ECONOMIC OPENNESS AND PUBLIC EXPENDITURE IN CHINA: A REGIONAL ANALYSIS

by

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Summary

The transition of China towards a market economy was accompanied by a vast fiscal decentralisation movement. Econometric analysis of the determinants of budgetary and extra-budgetary expenditure of the provinces does not permit us to reject the hypothesis that the provinces observe a similar behaviour to governments of developing economies which are significantly affected by external shocks and that, in order to alleviate external risk, the provinces take control of a more significant share of the revenues of the economy.

Introduction

"Why do more open economies have bigger governments?" In a recent article, D. Rodrik (1998) asks this question showing, at an international level, a robust positive link between commercial openness of economies and the extent of their public expenditures. At the same time, he offers an explanation according to which governments use public expenditure to provide protection or social insurance against external risk.

Before Rodrik, D. Cameron (1978) had studied this relationship for 18 OECD countries. What is original in Rodrik's article is that it rests on a much larger sample of countries (more than one hundred), including developing countries, and that it offers a general explanation of the function of public expenditure in social insurance: it is not just social expenditure which depends on the more or less large openness to the outside (see Cameron), but the entirety of public expenditures. Based on a simple theoretical model, he shows how an increase in the risk linked to export activities, notably due to the instability of the terms of exchange, justifies "a reallocation of the economy's resources towards the safe activity (government), even when the return to government activities lies below the (mean) return to other activities[2]".

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[2] Rodrik (1998) p 1014. This argumentation is one of many studies relative to different countries which show that governments try, in general, to compensate for the negative consequences of openness for certain categories of economic agents by means of diverse public expenditures (Katzenstein, 1984 and 1985; Maravall, 1993; Marcel and Solimano, 1994).

This positive relationship between foreign trade exposure and the extent of government intervention would, *a priori*, seem surprising. Indeed, as D. Rodrik himself underlines, it is generally suggested that, as the relative efficiency of government intervention is lower in economies with a high level of integration in the world economy, public expenditure should also be lower here. In many developing countries, the policy of openness to the outside carried out since the beginning of the eighties is part of a vast programme of economic liberalisation and often of privatisation of activities formerly carried out by public entities responsible to the state. This is why it would appear interesting to study whether or not this positive relation holds for developing countries which have combined exterior openness and economic liberalisation to a very high degree. In this respect, the Chinese experience seemed to be a pertinent sphere of investigation.

Over the past twenty years, the Chinese economy has progressively transformed into a market economy. The two main manifestations of this transition are the development of non-state enterprises[3] and the growth of foreign trade. They are clearly shown in figure 1, which shows the evolution of the share of employment in the non-state sector for the whole of China from 1980 to 1998, as well as that of the ratio of foreign trade (exports and imports) to the gross domestic product. We can thus note that, for the whole of the considered period, the rate of non-state employment rose from 13% to 34.1% and the rate of openness from 18% to 33.8%.

A second phenomenon which marked the economic evolution of China at the same time was the vast decentralisation movement which accorded more and more autonomy to the provinces with respect to economic policy decisions, especially to their budget management[4]. This progressive decentralisation occurred mainly between 1985 and 1994, as seen in figure 2, which shows the evolution of the rate of public expenditure (compared to the GDP) by the central government on the one hand and the entirety of the provinces on the other. Thus, in 1998, 71% of public fiscal spending was made by the provinces.

[3] The non-state sector includes all of the companies whose capital is not owned by a government situated at the central, provincial, prefecture or canton level. It regroups rural and urban co-operatives, town and village enterprises (TVEs), private enterprises and companies with foreign or mixed capital.

[4] China is composed of 22 provinces (Hebei, Liaoning, Jiangsu, Zhejiang, Fujian, Shangdong, Guangdong and Hainan, Shanxi, Jilin, Heilongjiang, Henan, Anhui, Hubei, Hunan and Jiangxi Gansu, Shaanxi, Sichuan, Guizhou, Yunnan and Qinghai), four autonomous municipalities under the direct control of the central government (Beijing, Tianjin, Shanghai and Chongqing), and five autonomous regions (Guangxi, Inner Mongolia, Ningxia, Xinjiang and Tibet). In our econometric analysis, the autonomous region of Tibet is absent due to a lack of statistics; the statistics for Chongqing, created in 1997, were included in those of Sichuan, which leads us to consider 29 provinces in total.

The tendency of falling central government public spending rates mainly results from the decrease in productive investment (which is henceforth the responsibility of the companies), although it also results from the fiscal decentralisation which led the provinces to assume an ever-increasing share in public expenditures. As the rate of openness of the Chinese economy experienced an increasing trend over the same period, a negative relation appears in time between central government public spending and openness. This relation would suggest, according to the traditional hypothesis, that the reduction in the share of resources under state control contributed to the improvement in productivity and, together with the severe real depreciation of the exchange rate, to the improved competitiveness of the Chinese economy and to its openness to the outside (Guillaumont Jeanneney and Hua, 1996). This temporal relation is not incompatible with the existence of a transversal relation whose causality and sign are inverse between the exterior openness of each province and its public expenditure.

Figure 1: Evolution of the rate of non-state employment and of the rate of openess in China

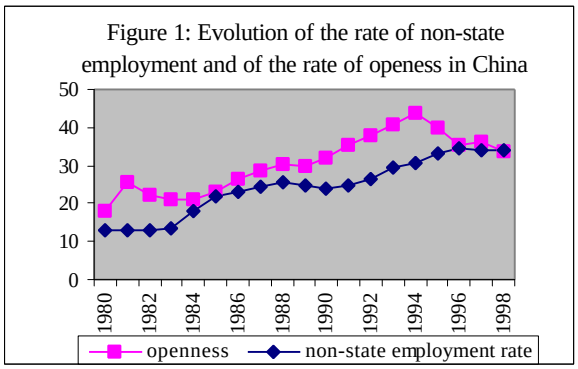
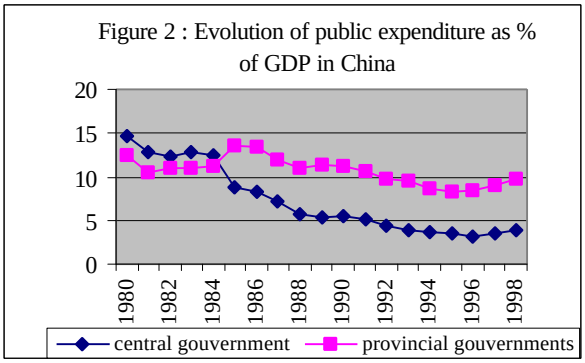


Figure 2 : Evolution of public expenditure as % of GDP in China



By studying if the Chinese provinces have followed the international model with respect to their public spending policy since acquiring their autonomy, we aim both to confirm the idea that China should not be considered as a monolithic country, but as a series of states which are relatively autonomous in their economic policy decisions, and to contribute to an improved knowledge of the determinants of public expenditure in transitional economies. This analysis is all the more interesting to us as the fiscal decentralisation in China comes after more than 2000 years of a centralised fiscal system (Fan, 1999).

There are three parts to the analysis. After having considered the basic hypothesis of our model, which is the fiscal autonomy of the provinces, we show the existence of a positive econometric relation between the rate of public expenditure and openness to international trade for the different provinces, while at the same time controlling for the traditional

economic and demographic determinants of public expenditure, such as per capita Product, population density and urbanisation. In the second part, we verify the robust character of this relation by introducing a certain number of variables which capture the transition of the Chinese economy towards a market economy, and we show that the inclusion of these variables does not significantly affect the positive relation between the rate of public expenditure and foreign trade exposure. Finally, in the third stage of the paper, we explore the channels by which exterior openness can affect public spending, so as to test D. Rodrik's hypothesis against a more traditional explanation based on a ratchet effect for public expenditure in a context of unstable fiscal revenues. In the end, econometric analysis confirms the hypothesis relative to the role of social insurance of public spending against external risk.

1. Openness, a positive factor of public expenditure in the Chinese provinces?

The basic hypothesis of our model is that the Chinese provinces have acquired an autonomous fiscal power which allows them to determine the sum of their own spending. This hypothesis deserves closer examination. As the provinces should, in theory, present a balanced budget, their autonomy as regards budgetary spending depends on their autonomy with respect to fiscal revenues.

Before 1979, China practised a *unitary fiscal system* (*tongshou tongzhi*): the central government controlled all central and local revenues and the spending programmes of the provinces had to be submitted to the strict controls of the centre. This system, coherent in a planned economy, was not compatible with the economic reforms launched in 1979. A fiscal decentralisation policy was implemented in 1980, whose modalities changed many times, with a clear rupture in 1994. Although the central government still maintained the responsibility for defining the fiscal system so that the rate of taxation and the fiscal bases remained uniform for the whole of China, the administration and collection of taxes was, at first, greatly devolved on the provinces[5].

Before 1994, the sharing of fiscal revenues between the centre and the provinces was the object of re-negotiation and differed from one province to another[6]. As the provinces shared the profits of fiscal effort with the centre, they were not encouraged to spend their energy collecting fiscal revenues, all the more so because they feared a ratchet effect during

[5] Until 1993, the central government did not have its own tax collection office, apart from the *State Bureau of Customs* collecting customs duties and the *State Administration for Taxation* collecting the taxes from a small number of large public enterprises (Zhang L.R. 1999).
[6] Thus in 1988, there were no fewer than six different modalities for sharing fiscal revenues.

the re-negotiation of fiscal contracts with the centre (Cullen and Fu, 1998; Fan, 1999). The provinces easily accorded exonerations to local public companies on which they exercised strict control, even though the fiscal revenues themselves came for the most part from these companies (Du and Feng, 1994). The result was a variable application of taxation from one region to the next (Lampton, 1987, Zheng, 1994) and a rapid reduction in revenues owning to the central government, which found itself little by little dispossessed of the fiscal section of macro-economic policy.

The 1994 reform aimed at stopping this evolution with a view to reinstating a greater degree of fiscal centralisation (Balh, 1999). Two essential principles were adopted: 1) the system of fiscal revenue sharing was replaced by a *system of allocation of the different categories of taxation between the centre and the provinces (Fenshuizhi);* 2) the centre and the provinces became responsible respectively for the administration and collection of taxes belonging to themselves[7]. The provincial governments did not readily accept the sharing of fiscal revenues as it proved less favourable to them. They obtained automatic transfers from the central government according to a clearly defined principle of calculation[8].

Did the new fiscal regulations diminish the fiscal autonomy of the provinces? It is certain that the fiscal liberty of the provinces was reduced in the respect that they could no longer establish fiscal contracts with the companies and accord them exonerations as an instrument of their industrial policy or as a recompense for investment in infrastructure. The share of fiscal revenues available to the central government increased, which was the objective of the reform. However, in certain aspects the reform was able to reinforce the fiscal autonomy of the provinces. Firstly, the sharing of tax revenues between the centre and the provinces became automatic and homogenous for all the provinces: in this way, the revenues of the provinces no longer depend on the negotiation of random results with the centre, which should permit them to have a better programming of public expenditure. Secondly, the taxes which were left to the provinces have a significant fiscal potential: these are taxes on company profit for the most dynamic companies, private and collective, on personal income and property tax. The new law leaves the provinces a certain discretion in the administration

[7] The central government allocated itself taxes raised from the revenues of public enterprises under its control, customs duties, consumer tax and 75% of VAT; the provinces receive 14 different taxes, of which the main one remains income tax on local enterprises.

[8] The sum of the transfers depends on the one hand on the 1993 level of fiscal revenues for the provinces, and on the other hand on VAT revenues and consumer taxes collected and kept by the central government (*Shui Shou Fan Huan*) (Wong, 1997). Moreover, the fixed sums of prior transfers (in either sense) are maintained (Zhang H.L., 1999). To certain automatic transfers, can be added central government subsidies to the provinces effected to specific projects (infrastructure projects, subsidies for goods of primary necessity in the towns, emergency funds, education and healthcare projects in the poor provinces).

of these taxes, as it is very difficult for the central administration to control an activity as vast as local fiscal administration (Balh, 1999)[9]. Thirdly, the provinces benefit totally from the revenues that they collect themselves: this leads them, thus, to adapt their collection effort to the desired level of their fiscal expenditure. This liberty of the provinces is characterised by an extremely different fiscal effort from one province to the next (Balh, 1999)[10].

The fiscal autonomy of the provinces also appears in the frequent existence of deficits during the execution of budgets. These deficits can be justified by a natural catastrophe or an over-estimation of economic growth. However, it seems that they are sometimes deliberate, as expenditure previsions are not realistic and thus the budgetary balance is not respected (Agarwala, 1992; Balh, 1999). The budgetary deficits are financed by subsidies or loans from the central government, by extra-budgetary funds from the provinces or by short-term bank loans.

Even if the provinces have a capacity to choose the level of their budgetary expenditure which is subject to controversy, it is accepted to consider that they have great liberty with respect to the amount of their extra-budgetary spending. This is financed by extra-budgetary revenues, made up of rights and fees for public services, fines and, since a few years ago, part of the revenue linked to the sale of land. Despite their name, these revenues are nonetheless of a budgetary nature, since the provinces formally anticipate their collection and spending, and they are officially known to the central government[11]. The development of extra-budgetary financing shows the tolerance of the central government towards the initiatives of the provinces with respect to local public services (Zhang L.R., 1999).

Also in the following analysis, we have considered the rate, compared to the GDP of each province, not only of its budgetary spending but also of the total of its budgetary and extra-budgetary spending[12]. If we show that the determinants of these two series of provincial public spending rates are identical, we confirm the hypothesis of autonomy of the provinces with respect to budgetary expenditure in its strictest sense.

[9] In this way, the provincial administration determines the standard deductible salaries, fixes tax rebates, decides on tax collection for use of land and for business dinners and on taxes on animal slaughter.

[10] Fiscal effort is measured as the ratio of per capita revenue observed in each province to their estimated value according to per capita product for the population, which is supposed to represent the fiscal potential. This ratio is situated between 0.67 and 1.6 (Balh, 1999, p124).

[11] With respect to audits and accountancy, extra-budgetary revenues and expenditure are treated in the same way as their budgetary homologues (Fan, 1999).

[12] Budgetary expenditure is published regularly in *China Statistical Yearbook*, whereas extra-budgetary expenditure is found in the *Finance Year Book of China*, 1999. In China, subsidies to public enterprises are considered as fiscal loss; in order to follow international practice, we added these subsidies to budgetary expenditure.

However, alongside these budgetary and extra-budgetary expenditures, there also exists off-budget spending, also called "extra-extra-budgetary spending", which is financed by para-fiscal revenues, such as the transfer of profits from rural companies, rent from property, fines and fees for various informal public services and voluntary contributions from individuals and companies, notably Chinese non-residents (Fan, 1999). These off-budget funds are collected locally without the authorisation of the central government in the sense that no law has anticipated them. They are sometimes used to finance administrative expenditure, especially in the poor provinces, but they are most often used to complete development projects (West and Wong, 1995, and Fang, 1999). Even if the off-budget expenditure goes far beyond the traditional function of public service and, in general, corresponds to commercial activities, it would have been interesting to apply the same analysis to this spending as to budgetary and extra-budgetary spending. For the lack of the necessary statistics, as these expenditures are largely informal, we calculated the amount of state budgetary appropriations and fundraising financed by extra-budgetary or off-budget resources[13], the latter corresponding mainly to the self financing of public enterprises, local authorities and administrative agencies (Zhang, 1999), which approximately covers the sum of public investments decided by the central state or the local authorities of each province. We applied *in fine* the same analysis to this variable as to public spending (cf. S3).

Bearing in mind the multiple changes in the Chinese legislation, we concentrated our analysis on the relation between openness and provincial public spending for the period 1996-1998. The choice of this recent period is justified by the fact that, contrary to previous fiscal reforms, the reform of 1994 implemented a transparent and objective fiscal policy, more likely to encourage the provinces to lead a budgetary policy related to their own interest. Moreover, an autonomous fiscal policy required a learning period[14]. Finally, the statistical constraints relative to exterior openness of the provinces also contributed to the choice of this period.

Foreign trade exposure of the Chinese provinces was measured, as in D. Rodrik's analysis, by the ratio of the sum of imports and exports of each province to their gross domestic product. Taking the idea to its very limit that each Chinese province constitutes an independent state, we could have tried to measure the openness of each province by also taking into account its commercial relations with the rest of China (Combe, Guillaumont and

[13] Based on table summarising different financing sources of investments made in each province in *China Statistical Yearbook.*

[14] Almost two years were required to implement the 1994 reform (Wong, 1997).

Poncet, 2000). However, our hypothesis here is to estimate the impact of external risk (linked to the instability of the international goods markets) on the spending behaviour of the provinces, all the more so because trade between the provinces remains strictly regulated at the current time[15].

So, the data for the foreign trade of the provinces, published in *China's Customs Statistics* and *China Statistical Yearbook*, are only available as of 1992, the year that China began to employ the international harmonised system allowing an improved classification of data. These data are established by the *General Administration of Customs of the People's Republic of China*, which breaks down foreign trade by province (in accordance with international criteria) according to origin of production (for exports) and final destination of products (for imports). They are noticeably different from those established for the whole period of transition by the *Ministry of Foreign trade and Economic Cooperation* (cf. *China Regional Economy: A Profile of 17 Years of Reform and Opening Up* and *Almanac of China's Foreign Economic Relations and Trade*). The differences between these two series seem to result mainly from the fact that imports and exports realised by the corporations controlled directly by the central government are not counted in the statistics of the Ministry[16]. Indeed, these corporations import particularly, and in large quantities, basic products (cereals, fertiliser, etc.) which they sell on the internal markets, these imports no doubt being considered as internal goods for the provinces (Naughton, 1999)[17]. According to the Chinese data, the openness of the provinces in 1998 varies from 4% for the Henan province to 137% for the province of Guangdong.

The rates of public spending and the rate of openness of the provinces were calculated as an average over several years so as to absorb the impact of cyclical hazards. In order to reduce the risk of endogeneity of the openness variable, resulting from an inverse causality running from public expenditure to openness, the rate of openness was calculated for a period prior to that used for public expenditure (1996-1998), i.e. the average for the period 1992-1995[18]. This temporal difference does not erase the utility of an instrumentation of the openness variable (cf., S.3).

[15] It must be added that the data relative to inter-provincial trade only concerns state trade and goes no further than 1992.

[16] The differences in the rates of openness are thus very significant, especially for the three autonomous towns, Peking (81% according to customs data and 26% according to Ministry data), Tianjin (43% and 33%), Shanghai (62% and 23%), Guangdong (124% and 60%) and Hainan (50% and 62%).

[17] The choice of customs data is all the more justified, for as of the year 2000, the Ministry refers to the same data.

[18] In this (average and temporal shift gap), we follow the analysis of D. Rodrik.

In accordance with studies carried out on the determinants of public expenditure (Ram, 1987; Heller and Diamond, 1990), we introduced a series of control variables: per capita Product, rate of urbanisation and density population, all measured in 1996. According to Wagner's law, the rate of public expenditure should increase with per capita income, but in fact in the transversal analyses (notably the analysis of Rodrik), the sign is generally inversed, i.e. negative. Furthermore, we expect that urbanisation (when it is a recent phenomenon) increases the need for public spending, as does a weak population density[19].

The results are presented in the first two columns of table 1, on the one hand for the rate of budgetary expenditure (column B) and on the other hand for the rate of budgetary and extra-budgetary expenditure (column E). In both cases, the rate of openness has a positive effect on public expenditure (with a rate of confidence of 90%), the control variables taking the expected sign.

Moreover, in columns 3 and 4, we introduced a variable which is the ratio of investments decided at provincial level compared to investments decided by the central government. This variable is supposed to measure the degree of autonomy of the provinces vis-à-vis the central government, the expected sign being positive (Boyreau Debray, 2000). It is not significant, which would seem to confirm that, during the period of analysis (1996-1998), the decentralisation of fiscal power became homogenous for the entirety of the provinces and the possibility for negotiation disappeared due to the transparency of the fiscal reform.

Finally, in order to detect the possibility of outliers, the partial correlation between the rates of public expenditure and openness in the sample of the 29 Chinese provinces, once it has been controlled by per capita GDP, urbanisation and population density (obtained from regression 1 in table 1) is shown in figure 3. It shows that the Yunnan province and the city of Shanghai could be abnormal points. However, an estimation of the regression without Yunnan and Shanghai gives the same results.

[19] The rate of dependence of the population, which is also a traditional variable of transversal studies, appeared here as insignificant. It would also have been judicious to introduce a control variable as central government public expenditure in each province, likely to influence the spending behaviour of the provinces, although the shared responsibility of spending, according to its nature, between the two levels of government is relatively clear. However, we do not have the necessary statistics.

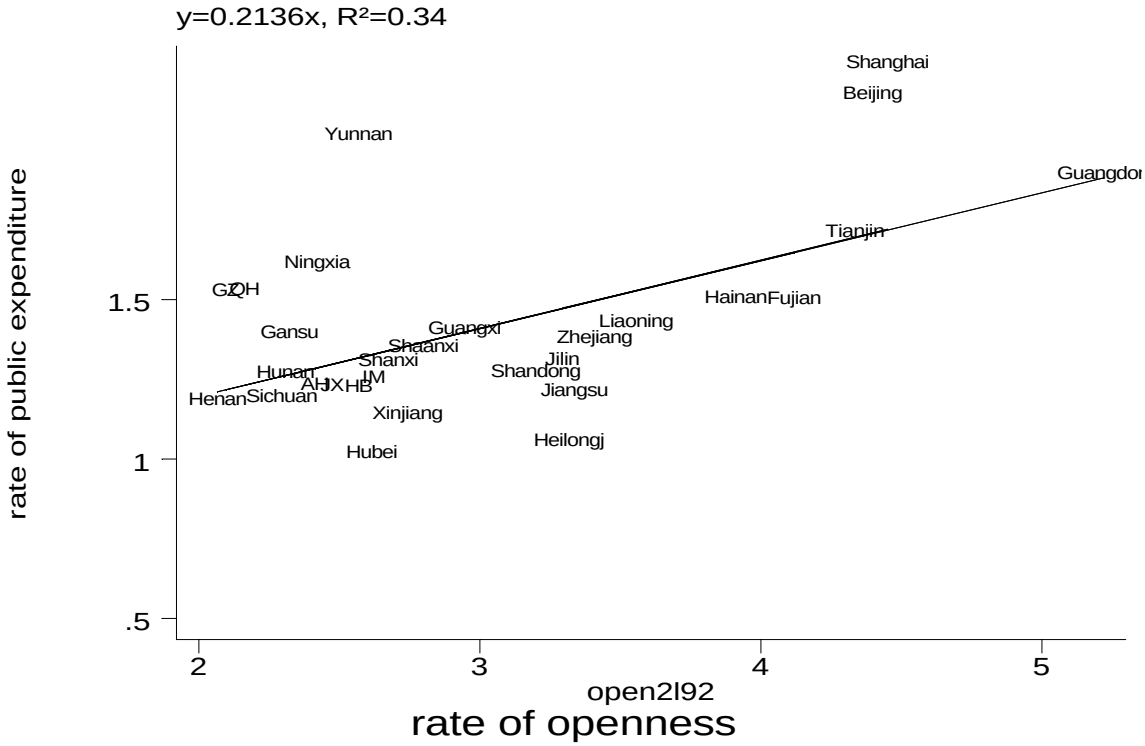
Table 1: Public expenditure and openness to the outside

	Rate of public expenditure, 9698		**Rate of public expenditure, 9698**		**Rate of public expenditure, 9698**		**Rate of public expenditure, 9698**		**Rate of public expenditure, 9698**		**Rate of public expenditure, 9698**	
	B	E	B	E	B	E	B	E	B	E	B	E
C	4.55***	4.43***	4.84***	4.55***	4.56***	4.42***	4.30***	4.26***	5.55***	5.62***	3.70***	3.80***
Openness9295	0.21*	0.17*	0.23*	0.17*	0.20**	0.15**	0.25***	0.18***	0.22**	0.15**	0.23***	0.16**
Per capita GDP 96	-0.52**	-0.39**	-0.52**	-0.39**	-0.29	-0.21	-0.39**	-0.27*	-0.58***	-0.48**	-0.41**	-0.29**
Urbanisation 96	0.38**	0.26**	0.37**	0.25*	0.40***	0.27***	0.35***	0.24***	0.34***	0.23***	0.42***	0.29***
Population density 96	-0.08	-0.06	-0.08	-0.06	-0.04	-0.03	-0.03	-0.02	-0.01	-0.03	-0.09*	-0.07*
Ratio of local/ central investment 96			-0.04	-0.02								
Non-state/ total employment 96					-0.51***	-0.40***	-0.43***	-0.35***	-0.48***	-0.41***	-0.45***	-0.37***
Rate of assisted unemployed 96							0.28***	0.18**	0.24**	0.14	0.32**	0.21**
Number of telephones as% of the population 96									0.18	0.20		
Kilometres of lines of communication as% of the area 96											0.09**	0.08**
Adjusted R^2	0.36	0.31	0.33	0.28	0.56	0.53	0.65	0.59	0.66	0.65	0.70	0.64

Note: *column A; budgetary expenditures, column B; budgetary and extra-budgetary expenditures. All variables are expressed in logarithms*
number of observations: 29; t corrections of the heteroskedasticity by the White procedure.
**** = significant at 1% level; ** = significant at 5% level; * = significant at 10% level.*

Figure 3

Partial correlation between the rates of budgetary expenditure and openness in China
(when one controls for per capita GDP, urbanisation and population density)



Note: Gu=Guizhou, Qi=Qinghai, An=Anhui, Ne=Neimenggu, He=Hebei, Ji=Jiangxi, Sh=Shandong

2. Openness to the outside and transition towards the market economy, complementary explanations of public expenditure?

The positive relation which we have just looked at between public expenditure and openness to the outside of each province could only be the reflection of the transition in China towards a market economy. Indeed, it is probable that the provinces most open to the outside are those where the process of transition towards a market economy was the quickest.

Certainly, at first sight, it would seem that the relation between transition and public expenditure (contrary to the relation between openness and public expenditure) should be negative. The development of the non-state sector was indeed accompanied by a reduction in the fiscal subsidies to the enterprises, which fell from 25.3% of fiscal revenues in 1985 to 3.4% in 1998. However, other hypotheses can be formulated which suggest a positive link between transition and public expenditure. As the reform of the public sector led to massive redundancies and, it would seem, to an increase in unemployment, despite the development of

the non-state sector, we might expect the governments to attempt to alleviate the negative social consequences of transition, especially by spending in favour of those made redundant from public enterprises[20]. Furthermore, in order to favour the development of the non-state sector or, more generally, to accelerate economic growth and thus justify economic reform, the authorities were led to increase their spending on infrastructures, especially communication infrastructure (roads, railways, telephones, etc.) which is particularly important for economic growth led by exports.

In order to test these different hypotheses and see if the fact of taking them into account modifies the relation between openness and public expenditure, we introduced several new control variables into the model. Firstly, we used the ratio between employment in the non-state sector and the total employed population which, by measuring the relative importance of the non-state sector in the economy, seems to us to be an acceptable "proxy" for the transition of China towards a market economy, and whose sign is here expected to be negative. Several indicators represent the public spending needs linked to transition, whose sign, however, is expected to be positive. Thus, the rate of assisted unemployed, i.e. the ratio of registered unemployed receiving benefit from the employment agencies to the number of registered unemployed, seemed to reasonably represent the worry of each province to favour reinsertion into the productive system of the people made redundant, or more generally for the social concerns of the provinces. The level of revenue inequality in each province (measured by the Gini coefficient en 1992, calculated in Lin, Cai and Li (1999) can be considered as a "proxy" of the need for social spending. This interest shows itself by the creation of agencies whose task is to provide training to unemployed workers and orient them in their job search. Moreover, there are two indicators relative to infrastructure, the number of telephones as a proportion of the population, and the number of kilometres of roads, railways and navigable routes as a proportion of the area of each province. The more an economy is open, the more profitable spending on infrastructure appears. The more the infrastructure is intensive, the more significant are the maintenance costs, and thus the recurrent costs.

The results are shown in the last eight columns of table 1. The rate of non-state employment and the rate of assisted unemployed[21] are significant and have the expected sign, which is also true for the means of communication variable. On the other hand, the variable

[20] This policy can be witnessed in the re-employment programmes initiated in the city of Shanghai; and is seen through the creation of agencies responsible for the retraining and orientation of unemployed workers.

[21] Instead of this variable, we introduced the rate of assisted unemployed compared to the active population, but this variable is insignificant. Doubtless, it represents less well the commitment of the provinces in favour of employment.

for the number of telephones is only significant at the 11% level, and the revenue inequality coefficient is not significantly different from zero. The important point is that the introduction of these new variables does not significantly modify the openness coefficient (whose significance increases, going from 10 to 5%). Thus transition and openness simultaneously explain provincial public expenditure.

As in D. Rodrik's econometric analysis, the estimated elasticity of the rate of public expenditure to openness is a little larger than 0.2. According to the Beta coefficient, a standard deviation change in the rate of openness will lead to a 0.52 standard deviation change in the rate of public expenditure. More correctly, as the median values of openness and the rate of fiscal expenditure are approximately 15.5% and 9.9% respectively, a province with, for example, an openness of 25% (a difference of 61.3% from the median) would have a higher rate of public expenditure than the median of 1.2% (0.2*0.613*0.099), or in other words passing from 9.9% to 11.1%, all other things being equal.

3. Public expenditure: protection against external risk?

Once the existence of a positive relation between openness to the outside and provincial public expenditure has been confirmed, it is necessary to identify the channels of this relation. In this respect, two hypotheses warrant testing. The first is that of Rodrik, according to which the more an economy is open to the exterior, the more unstable it is and the more the state would be encouraged to increase its spending in order to reduce the instability of global revenue. The second refers to the consequences of this instability of global revenue in open economies on the instability of fiscal revenues. The latter is, moreover, reinforced in developing countries, because a large part of the taxes is based on foreign exchanges because this category of tax is easier to manage. Henceforth, if we suppose, moreover, that there exists an asymmetric effect for public expenditure, according to which it is easier to increase spending during a boom period of fiscal revenues than to reduce it in a period of decline, the average rate of public expenditure will be all the more significant as the countries are subject to external shocks which affect their fiscal resources.

In the case of the Chinese provinces, this second channel of transmission between openness and public expenditure is, without doubt, less pertinent as the taxes exercised on foreign trade abandon the revenues of the central government, and their variation has no impact on provincial revenues. However, as the instability of the economy, be it due to

external shocks or a "stop and go[22]" macroeconomic policy, is likely to cause an instability of fiscal revenues and a ratchet effect on public expenditure, it seems to justify the testing of Rodrik's hypothesis relative to the role of public expenditure in reducing external risk to control for this ratchet effect.

Two indicators, or "proxies" for the exposure to external risk were used by Rodrik: the standard deviation of the first logarithmic difference in the terms of trade over the previous twenty years, and an index of the product concentration of exports, both being multiplied by the rate of openness. Neither the terms of trade nor the product concentration of exports are available at the level of the Chinese provinces. Consequently, we used an instability coefficient for export revenues, measured as the standard deviation of the first logarithmic difference of exports in current dollars for the period 1978-1995. This variable has the advantage of taking into account the risk linked to the variability of export prices and volumes, but it can not seize the risk linked to the variability of import prices. This instability coefficient was multiplied by the openness coefficient (both expressed as logarithms)[23].

At the same time, so as to test the ratchet effect, we calculated an instability coefficient for fiscal revenues in each province according to the same principle as for the instability coefficient of export revenues. We verified that the instability coefficient of fiscal revenues is not significantly correlated to the rate of openness which, in concordance with our hypothesis, would suggest that the instability of provincial fiscal revenues be of mainly internal origin.

The results are shown in table 2 (columns 1 to 6). The term of interaction between openness and export revenue instability is significant at 5% for budgetary expenditure and for budgetary and extra-budgetary expenditure, while the openness coefficient becomes zero. We thus find similar results to those of Rodrik. The introduction of the instability coefficient for fiscal revenues, which is positive but insignificant, indicates that this instability does not exercise a ratchet effect on public expenditure without this affecting the preceding results.

The fact that the budgetary expenditure of the provinces could be explained (with the adjusted R^2 of the regression of 70%) by the same factors as the total of budgetary and extra-budgetary expenditure, and the fact these factors are, moreover, different from the traditional determinants of fiscal pressure, testifies in favour of fiscal autonomy of the provinces.

[22] Such as China has effectively practiced over the last twenty years.

[23] We also tried the Rodrik specification without logarithms; the results are barely different, although the determinant coefficient is smaller.

If the provinces can determine the amount of their spending, it is even more obvious that they choose the composition (Bahl, 1999). This autonomy results from a sharing of responsibility between the central government and the provinces with respect to public spending, according to its nature[24], even if there exists a certain overlapping in the domains of higher education health and infrastructure (Ma, 1997). That is why it is pertinent to consider not only the relation between openness to the outside and total expenditure, but also to test this relation by category of expenditure and to analyse if the role of public expenditure in protection against external risk is fulfilled more particularly by certain categories of expenditure[25].

When we break down the budgetary expenditure of the provinces into four categories (productive or infrastructure spending, governmental public service spending, human capital spending and social security and welfare spending), we notice that the term of interaction between openness and external risk if significant for these last two categories only (columns 7 and 8 of table 2). The coefficient is more than twice that of the equation of budgetary public expenditure and is significant at 1%. It does not seem abnormal that this type of expenditure (of a social nature) should be particularly influenced by the objective of social insurance against external risk (cf. Cameron, 1978).

Finally, if we apply the same analysis to public investment expenditure (financed by budgetary, extra-budgetary ressources and hors-budget)[26] (table 2 column 9), we obtain the same type of results: the term of interaction between openness and the instability of export revenues has a strongly significant positive effect, although less. At the same time, the coefficient of openness becomes negative and significant for spending on social security and welfare and for public investment, thus suggesting that openness, once it has been controlled for external risk, tends to reduce state intervention, in accordance with the traditional hypothesis.

[24] Spending on defence, research, central administration, inter-regional or central debt and investment come back to the central government.
[25] In accordance with the analysis of Rodrik, 1998.
[26] We recall (section 1) that it is the case of central and local public expenditure in each province.

Table 2: Public expenditure and alleviation of external risk

	Rate of public expenditure, 9698		Rate of public expenditure, 9698		Rate of public expenditure, 9698		Rate of expenditure on human capital, 9698	Rate of expenditure on social security and welfare, 9698	Rate of public investment, 9698
	B	E	B	E	B	E	B	B	B
C	4.11***	4.01***	2.35	2.95**	3.46**	3.95***	5.11*	0.43	0.20
Openness 9295	0.14	0.08	0.12	0.07	0.23***	0.17**	-0.27	-0.43*	-0.27*
Per capita GDP96	-0.32	-0.19	-0.23	-0.14	-0.46**	-0.33**	-0.11	0.28	0.37
Urbanisation96	0.22	0.11	0.25	0.13	0.50***	0.36***	0.04	-0.18	0.17
Private/total employment96	-0.37***	-0.29***	-0.29**	-0.24**	-0.41***	-0.36***	-1.11***	-0.52**	-0.39***
Rate of assisted unemployed96	0.26**	0.14**	0.18**	0.10**	0.26**	0.17*	0.40	0.24	-0.02
Kilometres of lines of communication as% of area 96	-0.02	-0.02	-0.01	-0.02	0.06	0.05	-0.14	-0.30	-0.06
Instability of export revenues 7895	0.01	0.01	-0.02	-0.03			0.08	0.17	-0.02
Term of interaction between openness and instability	0.67**	0.63**	0.72**	0.66**			0.28***	0.20**	0.14***
Instability of fiscal revenues 8595			0.33	0.20	0.30	0.16			
Adjusted R^2	0.70	0.68	0.73	0.67	0.68	0.60	0.67	0.68	0.56

Note: Column A; budgetary expenditures, column B; budgetary and extra-budgetary expenditures. All variables are expressed as logarithms.
number of observations: 29, t corrections of the heteroskedasticity by the White procedure.
*** = significant at the 1% threshold; ** = significant at the 5% threshold; * = significant at the 10% threshold .

All the explicative variables of the model were shifted in time compared to the explained variable so as to reduce the risk of endogeneity of the variables. Nonetheless, it seems reasonable to us to test if the causality does not run from the size of the government (measured by public expenditure) to the openness of the economy and thus to the exposure to external risk (Rodrik 1998). This test is, here, all the more necessary as openness and public expenditure for the whole of China have evolved over time in the opposite direction. Two methods were used successively. First, the observed openness variable was replaced by a variable estimated on the basis of structural determinants of openness, in this case population (indicator of province size), a dummy variable representing geographical position (1 for coastal regions, 0 for the others) and two final variables representing the mining and coal endowments respectively of the provinces. In general, we make the hypothesis that the more mining resources a developing country has available, the more open to the outside it is (Guillaumont, 1994). In fact, in China, mining and coal resources are rarely exported in gross, rather they are used as intermediary products in national industry, either in their place of origin or in other provinces. We thus expect that these last two variables have an inverse and negative sign (cf column 1 table 3). Secondly, we used the method of instrumental variables with the structural determinants as exogenous variables, as well as the rate of direct foreign investment. Table 3 (columns 2 and 3) gives the results of these two new regressions of the rate of budgetary expenditure which are only slightly modified, notably with respect to the variable of interaction, representing the exposure to external risk for each province.

In order to see if the provinces most exposed to external risk are those which show the greatest variability in their revenue, we regressed the instability of revenue per province on their exposure to external risk. We successively calculated an instability coefficient of the real GDP and real GDP minus public expenditure, i.e. private GDP, according to the same principles as for the instability coefficient of exports. The external risk coefficient is positive and significant, as much for the instability of global product as for that of private product (cf. table 4).

Throughout this analysis, we cannot reject the hypothesis that the governments of the Chinese provinces, with respect to public expenditure, have a behaviour similar to that of developing countries significantly affected by external shocks, and that in order to alleviate external risk, they take control of a more significant share of the resources of the economy.

Table 3: Test of exogeneity of the variable of openness

	Openness9295	Rate of budgetary expenditure, 9698 MCO	Rate of budgetary expenditure, 9698 MVI
C	2.95***	4.11***	4.73***
Coastal provinces	0.96***		
Rate of mining production 92	-0.51**		
Rate of coal production 92	-0.17*		
Population 1992	-0.06		
Estimated openness 9295		0.06	
Openness 9295			-0.15
Per capita GDP96		-0.37***	-0.42*
Urbanisation96		0.19	0.12
Rate of total/non-state employment 96		-0.34***	-0.25*
Rate of assisted unemployment 96		0.28***	0.23*
Revenue instability of exports 7895		0.07	0.07
Term of interaction between openness and instability		0.10***	0.17*
R^2	0.58	0.71	0.70

Note: The instrumental variables are endowments in mining and coal resources, population, the dummy variable representing the coastal regions, the rate of direct foreign investment, urbanisation, nominal per capita GDP, rate of non-state employment and rate of assisted unemployed. T corrections of the heteroskedasticity by the White procedure.
*** = significant at the 1% threshold; ** = significant at the 5% threshold; * = significant at the 10% threshold.

Table 4: Relation between product instability and the exposure to external risk

	Instability of global product	Instability of private product
Constant	3.76***	3.89***
Term of interaction between openness and instability	0.24**	0.26**
R^2 adjusted	0.11	0.12

Conclusion

The transition of China towards a market economy was accompanied by a vast fiscal decentralisation movement. The object of this article was to analyse whether or not, with respect to public expenditure, the governments of the Chinese provinces acquired a similar behaviour to the governments of national states, and notably whether, like them, they increased their expenditure in order to alleviate the risk of revenue instability linked to external shocks.

Alongside the traditional determinants of public expenditure (level of development, rate of urbanisation, population density), which proved to be significant, we were led to introduce several variables representing the need for government intervention linked to the transition towards a market economy and openness to the exterior. The introduction of these variables confirmed the robust character of the positive correlation between the openness of each province and the rate of public expenditure (whether it is only budgetary expenditure or budgetary and extra-budgetary expenditure).

Finally, we showed that this positive correlation could be explained, in accordance with Rodrik's hypothesis for all of the developing countries, by the budgetary expenditure of the Chinese provinces having been given a role of social insurance against external risk, even when we control for a possible ratchet effect of public expenditure.

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