The Accession of China to WTO: The Consequences for the Regional Gap

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Abstract

China's accession to WTO is bringing important changes, exposing the local market to foreign competition. At the same time, Chinese growth is experiencing a disparity between the coast and the interior. It is expected that WTO entry will increase this problem. In our paper, we address this issue using a two-region, three-sector model, based on statistical data and the most reasonable assumptions, and on our single region, single product model (The consequences of China's entry to WTO, JL BRILLET, LIU Xiaoyue, 2002). The behavioral equations have been calibrated based on this model. The regional dimension separates the 11 coastal regions from the 12 others. The product dimension separates the primary, secondary and tertiary sectors.

The model computes the trade flows between the two regions and the rest of the world. Preset shares are modified by availability of productive capacities, relative prices, and availability of transport. After a detailed description of the framework, we introduce separate changes in the assumptions, for each measure in the WTO process. We observe and interpret their consequences, concentrating on regional disparities. In this first version, changes will concern only the actual decisions: on tariffs, quotas and subsidies. The conclusions are that WTO does increase the gap, but Government policy should be able to moderate its effects.

A lack of detail

In a previous paper, we have already addressed the issue of the accession of China to WTO. But using a single product, single region model made some of the above conclusions questionable or at least incomplete. We shall try to improve our diagnosis using a more detailed model, which we shall present now.

The regional model

An idea widely accepted, in particular by the Chinese economists themselves, is that one if not the main problem for China's present development is the difference in speed between the costal region and the interior, leading to a widening gap which might have severe social consequences. To assess this problem, we have developed a regional version of the model presented above.

The options

Compared to the aggregated version, the new model presents the following characteristics.

- Two regions : the coast and the interior.
- Three products : primary, secondary and tertiary.
- Identified trade flows.
- A decomposition of trade according to competitiveness elements.
- Calibrated behavioural equations, using an error correction framework

Let us address these points in turn

Two regions

For our problem, the most pertinent regional decomposition for China is to separate the coastal region from the interior.

- The coastal region will be defined simply as the 11 regions having a coast. This means Liaoning, Beijing, Hebei, Tianjin, Shandong, Jangsu, Shanghai, Zhejiang, Fujian, Guangdong, Hainan (see map).

- The interior will include the 19 provinces : Heilongjiang, Jilin, Inner Mongolia, Xinjiang, Tibet, Yunnan, Guangxi, Gansu, Qinghai, Ningxia, Shanxi, Henan, Anhui, Shaanx, Hubei, Sichuan, Hunan, Guizhou, Jiangxi.

Hong Kong will be excluded (as well as Taiwan).

This option has the merit of simplicity. It also allows comparison with other studies, which generally adopt the same separation.

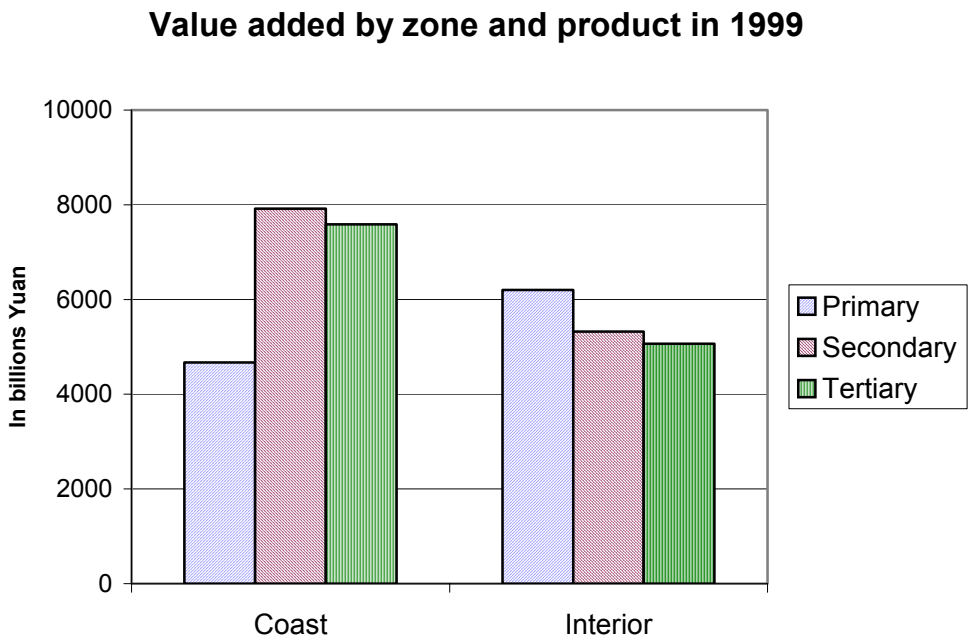
However, discussion with Chinese economists could lead to the decomposition of the interior into two regions : Centre and West. The latter would include probably Xinjiang, Tibet, Qinghai, Gansu and Inner Mongolia. The reason would be that these regions are less developed, and have less infrastructures than the Centre, in which cities like Chengdu or Chonqing are quite similar in economic terms to coastal ones.

We have not used this idea for the moment, the main reason being that the weight of this new region in the Chinese economy is rather limited at present, and probably in the foreseeable future.

However, it is also true that the development of these regions is an important issue, and we have not eliminated this option for a future version.

Three products

To fully exploit our separation, we need to associate each region with its characteristics. In our case, perhaps the most important one is its product decomposition, as the role of agriculture is much more important in the interior, while secondary products (industry) and services dominate on the coast, as shown in the following diagram.



This separation has additional advantages, and few disadvantages. On the positive side, it will allow a better formalizing of the production function, which can now use a different framework according to the product.

- For the primary product, we can use specific features associated with agriculture, such as the role of land, of chemicals, of irrigation, and machinery, as well as the definition of demand for labour.

- For the secondary product, we can assess the role of capital, and use a more sophisticated function, such as Cobb Douglas or CES, taking into account capital-labour substitution and linking it to the relative costs. We can also define clearly the level of productive capacity.

- For the tertiary product, we can free the production level from capital

The main negative points concern the heterogeneity remaining in this limited decomposition. In particular, the primary product is not limited to agriculture. The problem is not too important for fishing and forestry, which can be supposed to follow an economic framework similar to agriculture, but it is more important for mining, which is a more industrial type process, and is managed by State enterprises. However, mining in terms of value added represents only about 20% of the primary sector (in 2001).

Also, for some series, the decomposition is not available in the YearBook. Of course, the problem is much smaller than for the regional decomposition, for which each YearBook gives only the

values for the most recent period. To produce a time series, one has to collect data from successive Yearbooks, a tedious task which is not always efficient as the location, definition and availability of some series can change from one YearBook to another.

Identified trade flows

In our model, we shall describe the trade flows between three actors : the two regions and the rest of the world. These trade flows will not only be decomposed by product, but also by use. This means that for a given product we shall consider its final demand, and its intermediary consumption by other products and itself.

Actually, to avoid having to manage a too complex model, we shall limit the scope of intermediate consumptions. We shall only consider for the time being intra consumption of the secondary product, and the consumption of the primary and secondary products by each other.

Of course, this framework introduces a data problem. Although we do have access to a detailed input-output table (for the year 1997) which we can aggregate according to our needs, the regional detail is completely absent. We must therefore use a priori assumptions, based on other observations, and somewhat controlled ex post by checking the equilibrium between supply and demand for a given product and region.

A formalization of trade

Having decided to identify trade flows, we must now decide on their economic determinants. We shall start from a framework developed for a multi country model of the European Union (Ref). This framework follows these steps:

We start from the demand of one region in one good, for a particular purpose, for instance the demand from the coastal region for primary goods for use by the secondary good.

We apply “normal” coefficients based on observation and assumptions, to decompose this demand between the region itself, the other region and the rest of the world. For instance 20% of the above demand will be addressed to the interior.

We correct these weights by three competitiveness indicators :

- Price competitiveness, comparing the “export” price of the supplying region to the weighted average of its competitors’ export price.

- Capacity competitiveness, comparing the available capacity of the region to the available capacity of its competitors (for the Rest of the World, capacity is fixed as they have no problem on this regard).

- Transportation availability, representing the easiness to transfer goods from one region to another, or within it. This indicator has the base value 1, and can be increased or decreased according to the creation of new facilities or the improving of existing ones. We must stress that this does not correspond to a change in transportation costs. For train freight for instance, it would represent a decrease in the time it takes to transfer goods, not the cost of transfer. This transportation index is then compared to the index of competitors. Of course, changes in the transportation cost can (and have to) be introduced in another way.

Calibrated equations

Concerning behaviours, we shall follow in general the framework of the aggregated model, which described :

- Production factors : investment and labour
- Unemployment.
- Prices : deflators for value added, exports and imports, and wages.
- Household consumption.
- External trade : imports and exports at constant prices.

We need now to produce these equations, at a doubly detailed level : regional and by product.

However, the framework we are using obviously eliminates the need for estimating equations for trade at constant prices, as global imports are now identified as the trade flow coming to the region (and not produced within it) and global exports will be obtained by aggregating individual export trade flows. And import prices will be computed as a weighted average of export prices, correcting for the exchange rate if needed. Only export prices could be estimated as a weighted average of the local costs and the price on the targeted market, if data was available.

All the remaining equations will be defined at the regional (and product) level. However, even if some regional series can be constructed, for none of these equations do we have access to all the data needed for estimation, which means both the explained variable and its determinants. We have in fact two options:

- Estimating the equation at a higher level (either the product level or even the global one) and apply the results to the lower level, correcting for the average. Or instance, we shall estimate the global wage equation by sector, then the average wage per region, and correct the constant term of the global equation to get a mean regional residual of zero. In almost all cases, as the equation is written in logarithms, this correction will be multiplicative in the explained variable and additive in the formulation.

- Chosing the value of the coefficients taking into account several elements, such as the values found for the aggregated model, for other models of the same type, or economic theory.

We have chosen the second option, which gives us more freedom in producing specifications we can control, and conform to the theory behind the model.

In particular, we shall be able to use systematically error correction formulations, with dynamics showing a reasonable adaptation speed, both in the short and the long term, and converging to the actual theoretical target.

Detailing the framework

We shall now present the equations in detail. To simplify the language, we shall call the costal zone, the interior and the rest of the world “regions” and the trade flows between regions “exports” or “imports” accordingly.

The trade flow system

Let us start with the trade flows. First, we shall not consider trade of the tertiary product, for now. The following system is limited to primary and secondary goods.

We shall start by establishing a coherent system for trade prices. For this we shall start from the export price (calibrated for lack of data).

We shall suppose that the export price is equal to the production price, except for the exports to and from the rest of the world.

Exporters from the rest of the world will take into account the local Chinese regional price for 30% and their cost (corrected by the exchange rate) for 70%.
Exporters to the rest of the world will take into account the foreign price (corrected by the exchange rate) for 30% and their cost for 70%.

Of course, these values are parameters which can be changed at will.

For product i, the export price of region j to region k will be computed in the currency of the exporting region as :

$$Log(\, pex_{i,j,k}\,) = aLog(\, pp_{i,j}\,) + (1-a)Log(\, pp_{i,k} \cdot exr_{j}\,) + e \cdot temps + f$$

Where a = 1 if neither region i nor region j represents the rest of the world, and 0.7 otherwise.
Of course the exchange rate is equal to 1 for trade flows inside China.

Then we aggregate the export prices to one region to get the weighted import price

$$pim_{i,j} = \sum_{k} m_{i,j,k} Log(\, pex_{i,j,k} er_{k} \,/\, er_{j}\,) / \sum_{k} m_{i,j,k}$$

As to utilization rates, we use the same method (without currency corrections).

$$utx_{i,j} = \sum_{k} m_{i,j,k} Log(ut_{j,k}) \Big/ \sum_{k} m_{i,j,k}$$

Finally the quality of transportation between regions is represented by the variable $tra_{i,j,k}$, where I stands for the product, j for the importing region, and k for the exporting one (we shall always use this ordering).

Typically, transportation in one direction will have the same quality as for the reverse one, but not necessarily.

The average will be computed as :

$$Log(tram_{i,j}) = \sum_{k} m_{i,j,k} Log(tra_{i,j,k}) \Big/ \sum_{k} m_{i,j,k}$$

Finally, we shall use the three competitiveness criteria to compute the deviation of the import share b for product i of each exporting region k in the imports of j, using :

$$a_{i,j,k} = b_{i,j,k} \cdot [1 + \alpha \cdot Log(\, pex_{i,j,k} \,/\, pim_{i,j}\,) + \beta \cdot Log(ut_{i,j,k} \,/\, utm_{i,j}\,)$$

$$+ \gamma \cdot Log(tra_{i,j,k} \,/\, tram_{i,j}\,)]$$

Actually, i does not correspond to a product, but to an use : either final demand of one product, or the intermediate consumption of a product by another.

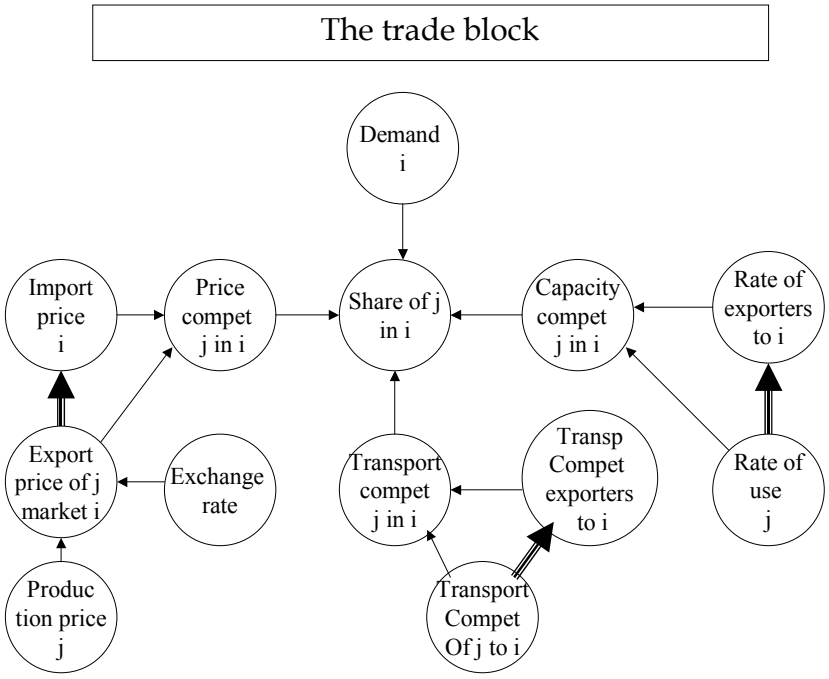
The above equation means that suppliers to one region (including its own producers) will increase a « natural » share with competitiveness, available capacity, and transportation quality, to their

competitors. More precisely, the B matrixes represent the sharing of bilateral trade associated with identical rates of use, competitiveness and transportation quality for all regions (not necessarily the most natural assumption, nor the present situation). Scalars α, β and γ are fixed, and will be set as a base value to 1.

One will observe that this technique guarantees the identity of the sum of individual exports with its global value, without any correction.

Of course, the α, β and γ coefficients can be different from one market to another, but not within one market.

The system can be summarized with this graph :



We can now compute the value added of one region for a given product :

$$va_{i,j} = \sum_k fdm_{i,k,j} + \sum_k ic_{i,k,j} - \sum_k ic_{i,j,k}$$

In addition to the above, we have introduced some accounting equations, for imports, exports, final demand and value added:

- by region
- by product
- as a total

both at constant and current prices, as well as the associated deflators.

We shall not give their list here.

The error correction behaviors

The remaining equations we have to calibrate correspond to :

- Production factors : investment and labour
- Unemployment.
- Prices : deflators for value added and wages.
- Household consumption.

Each of them has to be identified by product and region, except for unemployment (by region only).

We shall describe each of them briefly, as they are rather straightforward.

Production factors

The definition of productive capacity allows taking into account substitution between factors, as the associated coefficients can be changed. However, the present exercise will use zero substitution, which means in practice applying a complementary function[1]. This means that the optimal combination between capital and labour is unique, and firms have no reason to take into account relative changes in the cost of factors. It depends actually on the level of capital, as labour is supposed to be always sufficient to achieve the requested production level.

Targets are set on investment and employment to achieve productivity goals, and actual values follow with a strong inertia.

This inertia is higher for capital, as wrong investment decisions are more difficult to reverse. Investment is also favoured by higher profits, and by lower interest rates

$$\frac{IFC_t}{CAP_{t-1}} = a * \frac{IFC_{t-1}}{CAP_{t-2}} + b * tx(GDP_{t+1}) + d * UT_t + e * RPRO_t + f * irlr + c$$

.For employment, we first compute target labor productivity :

$$\log(\frac{vac}{l}) = c + a * t + \varepsilon$$

then target employment:

$$ld = \frac{vac}{plt}$$

Then actual employment, using an error correction framework:

[1] In other words, the productive capacity is defined by :

CAP = min (πk . K, πl L).

Actually the productivity of labour is more flexible, and capital is the only limiting factor in the short term.

Where K and L are the levels of capital and labour, and πk and πl the associated productivities.

$$\Delta \log(l) = \alpha * \Delta \log(ld) + \beta * \log\left(\frac{ld_{-1}}{l_{-1}}\right) + c$$

The variations of employment do not translate fully into unemployment. Job creation will attract to the labor market previously inactive persons, increasing the work force.

But the level of the labor market situation will also influence the evolution of the work force. This calls for an error correction framework, leading to a target rate of unemployment

.

$$\Delta u = a * \Delta l + c + b * \Delta pop - d * (u_{-1} - e * l_{-1} - f * pop_{-1})$$

Household consumption

Household consumption is first defined at a regional revel. It depends on
revenue (with some inertia),
inflation, which increases the effort needed to maintain the purchasing power of previous savings,
the change in unemployment, which influences the perceived probability of a drop in future revenue.

In the long run, the elasticity of consumption to revenue is unitary. The measure of household revenue separates wages (employment level times the wage rate) and non-wage revenue.

$$\Delta \log(chc) = a * \Delta \log(hrdc) + b * \Delta \log(cpi) + \Delta * irsr + f * \Delta ur + g * \log\left(\frac{hrdc_{-1}}{chc_{-1}}\right) + c$$

Prices and wages

To define their price index for goods sold on the local market, local firms apply a margins rate to their wage costs, which they achieve through an error-correcting formulation. This margins rate target is not fixed, but determined simultaneously with a target on capacity utilization. If the rate of use of capacity is not on target, the price will be used to close the gap in the short run.

$$\Delta \log(pva) = a * \Delta \log(cu) + b * ut + d * \log\left(\frac{cu_{-1}}{pva_{-1}}\right) + c$$

The wage rate partially follows inflation in the short term. In the long run, the share of wages in the value of production will converge to a given target, depending on the unemployment rate, which represents the relative bargaining power of firms and workers. This means that eventual gains in labour productivity are fully transferred to wages.

$$\Delta log(wr) = a * \Delta log(cpi) + b * ur + f * log\left(wr_{-1} * \frac{1 + r\_cse_{-1}}{(cpi_{-1} * pva_{-1})\text{^}0.5 * prlt_{-1}}\right)$$

The consequences of WTO accession

We shall now use the above model to study the consequences of WTO accession for China, focusing on the regional aspects.

We shall start with the most immediate and undisputable consequences, the reduction of trade limitations coming from tariffs and quotas.

This will lead us naturally to consider four separate shocks on our set of assumptions :

- A reduction of tariffs applied in China to imports from the rest of the world.
- A reduction of tariffs applied in the rest of the world to Chinese imports.
- A reduction of quotas applied in China to imports from the rest of the world.
- A reduction of quotas applied in the rest of the world to Chinese imports.

The regional and sectoral features

Our previous paper ("China's accession to WTO : interpreting the issues using a Chinese macroeconomic Model") addressed already the present problem, in a single region, single product context. The model used in the present study retains the same global economic framework from a theoretical point of view, and should give similar results if we consider China as a whole. The originality and interest will come from the sectoral and regional decomposition.

Before any practical application, we can expect

The interior is less open to world trade, as most of the exported products come from the coastal region, in particular because of lower transportation costs. This is also true for imports, to which the coastal region is more permeable.

The share of agricultural products is higher in the interior. These products are less sensitive to external trade than manufactured goods. However, services play a more important role in the coastal region, and they are almost only produced locally (our model does not consider trade in services).

A reduction of foreign tariffs (Case A)

We shall first consider a decrease in these tariffs, by one point of the Chinese export price. Our model considers two export prices: we first define the price asked by the Chinese exporters, then we apply the tariffs rate to get the price paid in foreign countries by the buyers of Chinese goods. We shall only apply the change to the second variable. The untaxed export price will not change ex ante, as well as the trade balance, but the competitiveness of Chinese exports will increase by one point.

Actually this option can be questioned. One can suppose that Chinese exporters, faced ex ante with a gain of 1% in competitiveness, will spend it in part to improve their margins through an increase in their own export price.

The main consequences of this shock are quite logical. From the start, exports present an increase close to 1%, followed by GDP, final demand and imports. The increase in final demand comes mostly from the equipment needed to allow the production of the exported goods, and the consumption of the workers hired for the same purpose. A share of this demand is of course imported, to which we have to add the intermediate goods entering the production process.

In the short run, the role of imports is increased by a supply bottleneck due to the inertia on local capacities. They adapt gradually, but inflation appears, reducing the competitiveness of Chinese exporters, and of local producers on the local market. However, this loss is rather limited (around 0.1%).

As could be expected, the export-import ratios improve (A_2), but by less than 1%, due to the ex post reduction of the export improvement and the increase in imports. The gain at current prices is somewhat improved by the evolution of the terms of trade, as export prices are more sensitive to local inflation. As to the budget balance, it profits moderately from the improved growth.

Let us now consider the **regional dimension**. Concerning exports, we lack statistics separating them into region of origin (the available elements, using the region in which the exports actually happen, favour abnormally Guangdong, as could be expected). We have supposed that 70% of them come from the Coastal region.

Graph A_3 shows the evolution for both regions and both exported goods of the exports-to-GDP ratio. It is clear that the coastal region profits the most, in a ratio close to two.

For imports, we shall use graphs A_4 and A_5, which decompose for each good the absolute sharing in the trade flows associated with local demand (excluding exports). Both graphs show that the share of foreign exporters increases, especially in the beginning when capacities are still to low. However, at least in the first periods, the associated loss is quite lower for the interior producers, both on their market and on their "exports" to the coast, where it is almost non-existent. This is clearly due to the supply effect. In the long run, the permanently higher loss in competitiveness sustains the loss in the coastal share.

The above remarks suppose that the advantage for the coastal region is permanent. Graph A_6 shows that this is the case, for all goods.

Graph A_7 and A_8 summarize the consequences on value added and employment. They both evidence the higher gains of the coastal region, in relative terms.

However the diagnosis is not so clear if we consider absolute values, as shown by diagram A_9, which presents the absolute variations of employment and value added after five periods.

We see indeed that the much higher increase in value added obtained by the coastal zone comes from all goods, primary good included. But this is almost compensated by the lower productivity of the interior, especially if we consider agriculture. Of course, the associated workers being less productive earn lower wages, and create less household revenue.

Conclusion : a decrease in tariffs applied to Chinese products improves GDP, the trade balance and the State budget. The gain in production is much higher for the costal region, but employment improvement is similar..

A reduction of Chinese tariffs (Case B).

We have already considered a decrease in tariffs applied to Chinese products, with consequences clearly beneficial for China, over the whole period. But this measure is a part of a global agreement, in which China should also decrease the tariffs it applies to foreign products.

We shall now reduce this tariffs rate by one point, in one step. This means that ex ante the cost of imports will decrease by a little less than one percent. Again, we suppose that exporters to China do not change their own prices, using the situation to improve their margins.

For this shock, the mechanisms are more complex, as shown in graphs B 1 (real elements) and B_2 (prices).

We still have a competitiveness effect, now favouring imports, with the same intensity. Imports increase immediately.

But we also have a capacity effect, which limits the ex ante loss from the start, by about half: in particular, the increased attraction of imported goods does not mean that demand for domestic goods of the same type will decrease by the same amount. If the global demand for that good increases, it will substitute in part for previously imported goods of a different type.

And now the decrease in tariffs will affect local inflation directly, through the share of imported products in demand. For firms, equipment goods will become cheaper, increasing ex ante the profitability of capital. For households, this will mean a higher purchasing power, and a lower effort needed to sustain the purchasing power of savings. In the medium term, the indexation of wages on reduced prices (CPI and value added deflator) will also profit to firms, which will reduce their own prices and improve their competitiveness, both on the local and foreign markets. As Graph B_2 shows, this effect is rather slow, but in the very long run the gain in competitiveness of exports (the reduction in the export price) meets that of imports (the import price including tariffs compared to the local production price) .

As to the trade balance itself, we have of course to consider pre-tax imports. Using this notion, the import price decrease will be very limited, and the higher sensitivity of the export price will make China lose on the terms of trade. Now the evolution of the trade balance is clearly negative, at any horizon.

Concerning the state budget, the ex ante cost of around 0.2 GDP remains almost unchanged, as the positive effects of disinflation are balanced by the negative ones of growth reduction.

The regional evolution is also rather complex. We have to consider that :

- The share of imports in demand is higher for the coastal region, leading to higher gains for foreign exporters (and higher losses for local producers).

- But the lower price of these imports will increase demand and value added, and improve competitiveness through lower costs, both on the foreign and local markets. This will concern both intermediate consumption but also wages, which are indexed partially on local CPI and the specific value added deflator.

- The lower price of equipment goods in the coastal region (even considering the trade between regions) will favour investment and generate capacities.

These elements are illustrated for both traded products by Graphs 4 and 5. We see that :

- The import share grows more in the coastal region.
- Which creates a higher loss in its own share.
- But the evolution of trade between the two regions favours the coast.

- The changes in the shares decrease with time, along with changes in competitiveness and disequilibria on the capacities.

On the whole, this local competitiveness effect, combined with the increase in exports, produces a stronger return to the base solution for the coastal region, as shown in Graph 6.

Conclusion : a decrease in tariffs has positive secondary effects on the local economy, mostly through local deflation, which partially compensate the ex ante increase in imports. Even though ex ante the coastal region bears a higher loss through imports, higher deflation and competitiveness gains on local and foreign markets gradually reverse the diagnosis.

A reduction of quotas in the rest of the world (Case C)

First, let us observe that in our case, the increase in world addressed to China leaves unchanged such external assumptions as world inflation and world available capacities. We are not considering an increase in global world demand, which would modify the whole world economic equilibrium, but a higher appeal for Chinese products, all things being equal. By entering WTO, China will increase the market for its products, independently from competitiveness or supply.

This will actually shorten our comments: in our model, a decrease in quotas applied to Chinese products and a decrease in tariffs (Case A above) have extremely similar consequences. Ex ante, both elements affect only the exports equation, in which the export price including tariffs enters a competitiveness element, and world demand plays directly, both influences using constant elasticities. In the present case, we applied the same 1-point changes to all occurrences of both decisions, and both elasticities are unitary (while this is straightforward for the demand element, other values could be selected for competitiveness). It is logical that the results are completely identical.

Of course, this is a special case. In addition to non-unitary elasticities, taking into account the true decisions, which differ between tariffs and quotas, and between products, would lead of course to different results.

Conclusion: The assumptions lead to results are identical to the shock on foreign tariffs. Using other assumptions, the levels would change, but the logic would remain the same.

A reduction of quotas in China (Case D).

One could expect to obtain results similar to the previous shock, but with opposite signs. If this is true ex ante, the stronger ex post consequences will lead to quite different results.

As in case B, this is due to the fact that the measure affects directly the local market. But now we lack the decrease in local costs coming from the reduced price of imported goods. Here we have only the supply effect : for sectors working at full capacity, the increase in imports allows an increase in demand, rather than a decrease in local production. More precisely, there are two justifications for the remaining supply effect.

First, it is possible that among new imports, demand for some goods could not be satisfied fully, whether by local producers or by imports. Global demand for these goods will increase, substituting for other products, part of which were previously imported. For instance, if the imported cars quota is increased, local car factories can still work full time, if market conditions are met. Chinese consumers could switch their purchases to cars from TV sets, which are often imported. Using figures, if the global share of imports in demand is 30% for all goods, an increase of 1000 of imports for one good for which demand is much higher than supply could translate completely into demand for that good, reducing demand for other goods by 1000. Global imports would only increase by 1000 - 0.3*1000 = 700.

Second, one can assess that importing some goods which were previously produced locally allows firms to propose other goods, more or less similar, and for which potential demand was not satisfied. This implies that a certain degree of substitution is possible within the local production process.

Of course, the change in imports is further reduced by disinflation and the subsequent gains in competitiveness, but this time through the optimising behaviour of the local firms, which try to regain market shares by limiting price increases. This effect will grow with time, as the unemployment reduces the wage demands of workers. For the same reason, gains on exports keep growing.

In the short term, exports also increase through this competitiveness effect, but the combined loss on real trade brings GDP and local demand down, particularly investment, as the need for additional capacities decreases. This further decreases imports, but we must remember that imports depend also on exports, which grow in this case.

Compared to case B, secondary effects are less favourable at the first period, and keep roughly at the same level afterwards. Indeed we observe a slightly growing deflation, coming from the loss in production and the increase in unemployment. But this is compensated by the weakening of the supply effect, as capacities adapt to a lower demand, in the absence of incentives to invest (profitability). Both these elements combine into a roughly constant moderation of the imports increase and the loss in local GDP.

On the whole, the loss on real trade is limited to about half the ex ante value, a little more for trade at current prices with the evolution of the terms of trade.

As to the regional issue, the elimination of the deflationary effect, which favoured the coastal zone, makes the evolutions much closer without reverting the diagnosis. Its openness to foreign trade makes the ex ante effect much higher (Graphs 4 and 5), and if the gain on exports is also higher (Graph 3), it remains low in comparison. Graphs 6, 7 and 8 show that the difference becomes quite small.

As to the State budget, the limit on the ex-post effects make the loss quite small..

Conclusion: as expected, all local elements are negatively affected, apart from prices, which are reduced following the local decrease of activity. Even though the coastal region is more exposed, secondary effects make it suffer less, but by a small margin.

General conclusion

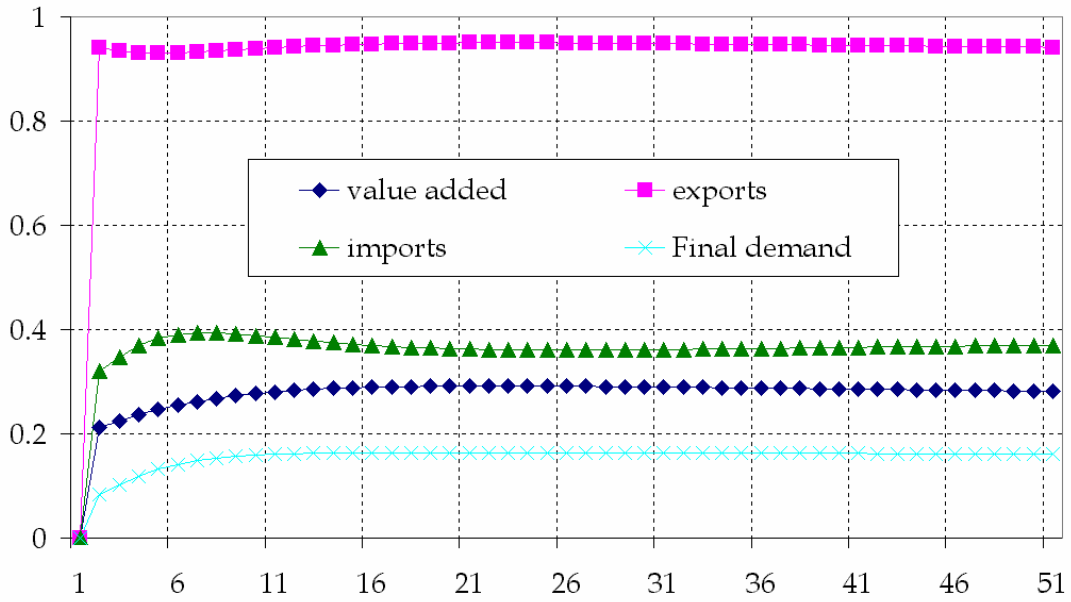
These conclusions on the first elementary decisions come both from the above comments, and a last shock combining all four decisions (Case T).

According to our model, on the whole, the direct effects of trade liberalization (through tariffs and quotas) have a slightly positive effect on Chinese growth, almost totally concentrated in the coastal region, although the interior improves also. Each of the four decisions shows a better (or less bad) result for the former, either immediately (as for foreign tariffs), or through secondary effects which revert the initial order (as for Chinese tariffs).

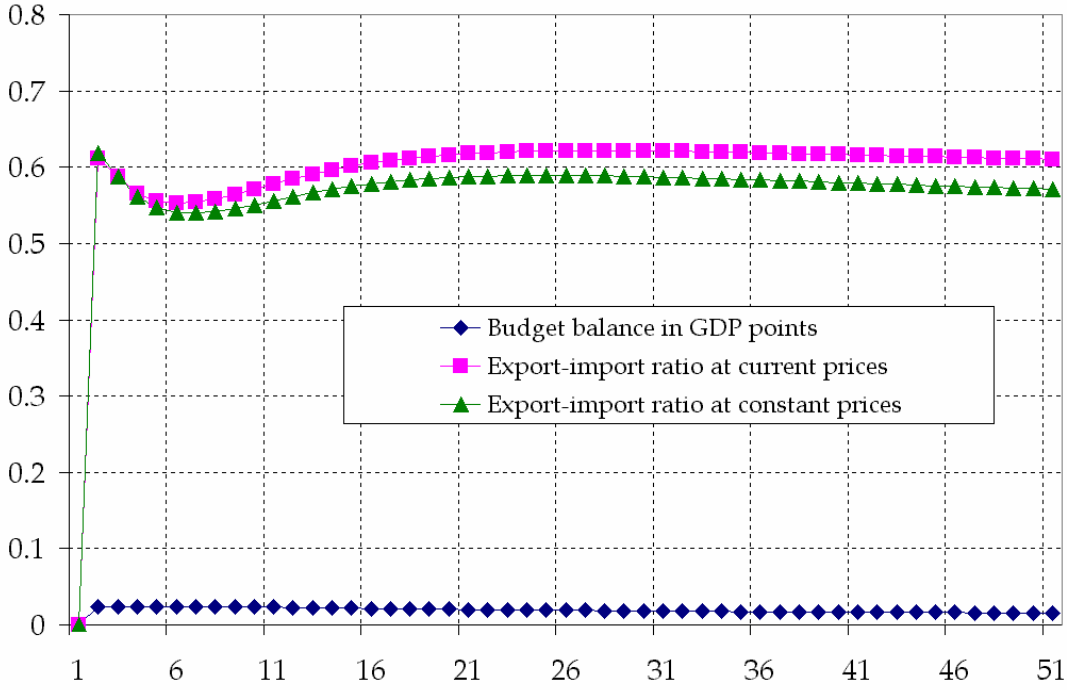
In that light, WTO accession should widen the gap between the two regions, and this should be increased by less automatic changes such as additional FDI, which should concentrate on the coast, or technology transfers. The only way to reverse the process lies probably in pure policy decisions favouring the interior, such as an autoritary increase in local investment, specific incitations such as tax rebates, or the development of transportation within or between regions (even if this last decision is double edged).

All these elements can be treated by our model, and we shall develop them shortly.

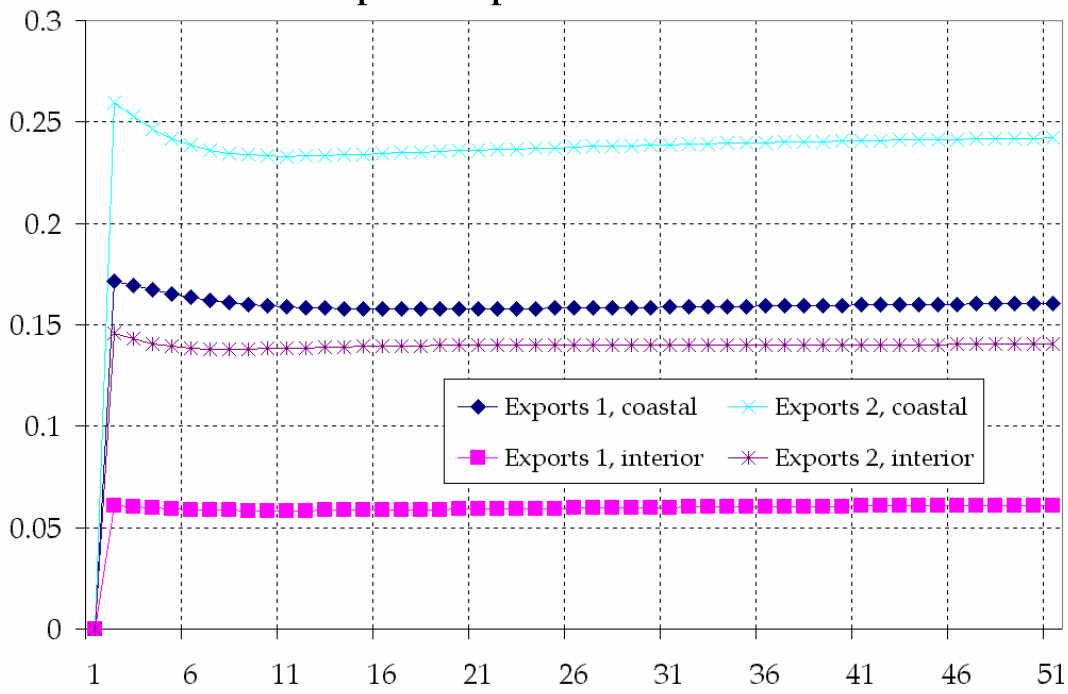
Shock A : Decrease in foreign tariffs
Graph 1 : Global variation of supply and demand



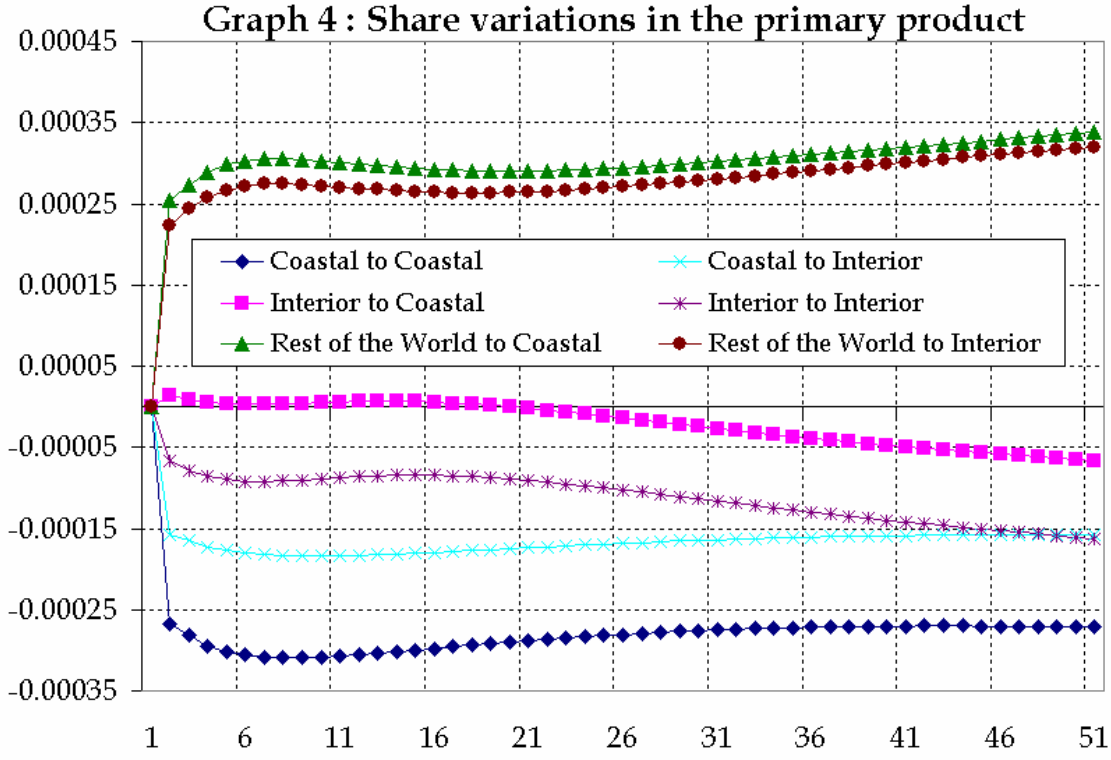
Shock A : Decrease in foreign tariffs
Graph 2 : Trade and State balances



Shock A : Decrease in foreign tariffs
Graph 3 : Export to value added ratio

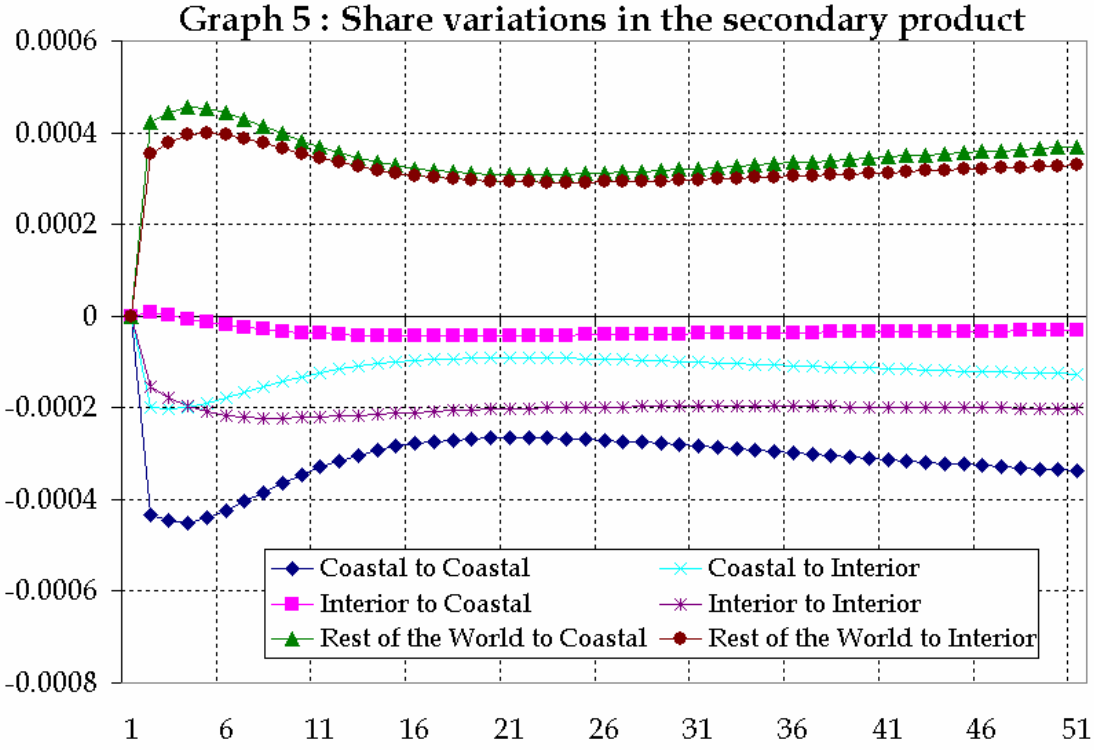


Shock A : Decrease in foreign tariffs
Graph 4 : Share variations in the primary product



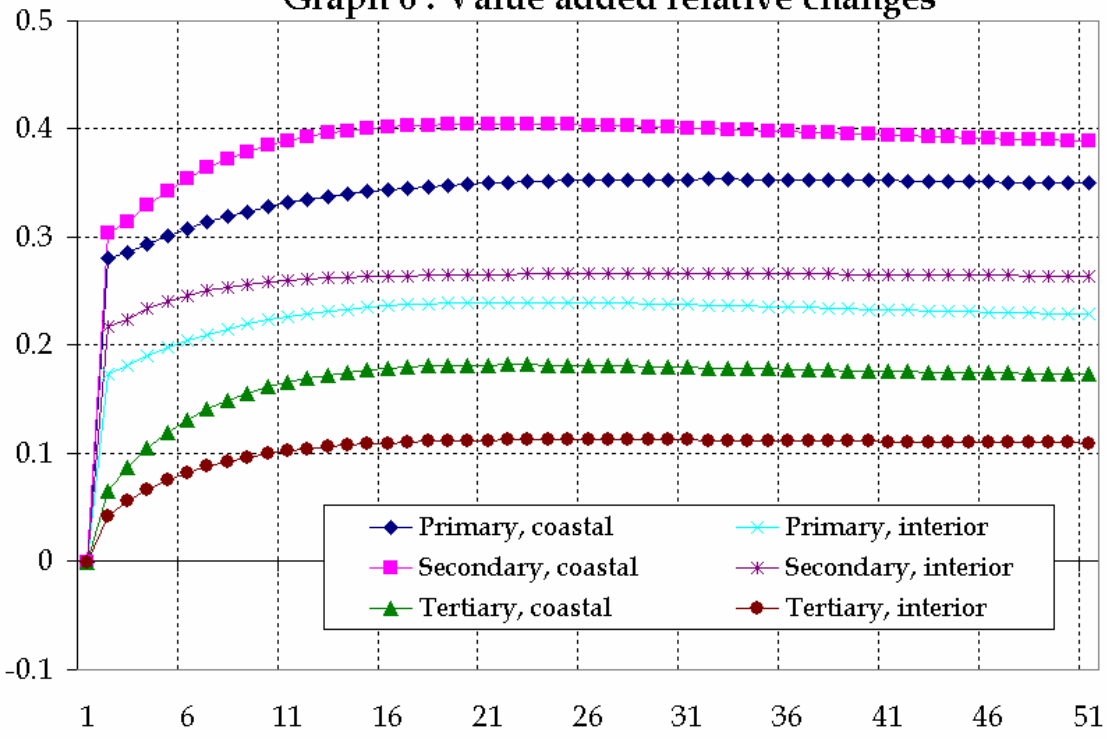
Shock A : Decrease in foreign tariffs

Graph 5 : Share variations in the secondary product

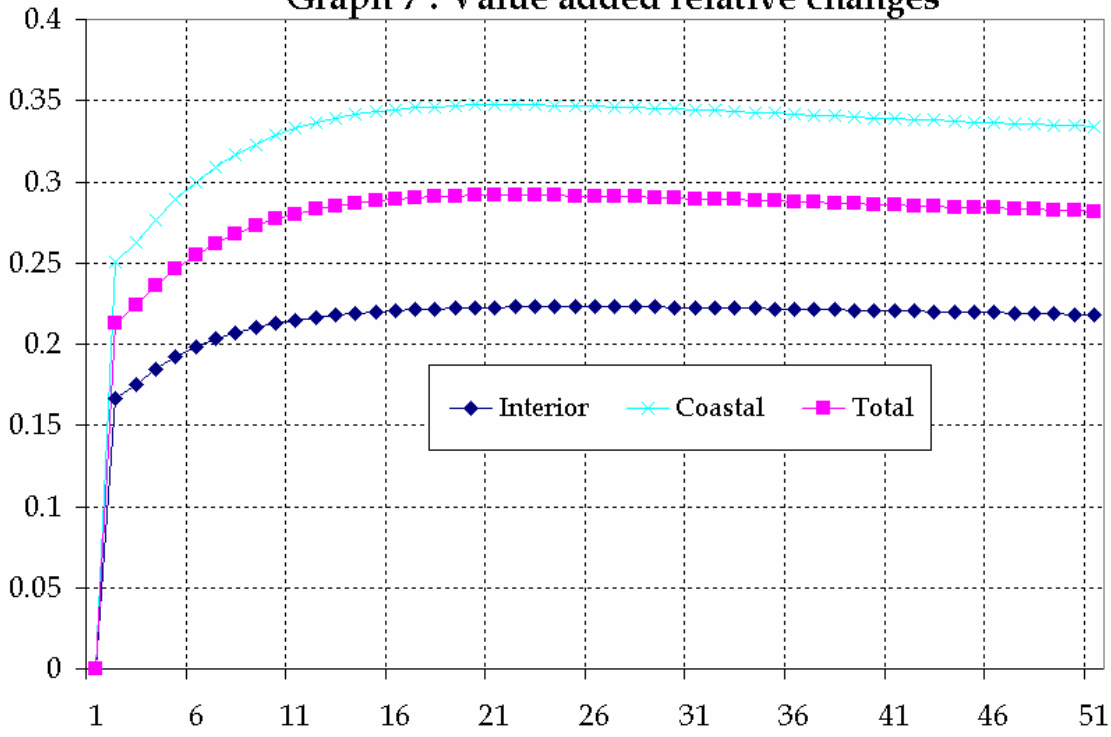


Shock A : Decrease in foreign tariffs

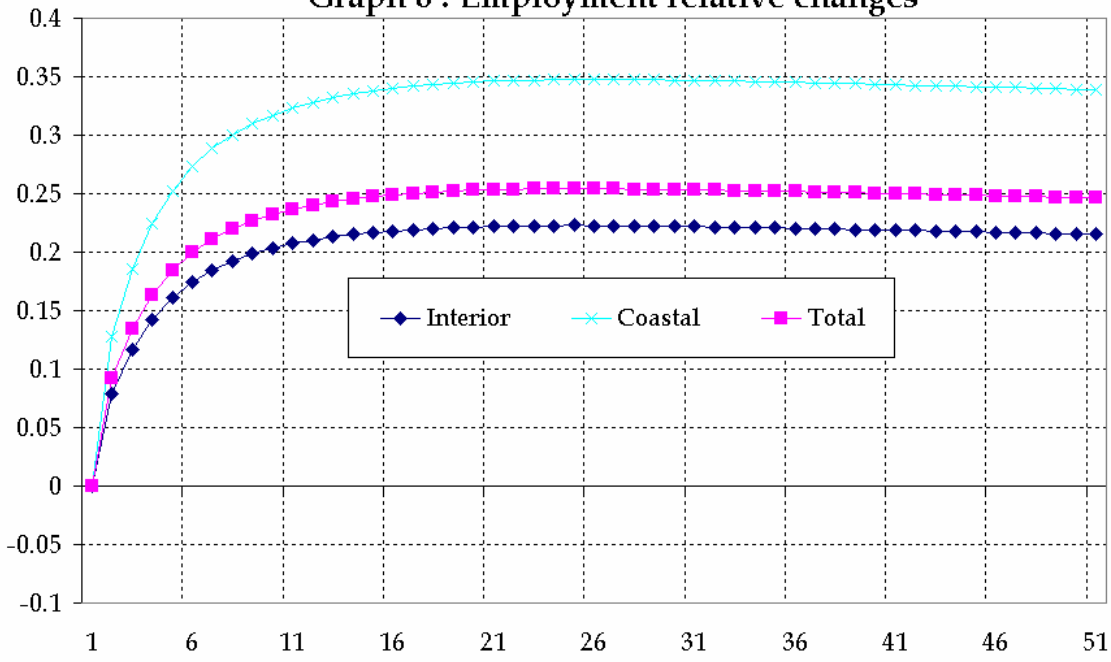
Graph 6 : Value added relative changes



Shock A : Decrease in foreign tariffs
Graph 7 : Value added relative changes

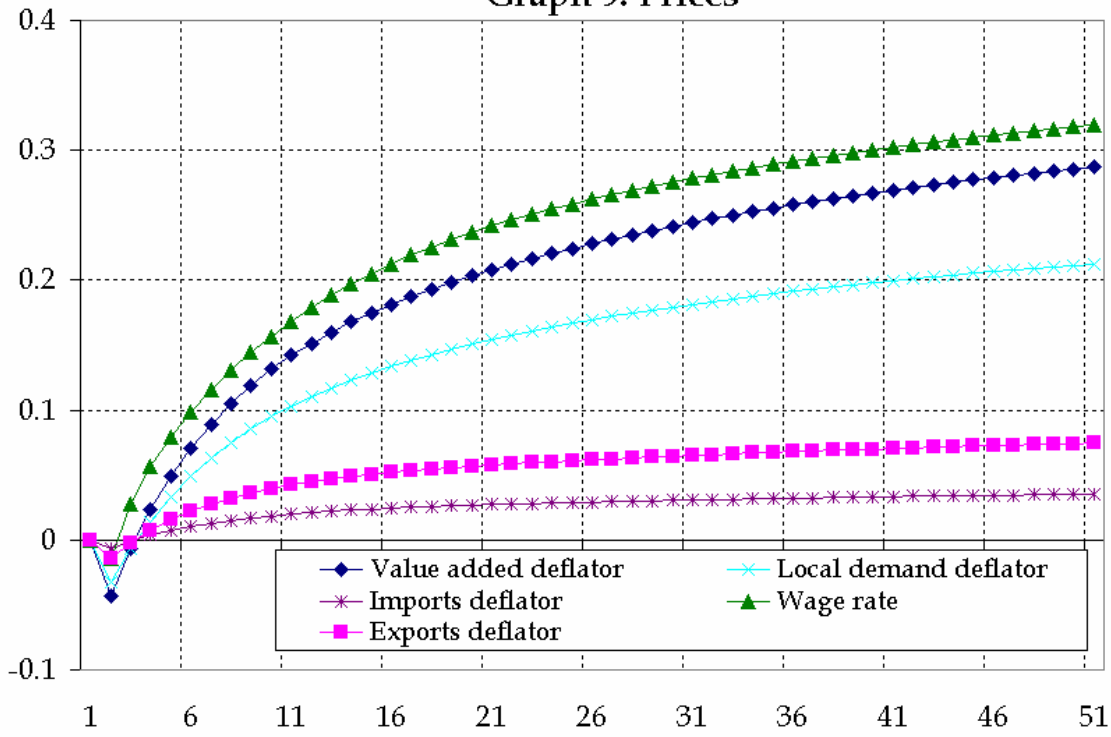


Shock A : Decrease in foreign tariffs
Graph 8 : Employment relative changes

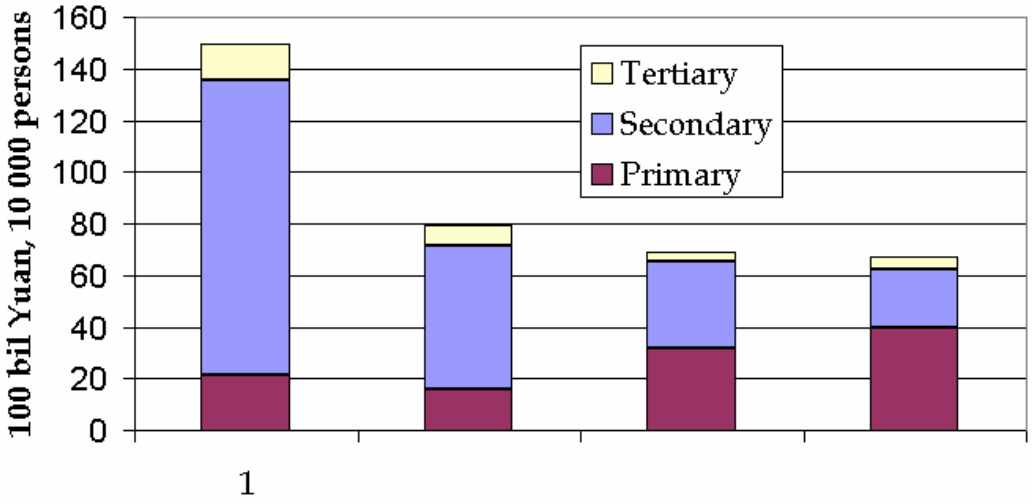


Shock A : Decrease in foreign quotas

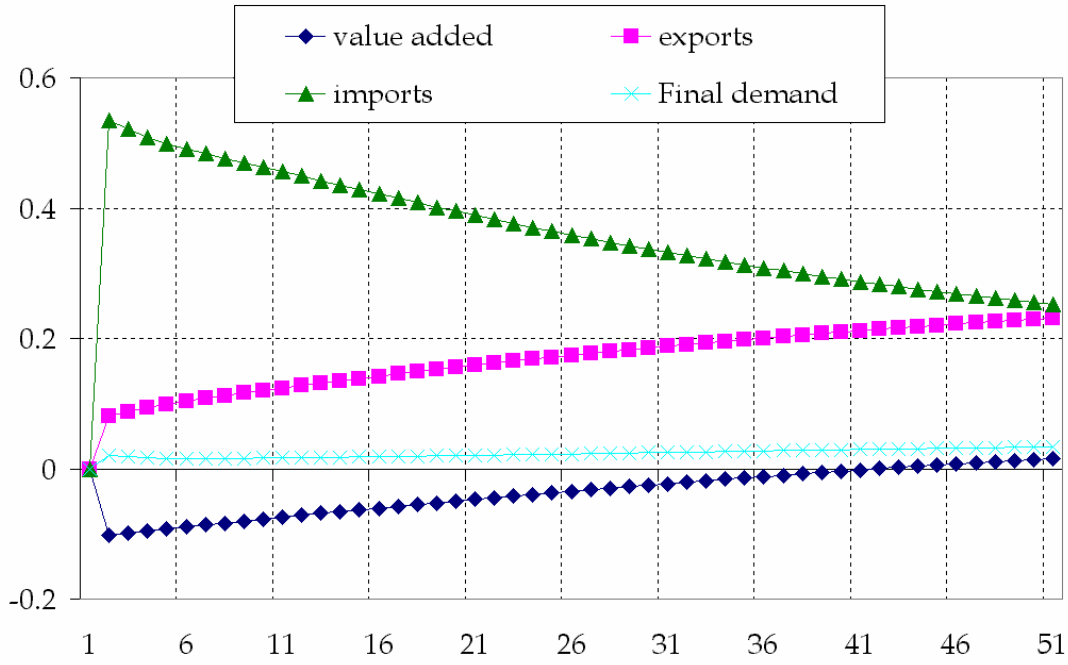
Graph 9: Prices



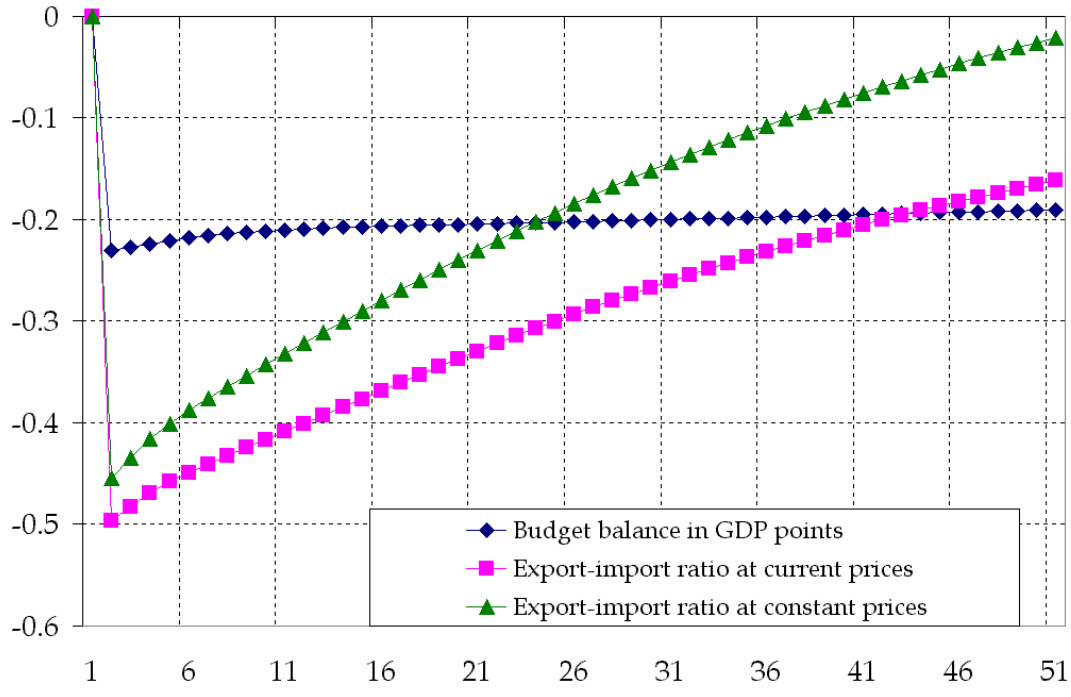
Graph 10 : Value added and employment after 5 periods



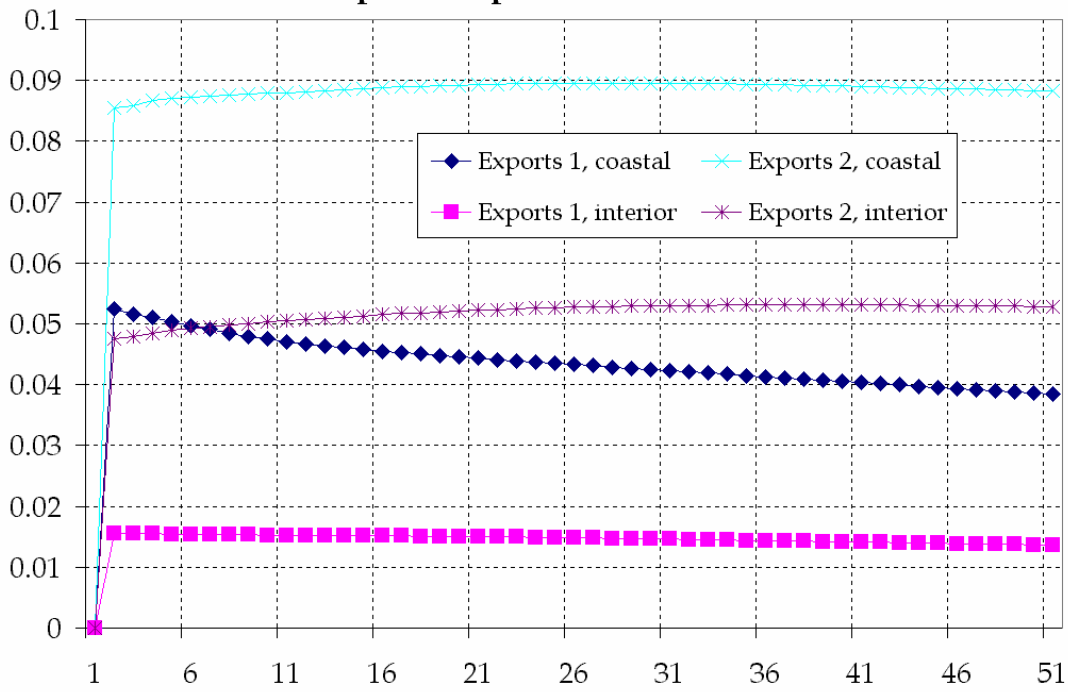
Shock B : Decrease in local tariffs
Graph 1 : Global variation of supply and demand



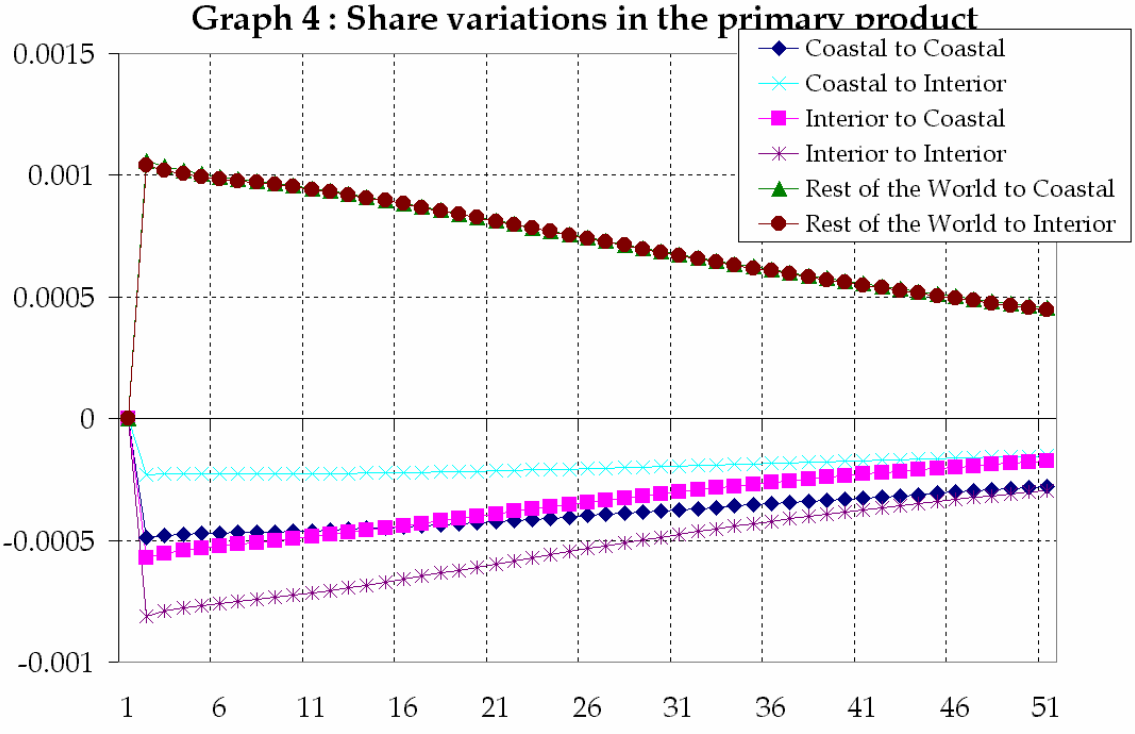
Shock B : Decrease in local tariffs
Graph 2 : Trade and State balances



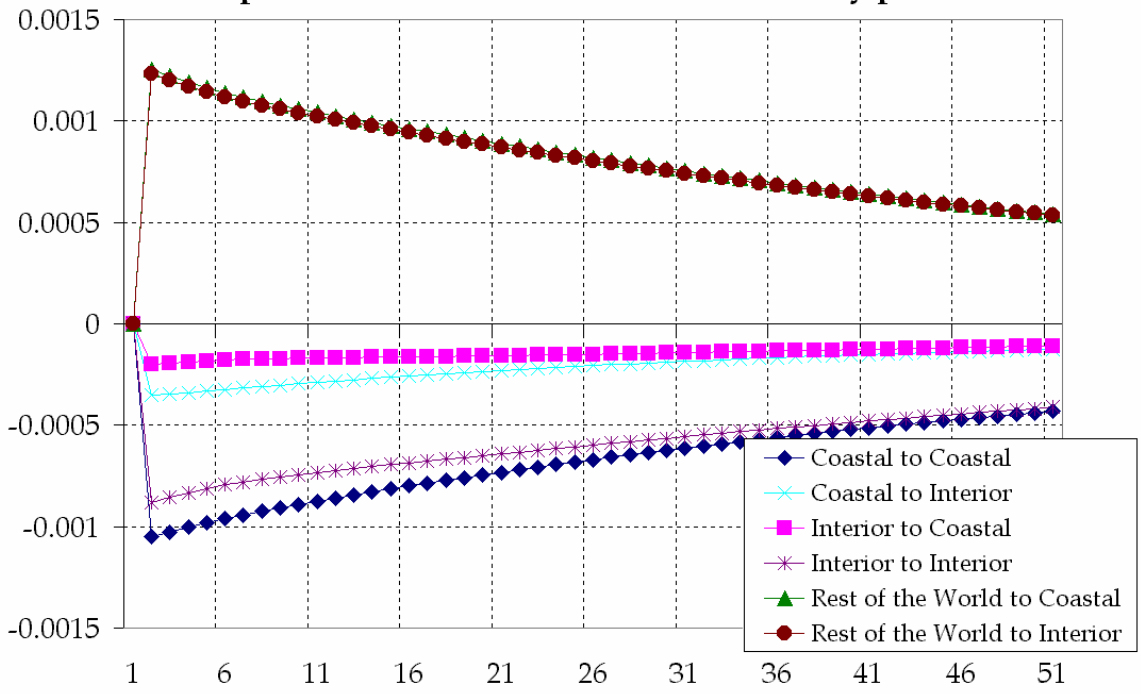
Shock B : Decrease in local tariffs
Graph 3 : Export to value added ratio



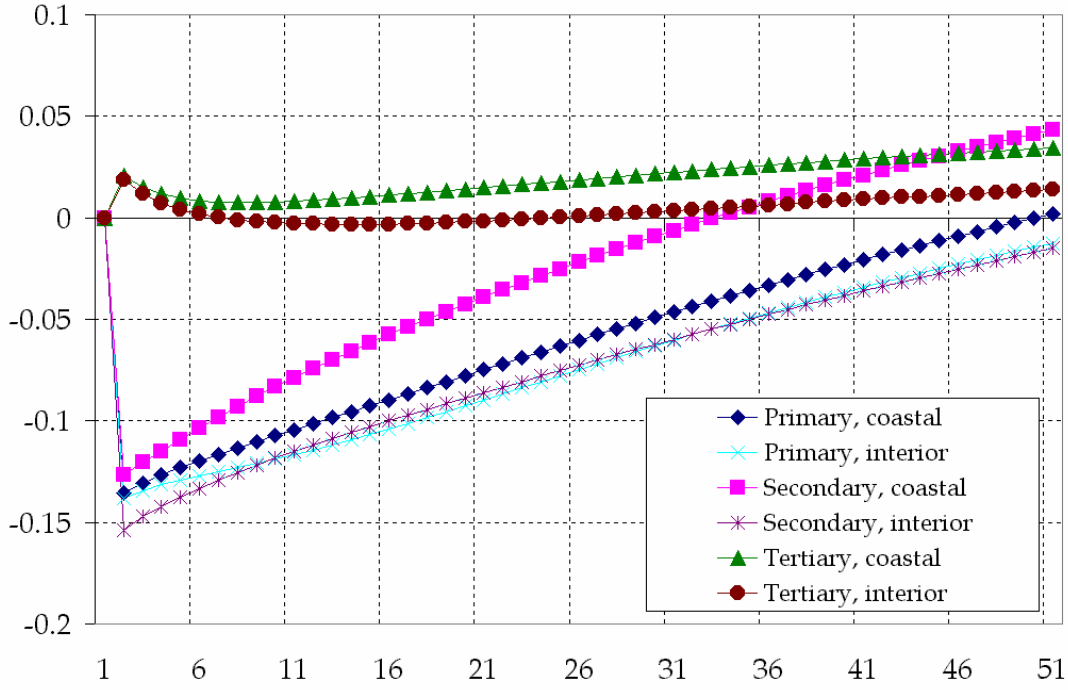
Shock B : Decrease in local tariffs
Graph 4 : Share variations in the primary product



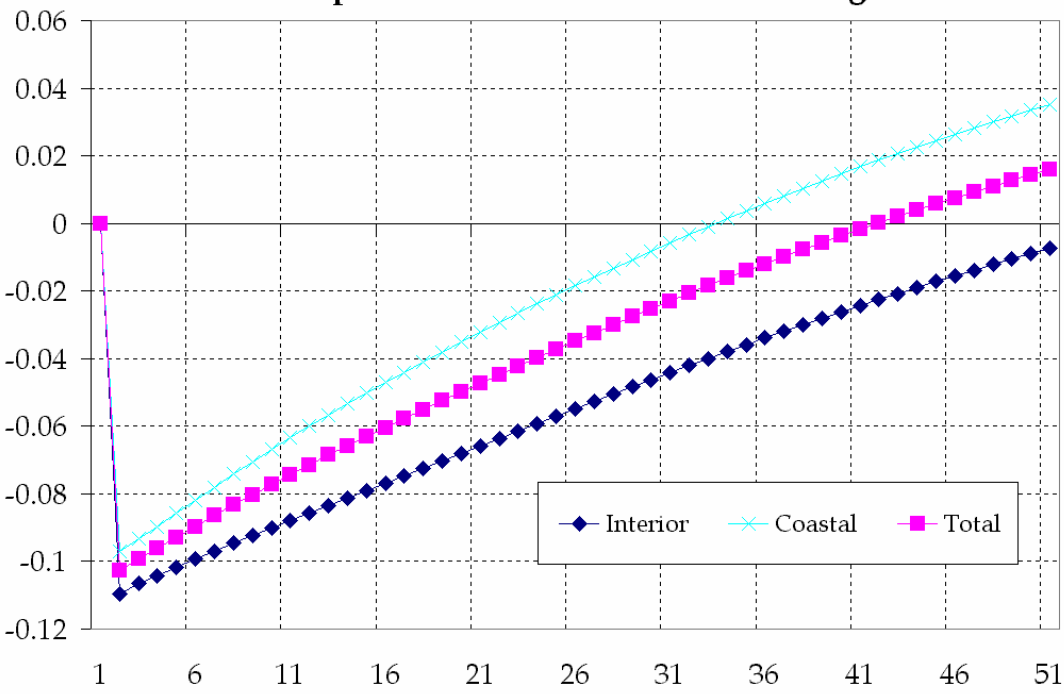
Shock B : Decrease in local tariffs
Graph 5 : Share variations in the secondary product



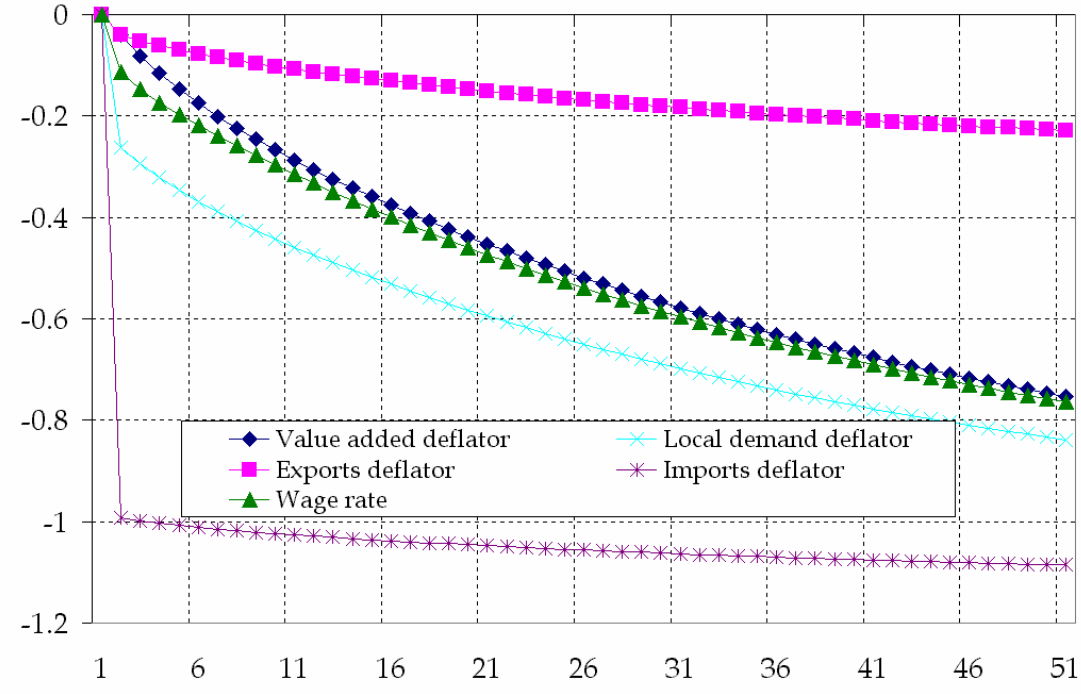
Shock B : Decrease in local tariffs
Graph 6 : Value added relative changes



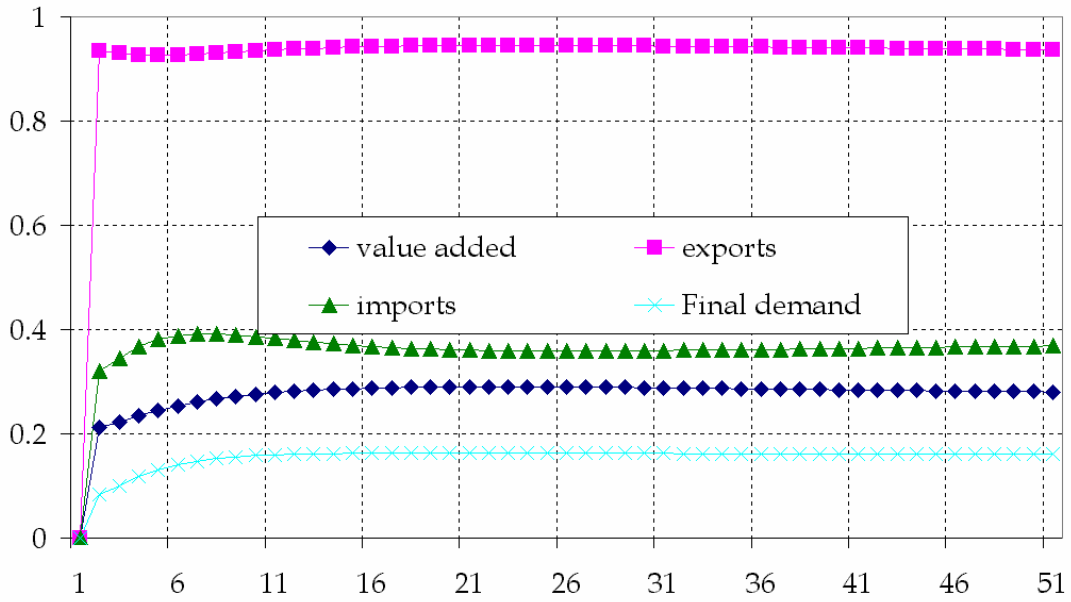
Shock B : Decrease in local tariffs
Graph 7 : Value added relative changes



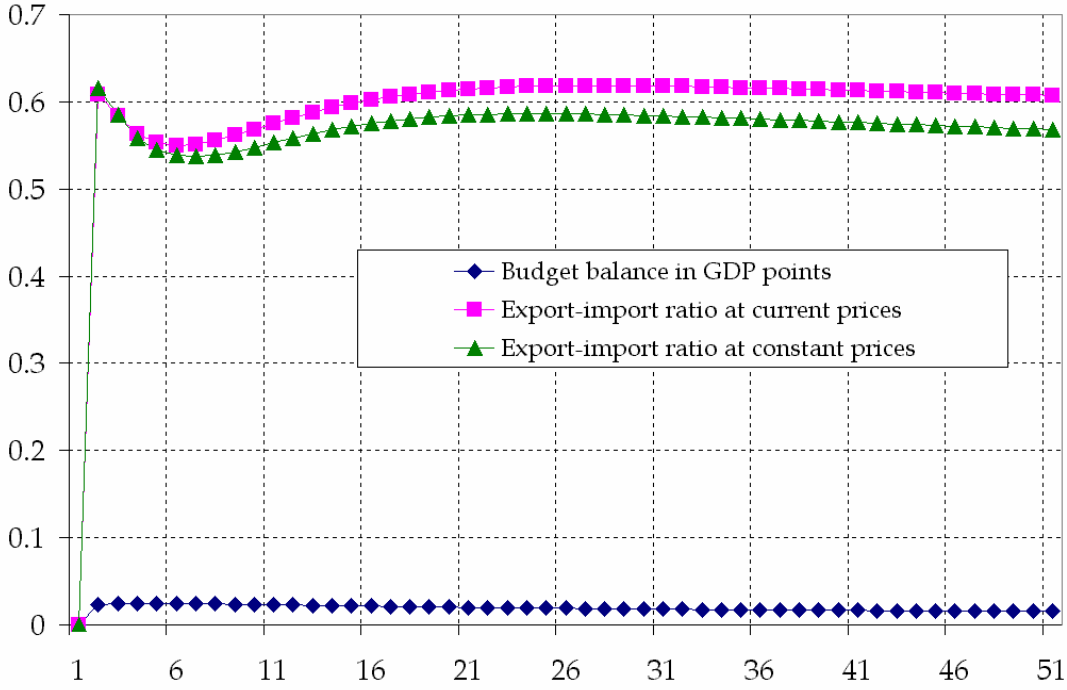
Shock B : Decrease in local tariffs
Graph 8 : Prices



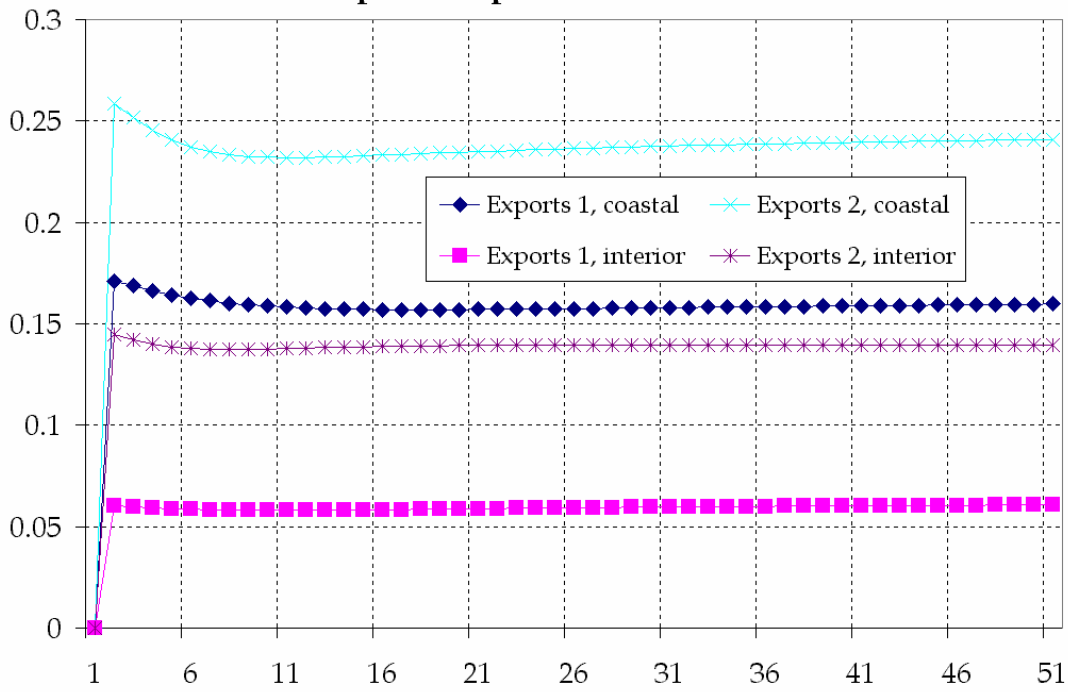
Shock C : Decrease in foreign quotas
Graph 1 : Global variation of supply and demand



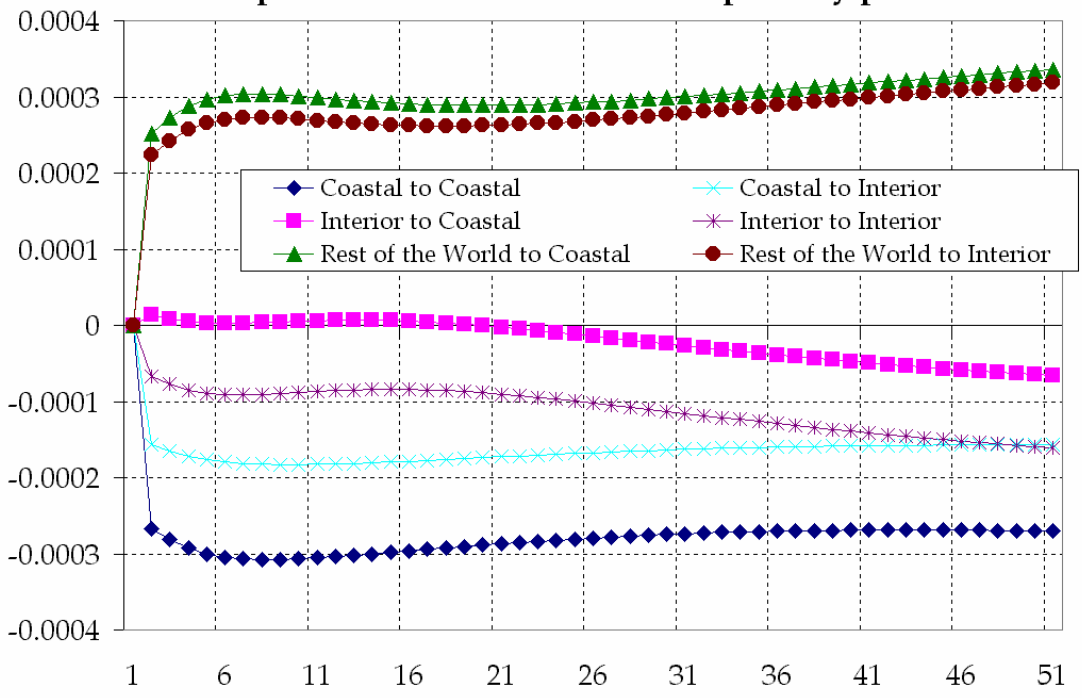
Shock C : Decrease in foreign quotas
Graph 2 : Trade and State balances



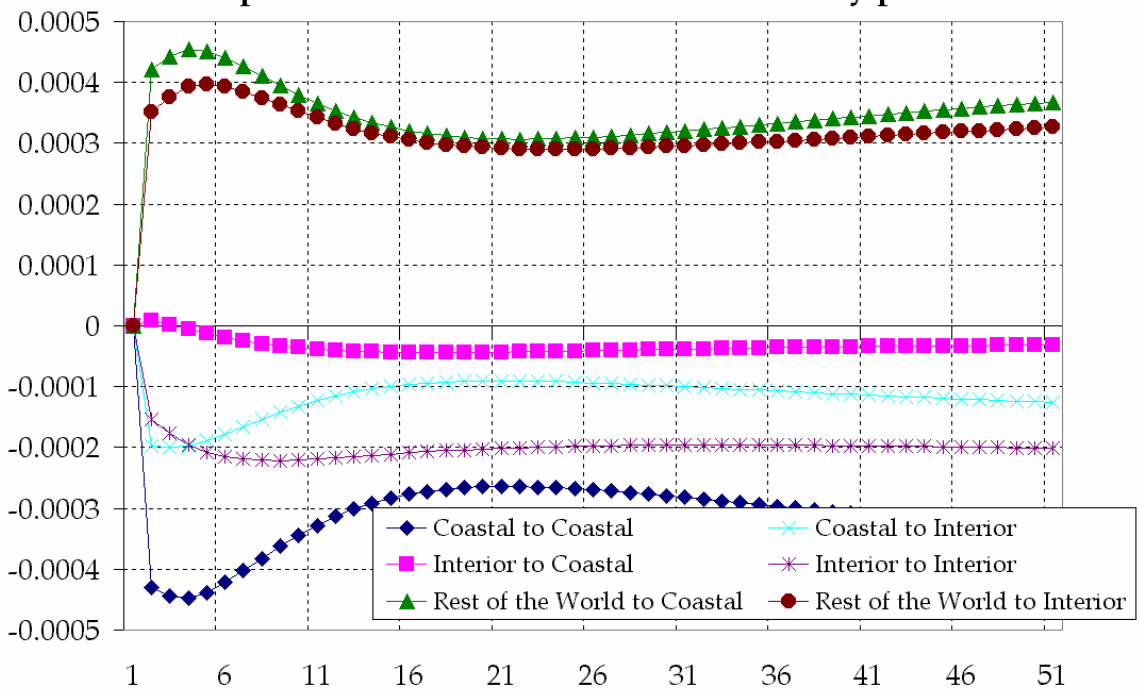
Shock C : Decrease in foreign quotas
Graph 3 : Export to value added ratio



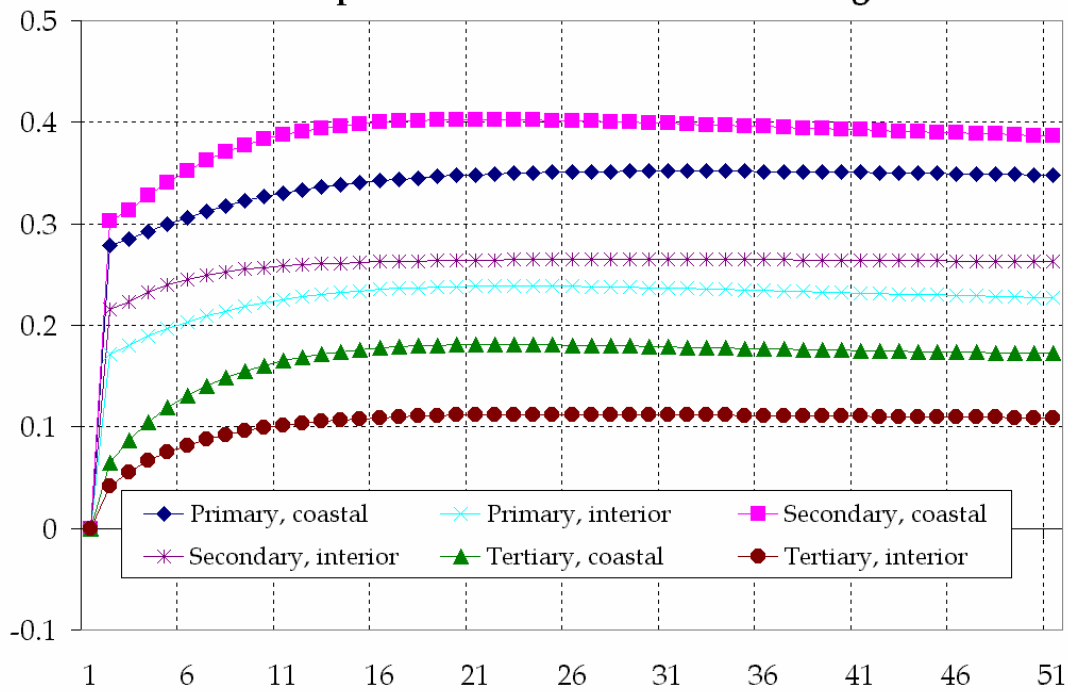
Shock C : Decrease in foreign quotas
Graph 4 : Share variations in the primary product



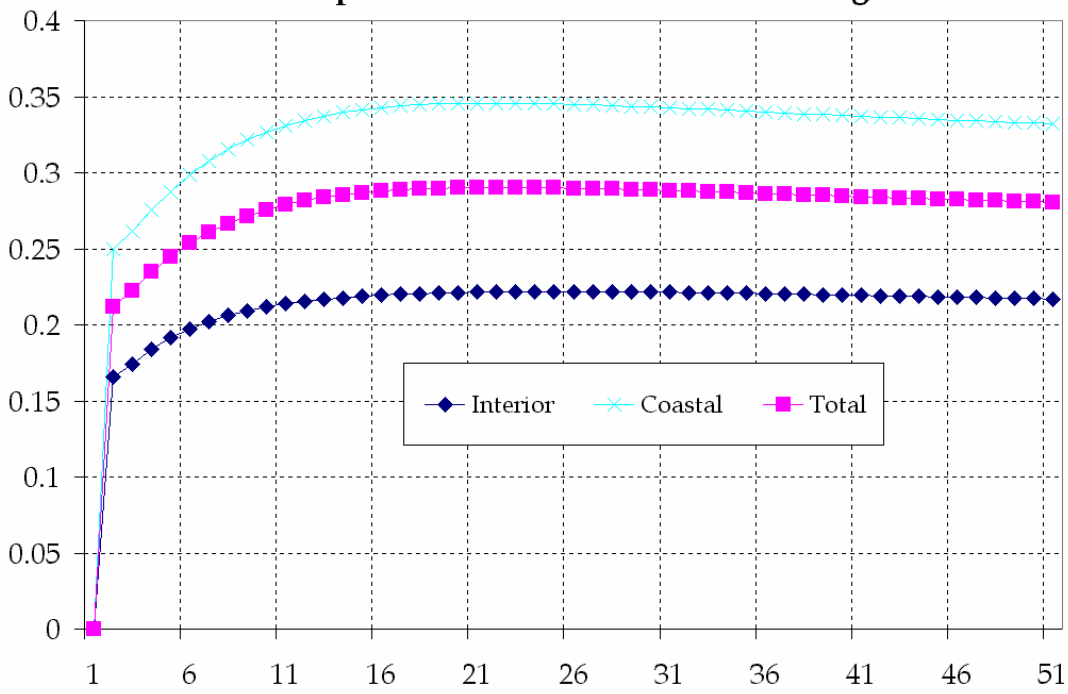
Shock C : Decrease in foreign quotas
Graph 5 : Share variations in the secondary product



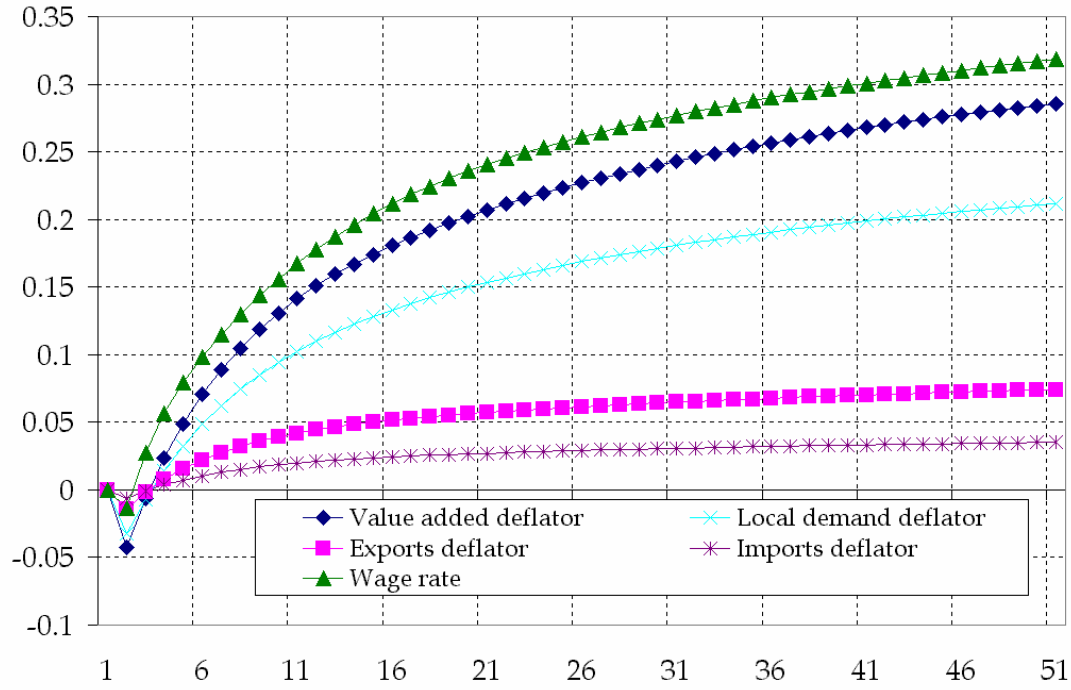
Shock C : Decrease in foreign quotas
Graph 6 : Value added relative changes



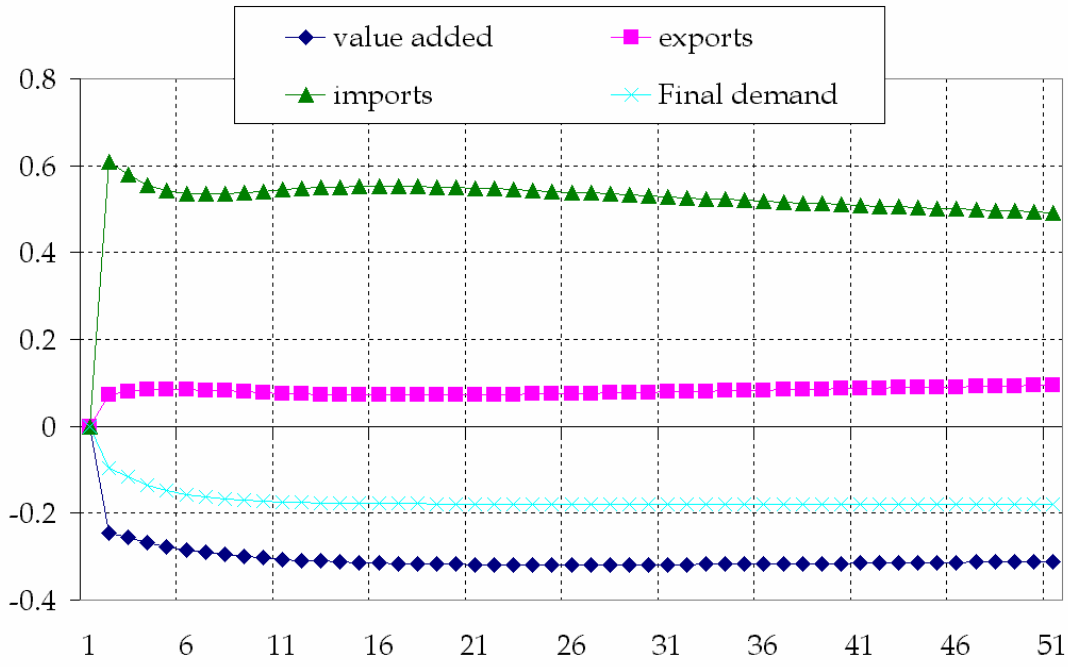
Shock C : Decrease in foreign quotas
Graph 7 : Value added relative changes



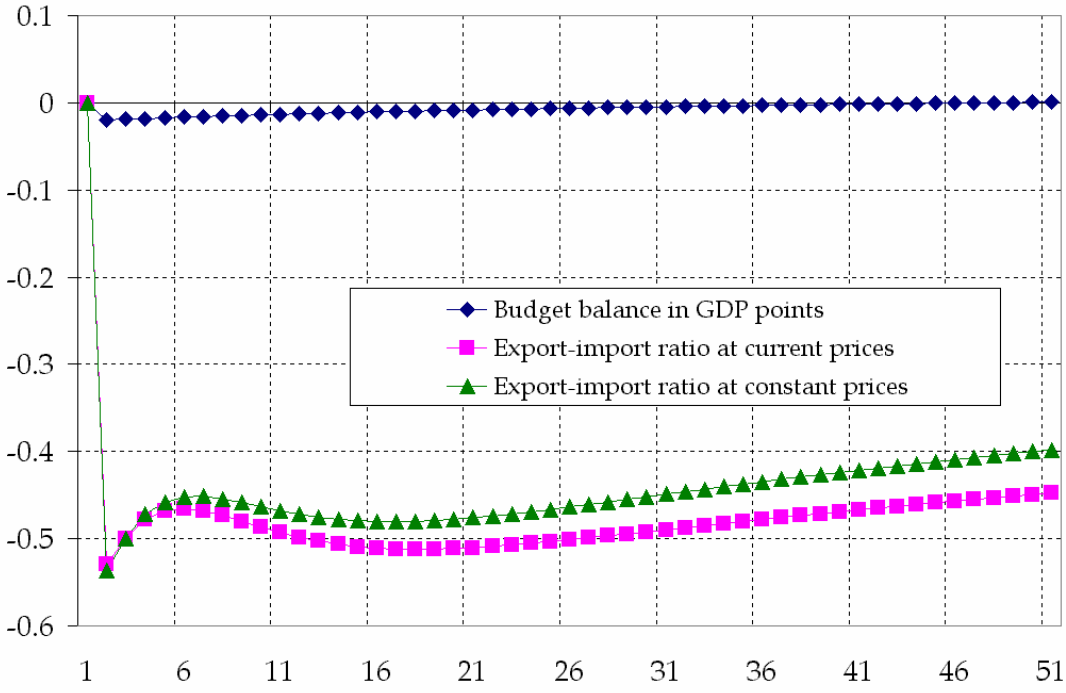
Shock C : Decrease in foreign quotas
Graph 8 : Employment relative changes



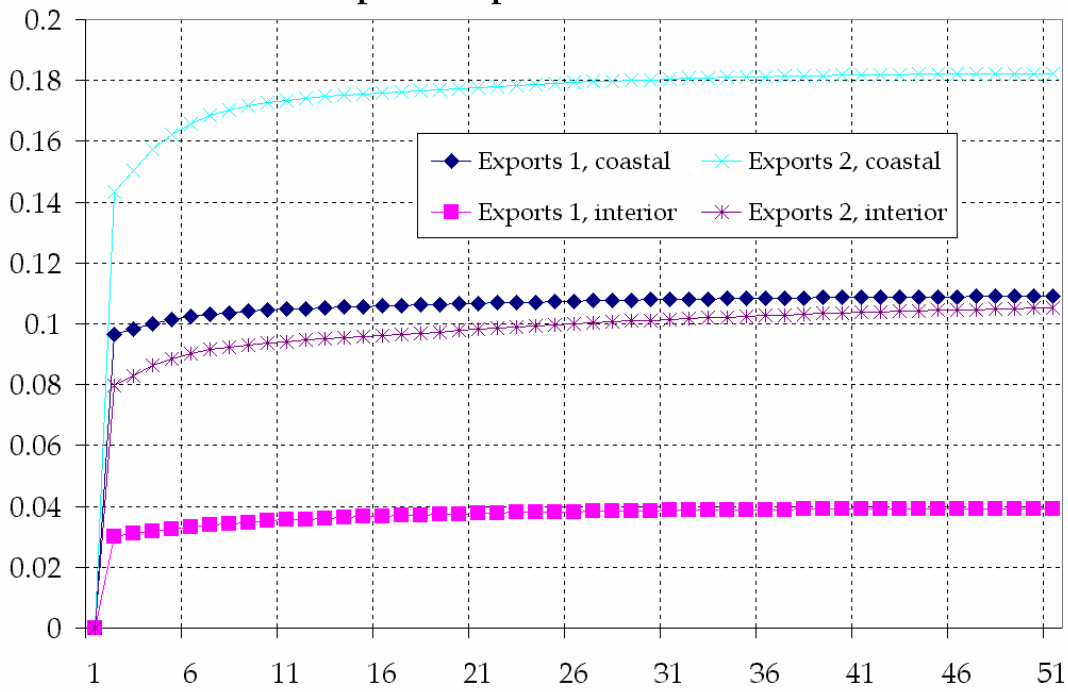
Shock D : Decrease in Chinese quotas
Graph 1 : Global variation of supply and demand



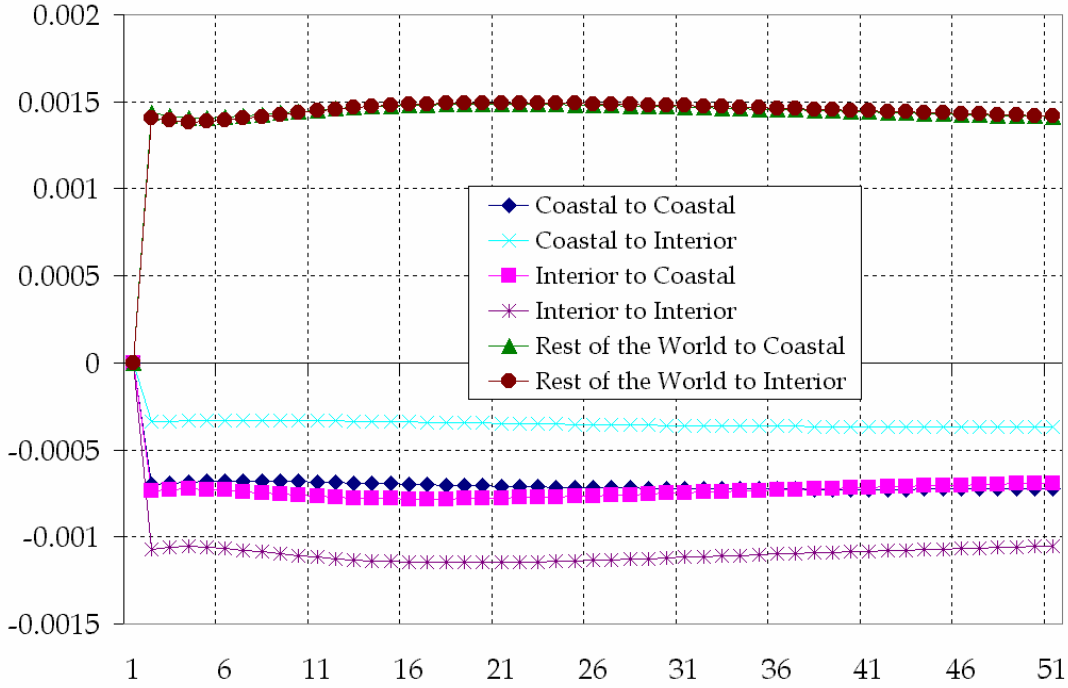
Shock D : Decrease in Chinese quotas
Graph 2 : Trade and State balances



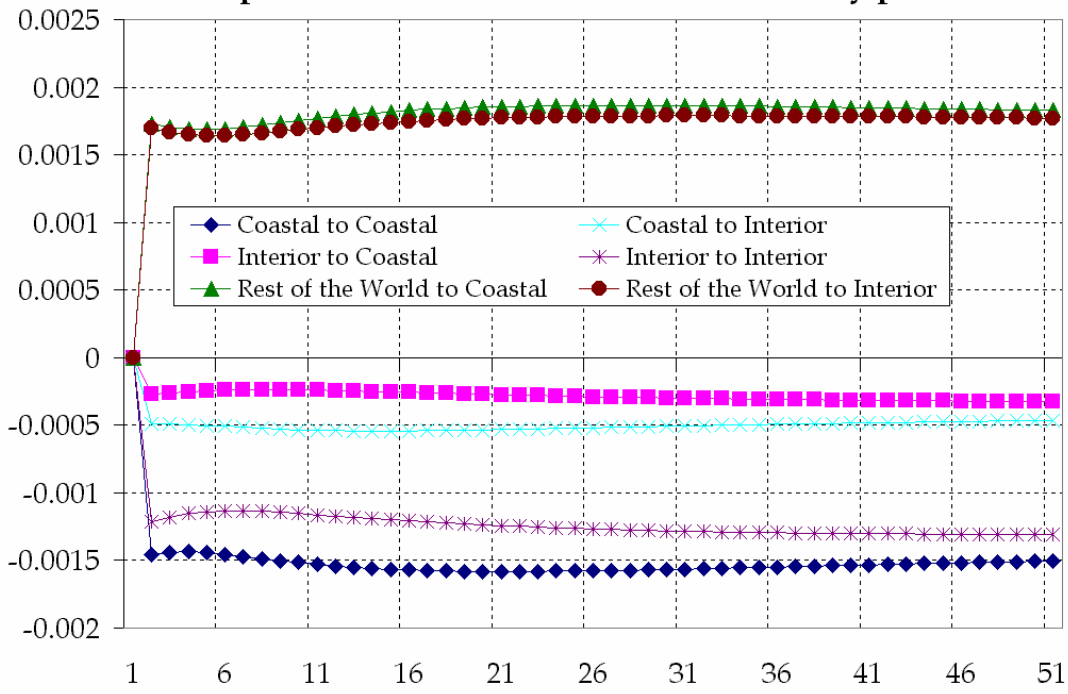
Shock D : Decrease in Chinese quotas
Graph 3 : Export to value added ratio



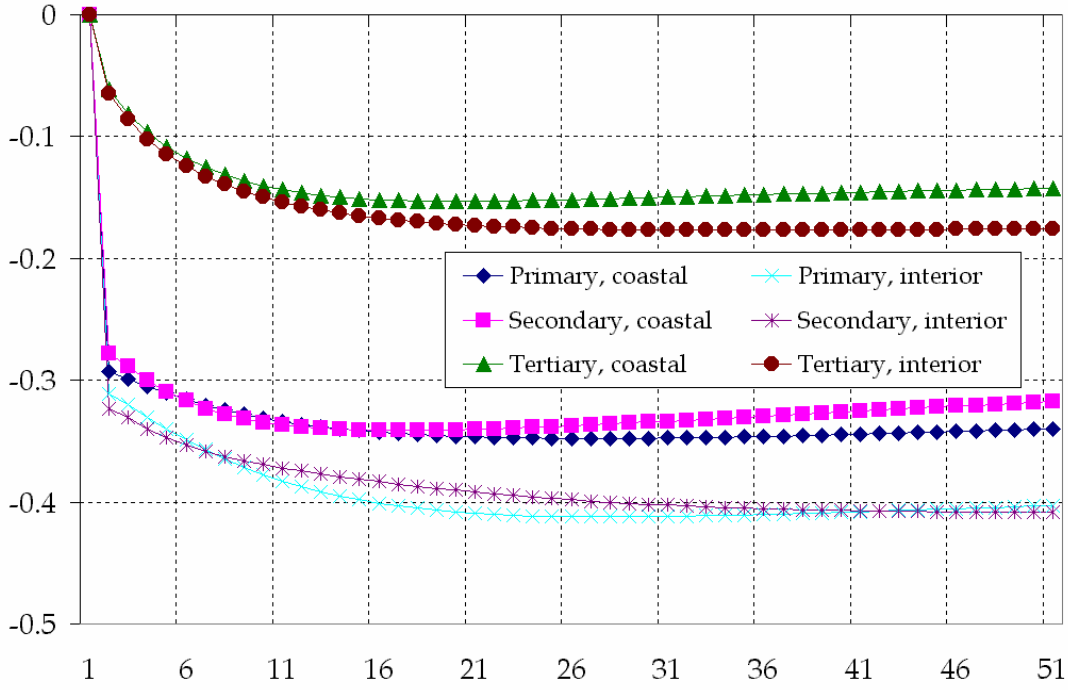
Shock D : Decrease in Chinese quotas
Graph 4 : Share variations in the primary product



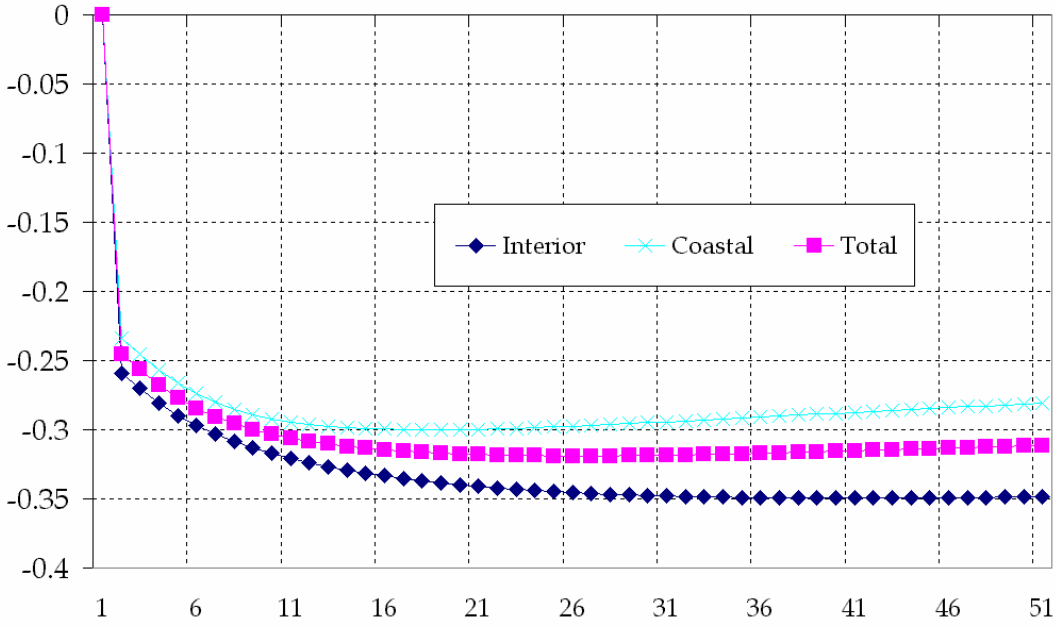
Shock D : Decrease in Chinese quotas
Graph 5 : Share variations in the secondary product



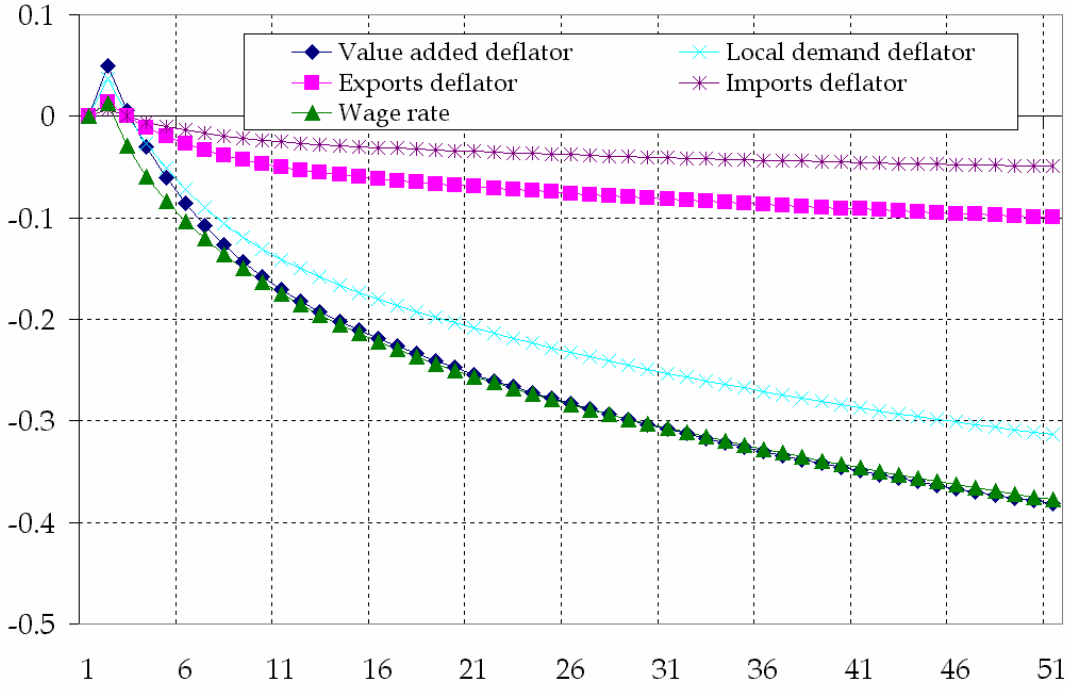
Shock D : Decrease in Chinese quotas
Graph 6 : Value added relative changes



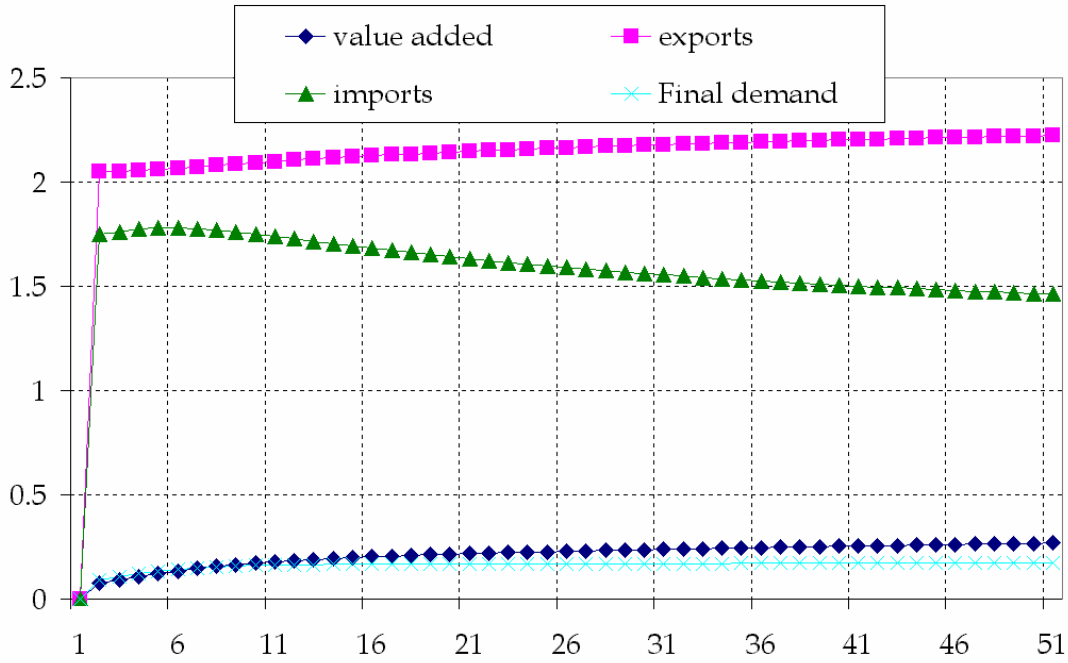
Shock D : Decrease in Chinese quotas
Graph 7 : Value added relative changes



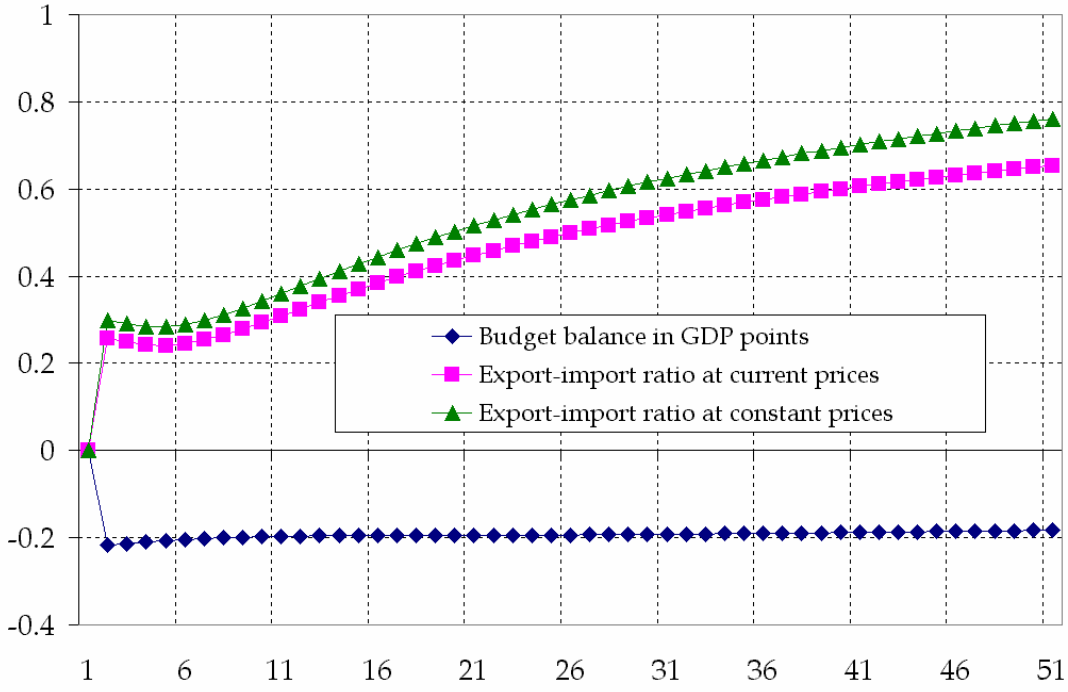
Shock D : Decrease in Chinese quotas
Graph 8 : Prices



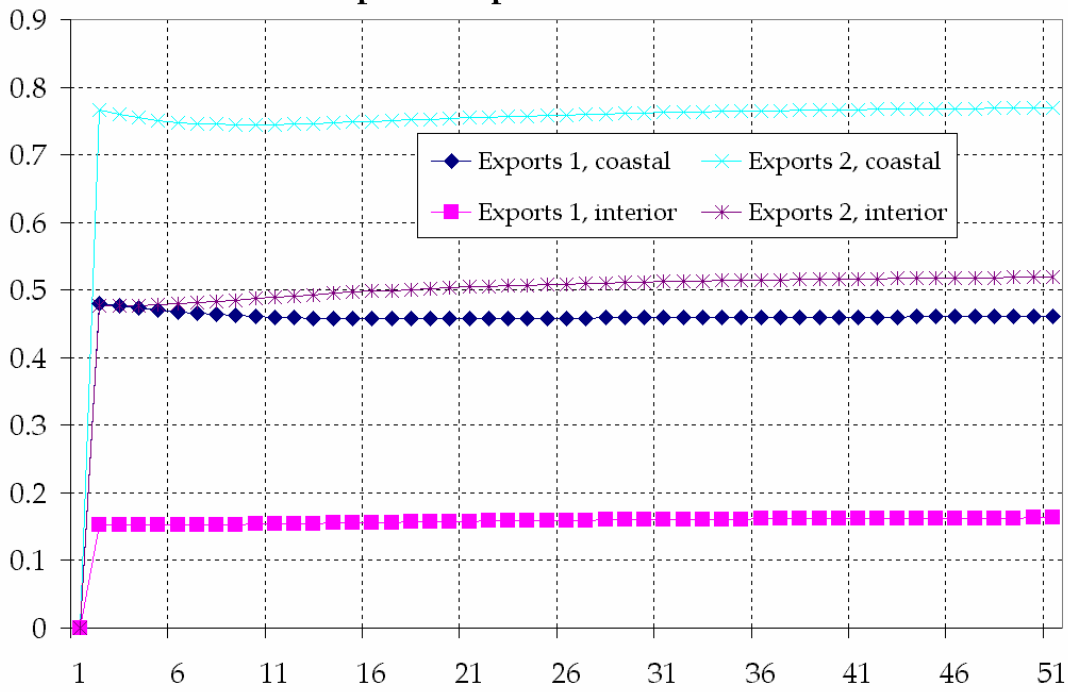
Shock T : Combined decisions
Graph 1 : Global variation of supply and demand



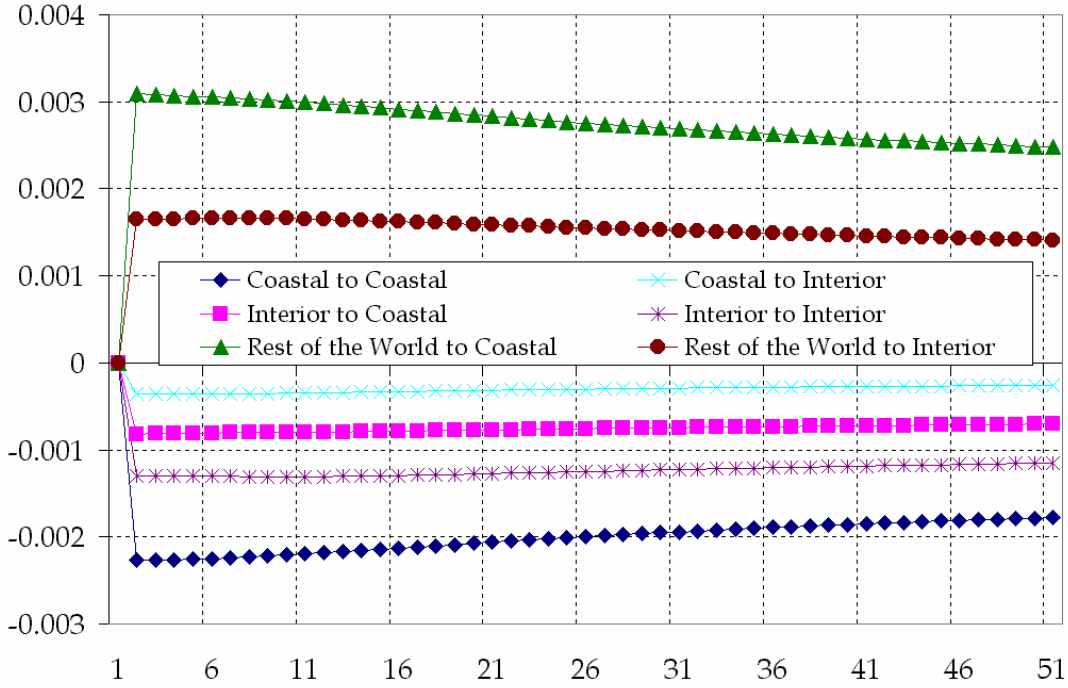
Shock T : Combined decisions
Graph 2 : Trade and State balances



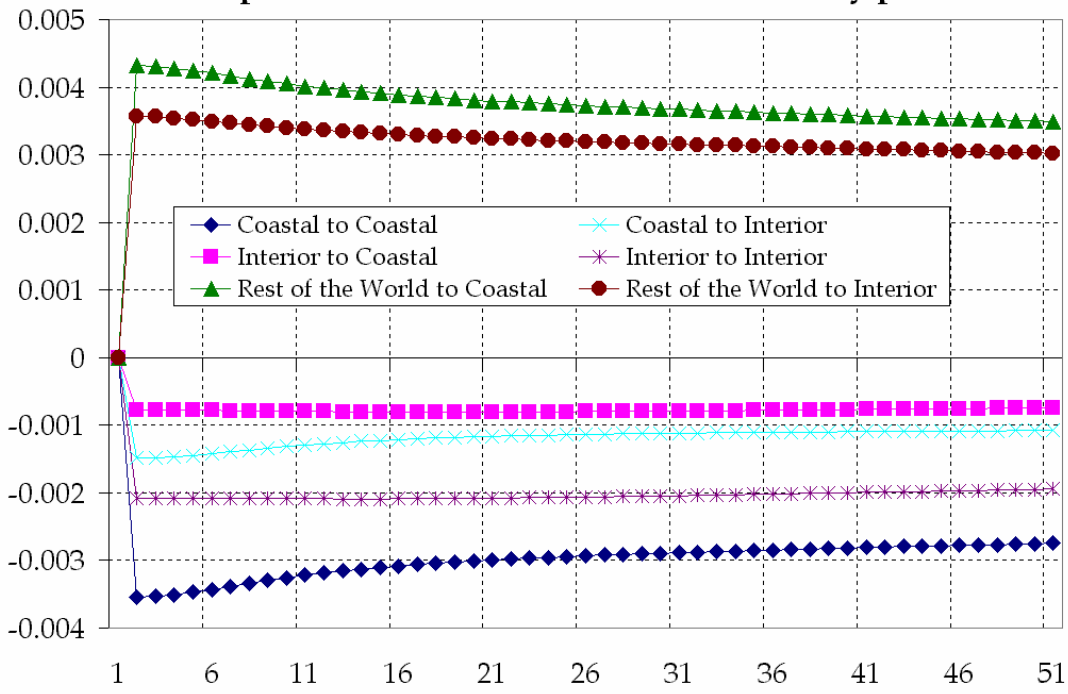
Shock T : Combined decisions
Graph 3 : Export to value added ratio



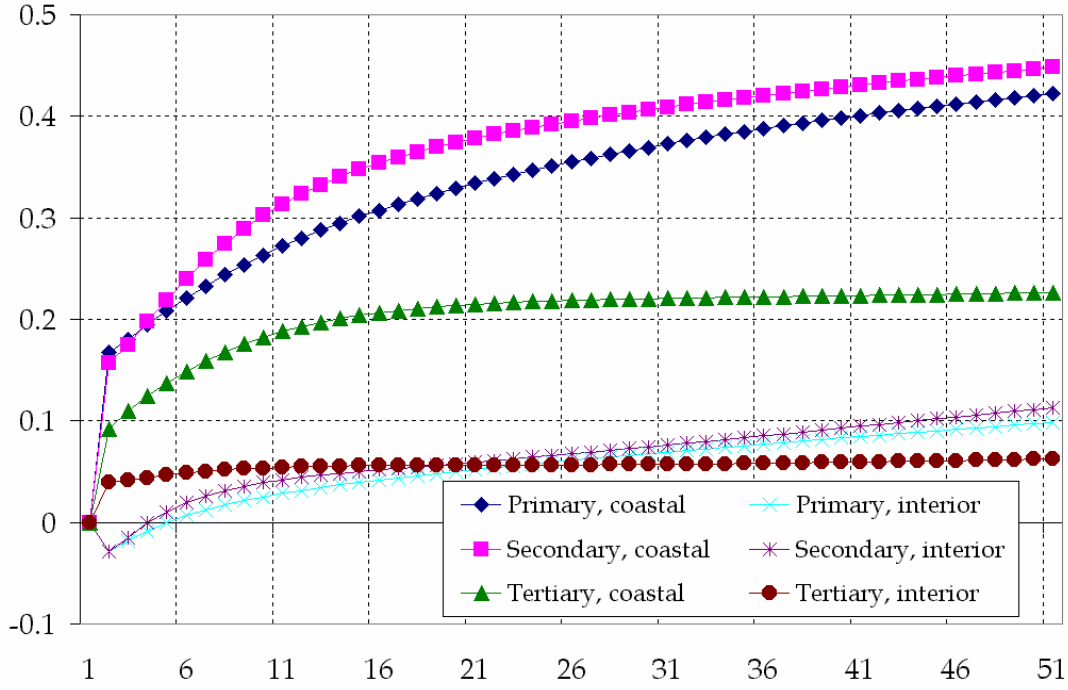
Shock T : Combined decisions
Graph 4 : Share variations in the primary product

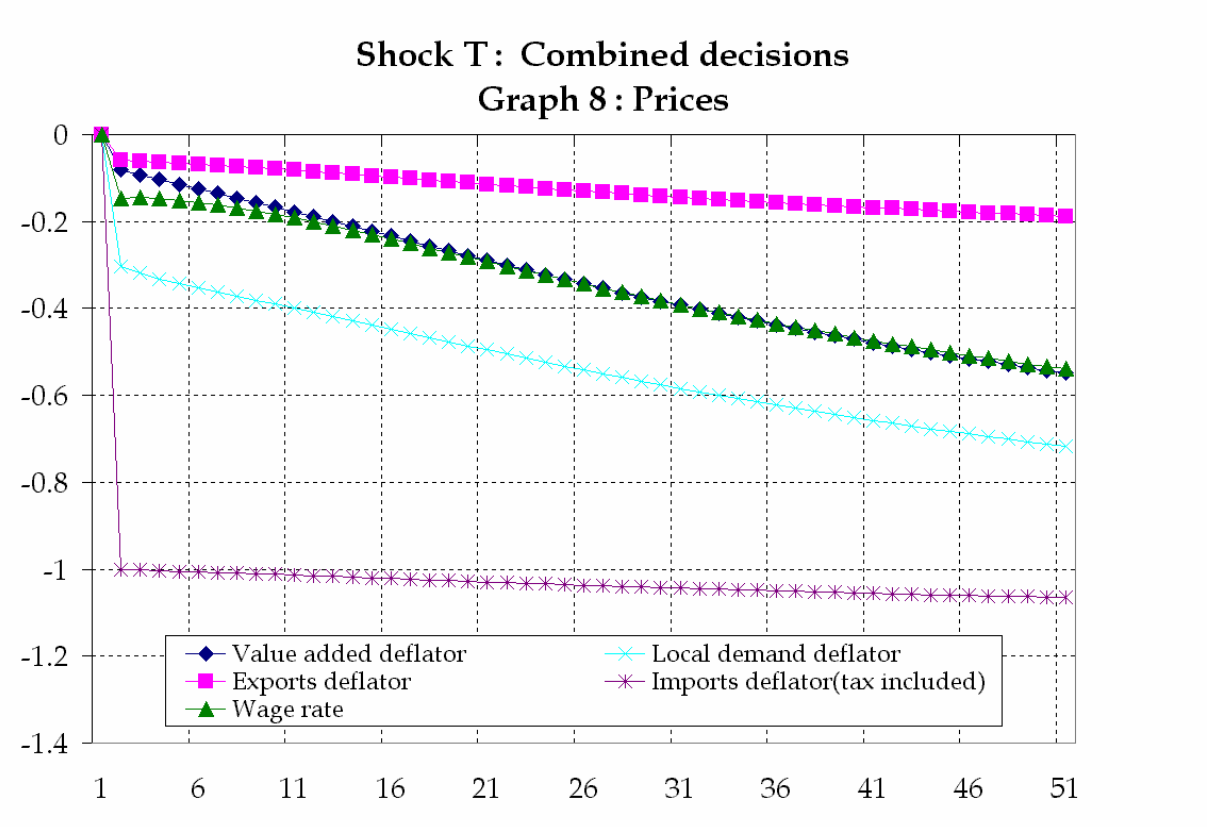


Shock T : Combined decisions
Graph 5 : Share variations in the secondary product



Shock T : Combined decisions
Graph 6 : Value added relative changes




Shock T : Combined decisions
Graph 8 : Prices
0
-0.2
-0.4
-0.6
-0.8
-1
-1.2
-1.4
1
6
11
16
21
26
31
36
41
46
51
Value added deflator
Exports deflator
Wage rate
Local demand deflator
Imports deflator(tax included)