_C + L_C} = \frac{cE}{cE + 1} \quad (5)$$

As can readily be seen, $\tau \rightarrow 1$ as $E \rightarrow \infty$. Remembering that τ equals the tax rate, the share of public consumption expenditure to GDP as well as the labour share of G , the conclusion is quite clear. Eventually, government spending will crowd out private consumption spending, as the tax rate approaches 100 per cent. While real government consumption is constant relative to private consumption, government spending will increase until it swallows all income, and the government sector at the limit swallows all labor. Furthermore, this dynamic will be true, as long as c is non-zero. Even countries with a small initial government sector will see the same expansion, but at a slower pace.

Modifications

Even if realistic modifications are made, the Baumol effect will drive up government spending, until it reaches some limit. First, if a Laffer point exists on the tax/revenue schedule below one hundred per cent, the tax rate will approach this limit, since increasing the tax rate beyond this point would decrease revenues and thus decrease government consumption, too. In the case of a proportional tax, the Laffer point can be calculated as the revenue maximizing tax rate

$$\tau_{max} = \frac{1}{el(L, w) + 1} \quad (6)$$

where $el(L, w)$ is the elasticity of the tax base. In the case of a progressive tax, the revenue maximizing tax rate is

$$\tau_{max} = \frac{a}{el(L, w) + a} \quad (7)$$

where a is the fraction of income (or other tax base) above the tax brackett. In the progressive case, the average tax rate is even lower⁴. The average rate determines the maximum size of the public sector, cf. (3).

According to the *Leviathan hypothesis* by Brennan og Buchanan (1980), the “constitutional” design of the tax system is the limiting factor to taxation and, ultimately, public spending.

Secondly, if part of the private sector is also exhibiting the same low or no productivity growth as the public sector, public consumption will not in the limit crowd out all private consumption; however, the low productivity growth sectors in tandem will crowd out the progressive sectors, and their relative labor shares will determine the long run tax rate (unless the Laffer point has already been reached). Furthermore, tax increases can be postponed by government deficit finance, but like taxation, government debt can inhibit growth increasingly, as the debt ratio increases. Thus, there would be a limit to deficit finance just as to tax finance.

The Baumol effect will also be modified if close enough substitutes to the output of the low productivity sector exist or are developed. Many goods have become technical obsolete, as high productivity alternatives have emerged. However, if a large sector of the economy, such as the government sector, is systematically low productivity growth, near substitutes are less likely to emerge. Especially if, as most often the case with public provision, the provider enjoys a monopoly and is not subject to normal selection forces of the market.

⁴ Depending on the tax rates in lower brackets.

Finally, even if governments spend tax revenues on other expenditures such as transfer payments (or by foregoing revenue by progressive taxation), these outlays will come under pressure from the Baumol effect. Thus, the force of the Baumol effect could put politicians in a welfare state in a trilemma of choosing between declining real relative government consumption, increasing taxes towards their upper limit or limiting redistribution (Birch Sørensen, 2016). In the end, real relative government consumption will have to give.

Does the cost disease tell the full story?

The dynamics implied by the Baumol effect *prima facie* seems to fit the development in Western democracies for more than a century remarkably well. As we saw, government spending expanded especially until the 1980s, whereafter spending to GDP levels have been more stagnant. Also, disposable income inequality, as measured by the Gini coefficient, have been rising in recent years, while tax systems have come under pressure. Many countries have introduced major tax reforms since the 1980s (Brøns-Petersen, 2017) (but marginal income tax rates are close to the top of the Laffer curve in a number of countries, according to e.g. Lundberg (2017a)). Becker and Mulligan (2003) found that countries with more efficient tax systems tend to have higher levels of government spending.

The Baumol effect itself has been identified and confirmed in a number of empirical studies of public sector growth. Gemmell (1993) provide an overview. Borge m.fl. (2018) find Baumol effects in defense and public administration in Norway. Köppl-Turyna, Kucsera, and Neck (2017) find that prices of public consumption have increased strongly relative to private consumption prices in post-war Austria, while demand has been price inelastic, both consistent with the cost disease. Nordhaus (2006) identifies Baumol effects for the overall US economy 1948-2001.

So apparently, a completely technical feature of the economy, viz. a difference in productivity growth between the public and private sector, could explain the rising trend in government spending in Western democracies for more than a century, at least until upper limits of taxation has been reached. This limit could depend on simple technical features relating to labor supply and tax system design issues, determining the elasticity of taxable income.

On closer inspection, the purely technical explanation looks less convincing, however.

First, like the overall growth of government during the last century, another feature of Western democracies has been an increase in the *scope* of government. Modern welfare states do not limit themselves to providing public goods and dealing with other “market failures” (providing goods such as national defense, law and order, environmental regulation, and roads).

While the “publicness” of certain goods is the *raison d’être* for government provision in the public finance tradition (what Musgrave and Musgrave (1976) dubbed the “allocative function of government”), most of contemporary government consumption consists of private goods, that is

they are consumed by individuals individually. As is evident from Table 2, most government spend two to three times as much on private goods than on goods consumed collectively. (The latter category is wide, as it includes all government consumption which cannot be attributed to individuals, including administrative costs.) In fact, it is striking that almost all the governments listed spend almost an identical fraction of GDP on non-private goods of around 7 per cent. Conversely, government spending on private goods varies substantially.

Table 2
Public Consumption (% of GDP)

	2019		
	Final consumption expenditure	Of which individual consumption expenditure	Of which collective consumption expenditure
Australia	20,9	13,1	7,7
Austria	19,5	12,4	7,1
Canada	20,8	13,0	7,9
Denmark	24,1	17,0	7,1
France	23,0	15,0	8,0
Germany	20,3	13,1	7,3
Italy	18,6	10,8	7,8
Ireland	12,0	8,1	3,9
Japan	19,9	12,2	7,7
New Zealand	18,9	11,8	7,1
Norway	24,3	16,4	7,9
Sweden	25,8	18,6	7,2
Switzerland	11,2	6,3	4,8
United Kingdom	18,8	12,2	6,6
United States	13,9	6,0	7,9

Source: OECD

Also, government consumption in total adds up to only around half of total government spending (which can be seen from comparing tables 1 and 2). The main difference is due to redistributive transfers, and - to a lesser extent - investments and interest payments. Spending statistics even underestimate the degree of redistributive spending, as design of tax systems is also used for this purpose.

The widening scope of government can hardly be explained by the Baumol effect. Rather, if the comparative disadvantage of government production is increasing over time due to this effect, one should expect the scope to shrink. So clearly, something else than the cost disease must have been at work too.

While the Baumol effect is no doubt an important one, it almost completely leaves out the demand side (except from the inelasticity assumption). The production of government consumption goods must, however, be decided by acts of public choice by decisionmakers in the political system. Unlike private consumption, which is provided by profit maximizing producers as a simple response to demand from individual customers, public consumption requires political decisions about production, finance, explicit allocation, and organization. The institutions channeling those decisions in turn could play a key role for the growth as well as the cost of government.

Demand side explanations

In the simplest case, demand for government services in a democracy is determined by median voter preferences. The idea is that, under given conditions, the median voter is the most mobile between possible majority coalitions, and hence the winning coalition must adopt the median voter position in order to attract the median voter, or else it is not a winning coalition. In the standard model, the median voter will demand collective goods until the marginal utility equals the tax price, viz. the marginal tax plus the distortionary loss from taxation. If the median voter tax share is less than its share of the total marginal utility, this equilibrium will entail a subsidy to the median voter. However, if the median voter has the alternative option of direct redistribution rather than via the financing and consumption of public goods, this option should be preferred, since it involves less efficiency loss, and public goods should be financed by non-distributive, non-distortive taxes. By the same token, the median voter should never in a first-best setting choose public provision of private goods, if it involves efficiency losses compared to cash transfers.

Conversely, in a second-best environment transfers by way of publicly provided private and public goods could be an option (see e.g. Besley and Coate 1991). However, since tax and redistributive capacities of modern democratic states have increased drastically during the 20th century, the second-best explanation for the expansion of government consumption is not very convincing.

Even if strongly influential, median voters depend on politicians and bureaucrats to carry out their wishes. They consequently face a number of principal agent problems. The discretion offered to agents provide opportunities to pursue their own interests, e.g., by creating rents to themselves and their clients. In reality, institutional settings, competition for electoral support, special interests and political entrepreneurship play important roles determining the demand and supply of publicly provided goods and services. The public choice literature is very rich in this theoretical field.

An important distinction must first be made between explaining the *level* of government activity and its growth over time. Most theories are static and characterize the equilibrium outcome of public

choices (as is the median voter theory). Since taxation and spending decisions often involves externalities on outsiders, and since rent-seeking is a costly activity, the equilibrium outcome is often inefficient. However, it does not necessarily involve growing costs and spending over time. On the contrary, the intuition might be that any room for efficiency losses over time would be turned into even bigger rents to begin with.

There are some theories which do, however, involve growing costs and spending over time.

Mancur Olson (1982, 1965) proposed a dynamic by which interest groups build gradually, as they overcome collective action problems. To begin with, this could happen by supplying members with private goods (such as labor unions providing unemployment insurance). Once the group is established, it can also be used for rent-seeking. As political institutions mature, special interest will become increasingly powerful and shift its activities from private goods provision to rent seeking.

Higgs' (1987) historical study of expansions in US government lead him to identify a ratchet effect in spending: it increased during crisis episodes, mainly the depression and two world wars, but failed to recede after the crisis. Peacock og Wiseman (1961) similarly identified a ratchet effect in spending in the UK.

Wildavsky (1964) pointed out that government budgets tend to grow by way of incrementalism, because the deciding agents due to bounded rationality do not take a strategic or optimizing approach.

One way of understanding the gradual growth of spending is through the transaction cost involved in forming and maintaining an organization or coalition. The transaction costs of running an existing organization are usually lower than of establishing one. This is no less true for a government bureau than for an interest group such as a union or a coalition of interests. In the classical bureaucracy theory (Niskanen, 1971), bureaus are assumed to maximize their budgets, and to utilize their information monopoly to do so by overstating fixed costs and understating their marginal costs, leading political sponsors to dedicate more funds than they would, given true cost information. The information monopoly is probably stronger in the case of an existing bureau rather than a perspective one, and so is the position to possibly coordinate with other interests.

As we saw, in the case of private goods, consumers-voters would be better off by receiving a transfer rather than a “free” or subsidized public provided good. Non-price allocation leads to a welfare loss, public monopolies tend to produce at higher costs and consumer sovereignty is weaker than in a standard marketplace. So, it is highly likely that interests on the supply or production side rather than the consumer-voter demand side play a dominant role in the expansion of government consumption spending.

A re-interpretation of the Baumol effect

Rent-seeking by special interests not only provides an alternative demand side explanation to the supply side Baumol effect to government expansion. It also offers an alternative interpretation of the Baumol effect itself. Interestingly, Baumol came close to realizing this in another well-known contribution to economic theory (Baumol, 1990). In his 1990 article, he speculated that differences in productivity growth historically could be explained by the allocation of talent to innovation vis-à-vis rent-seeking. If society offers better pay-offs to rent-seeking than innovation, less innovation and productivity growth will take place. Baumol found examples in for instance the Roman and Chinese

empires and speculated that litigation could offer a contemporary example of rewards to rent-seeking.

However, he mostly ignored the rent-seeking taking place by interest groups in relation to public spending and public provision of goods and services. If organizations on the supply side, especially government bureaus, are the main driver of decision making, they will most likely not only hamper static efficiency but also efficiency in the dynamic sense. Schumpeterian creative destruction, cited favorable by Baumol, is driven not only by scrapping capital, but by the death and births of new firms too. Creative destruction thus involves unpredictable shifts in entrepreneurial rents and influence. That is why authoritarian governments tend to allow less innovation (Acemoglu and Robinson, 2013; North et al., 2006), as these shift could erode their powerbase. Similarly, existing bureaus could be reluctant to accept major organizational changes, not to speak of entirely reorganizing production, or “recombinations” to use a Schumpeterian phrase. Even the introduction of improvements such as new IT technology might involve mostly downside risks to the bureau, even if upside-chances clearly dominate from a social perspective.

While ignored by Baumol, Buchanan (1977) did point out that government provision and decision making could be the underlying reason for an observed Baumol cost disease rather than something intrinsic to the factor intensities of the goods and services themselves.

The supply and demand side explanations for sluggish public sector productivity growth are not mutually exclusive. Empirical tests of their relative are scarce and difficult to interpret. Borge m.fl. (2018) in a study of Norwegian defense and public administration find that the Baumol cost disease played a major part in cost increases, while demand side effect measured by leadership fragmentation and ideology also contributed, but to a lesser extent. However, the study does not address the role played by being part of the public sector as such, and only two of the possible factors influencing the demand side are examined. But the authors do find a cost disease in the private sector (restaurant etc.) as well.

Cost disease and prospects for reform

The prospects for policy intervention and reform do partially rely on whether the Baumol effect is driven by supply or demand side factors. In both cases, privatizing government provision of private goods could have a favorable economic effect, albeit for different reasons. In the case of political driven costs, privatizing demand and introducing competition in supply, would reduce costs pressures. In the case of supply induced costs, privatization of finance - either by market prices or user fees - would reduce the negative economic impact of high (marginal) taxes otherwise necessary to finance production. Even if Baumol’s cost disease should still exists after privatization, welfare costs from the tax side will be alleviated.

But in the case of cost diseases relating to government provided public goods, privatization is more complicated. Assuming that the financial side cannot be privatized (a standard assumption for public goods), privatization will not reduce a supply-side Baumol effect, whereas privatizing the production side - by contracting out to the most efficient bidders - could reduce a demand side induced Baumol

problem. Contracting out needs, however, to be more efficient, as interest groups in the private sector could also be a source of rent-seeking driven Baumol costs.

Introducing successful productivity enhancing measures in the public sector would ease cost pressures in both the demand and supply case.

However, in the long run, problems and solutions will be very different in the two cases.

A Baumol effect arising from the supply side will sooner or later inflate costs, until some limit on the financial side is reached or the non-progressive sectors swamp the entire economy. Unless substitutes to non-progressive sector output emerge to a degree to make demand elastic, the long run prospect for the economy is quite dismal. Just like it was once expected that declining marginal productivity in the agricultural sector would eventually force living standards, population numbers or both to decline. Only, in agriculture turned out to be a progressive sector.

A Baumol effect arising from the demand side, from political decision making that is, is in principle curable by privatizing production. The question is, however, what it takes. Is the ratchet after all reversible? Becker (1983) theorised that the success of an interest group would depend on the efficiency cost of accommodating it. The higher the efficiency cost, the less likely would it be to achieve its goals. In that case, a constant rise in the efficiency cost of public provision could eventually create a political climate favourable to privatisation. But, as argued by Olson (1982) the cost of organising special interests could be more important than efficiency costs, keeping public provision in place even at rising efficiency costs. From a constitutional economics perspective, Buchanan and Tullock (1962) argued that political outcomes depend largely on the constitutional framework. Once the constitutional rules are in place, they tend to determine the policy outcome. The prospect for reform would thus depend on reforms to restrain Leviathan. This could happen from both the provision and the taxation side. Limits to taxation, as proposed by Buchanan, could reduce the scope for government spending, while a more direct way to deal with Baumol problems could be a constitutional ban on government provision of private goods. Even limits on government borrowing could reduce Baumol problems by limiting the prospect for financing present day expenditure by placing burdens on future generations, as could the implementation of budget rules and independent benchmarking institutions.

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