Vietnam : the consequences of trade agreements, in the light of the Trans Pacific Partnership

Jean Louis Brillet

We shall present in this docment the consequences of trade agreement shocks on the Vietnamese economy, starting in 2014.

For this we shall use a 5 product annual macroeconometric model, developed for the local Ministry of Planning and Investment.

This is the list of the shocks, with the product or sector decomposition.

We will also present the consequences of independent shocks on the foreigh environment

In a future paper, we shall synthetize these results using the actual decisions, which have not yet been decided.

# The general options of the vietnamese model

Let us start with general ideas. The present structure of the model is globally neo-Keynesian. It contains

* Separate production functions for each good.
* The GDP price index depends on the cost of factors (the wages necessary to produce one unit of value added, and the amortization of capital), through a dynamic formulation. In the long run, the share of the combined cost in production will stabilize, at a level depending on the rate of use of capacity. Trade prices (import and export) combine a sensitivity to the exporter’s cost and the prices of their competitors. Applying these deflators to the supply - demand equilibrium, demand can be computed ay current and constant prices, and its deflator is obtained as a ratio. Finally, individual demand deflators are computed as deviations from the global value, with a unitary long term elasticity.
* The wage rate is partially indexed on inflation in the short term. Its long term value ensures reaching a target share of wages in value added, affected by the unemployment rate.
* A dynamic definition of household consumption is based on revenue. Household revenue is the sum of wages (employment x wage rate) and non-wage revenue, decomposed into a non-wage revenue from production and transfers from the State..
* External trade at constant prices (exports and imports) depends on the associated demand (world or local), the associated price competitiveness, and available capacities (for imports).
* GDP itself balances the supply-demand equation.
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Two remarks concerning the presentation:

* In the following equations, the endogenous variables will use capital letters, the exogenous small letters.
* The “time” variable use the four figures in the date.

# Product decomposition

## The main reasons for 5-product decomposition

There are two main reasons for this decomposition:

* The decomposition allows to evidence structural differences.
* This appears when a given change in endogenous elements external to the classification, or exogenous structural elements pertaining to the product.
* For some economic element or field, the links between variables follow different mechanisms, calling for different specifications which cannot summarized by mathematical aggregation.

### Structural differences

They can be identified easily within the framework of our model. The main elements are :

* Factor productivity : the quantity of labor and / or capital necessary to produce one unit of good can be different. This is particularly true for agriculture, in which labor productivity is particularly low. And also for services, where the need for capital is generally limited.
* The (yearly) wage rate : the average yearly wage obtained by workers can be quite different (linked often to labor productivity, which can offset the effect when we consider the unit cost).
* The different shares in each demand item, allow to present different sensitivities to a given increase in consumption or in investment.
* The amount of intermediate consumption of each good needed to produce one unit of a given good.
* The sharing of production destination between the local and foreign markets (exports).
* The sharing of local demand between the local and foreign producers (imports).
* The separation between firms and households in the production process, with different consequences on revenue and its use.
* The taxation of goods (VAT, other indirect taxes, tariffs on local imports and exports).

All these elements will be taken into account simply by separating the goods in the model.

An additional issue : once agriculture has been identified (and in this case only) it appears immediately heterogeneous, between artisanal and industrial.

For the first category:

* Productivity of labor is much lower.
* Employment depends less on output, as family members, otherwise inactive, can be called if the increase is not too high.
* The use of machinery and additives (fertilizer, fodder) is less frequent.
* The whole revenue from production is appropriated by the producers, which means by households.
* The share of exports in output is lower. This calls, at least for the productive process, to separate further product 1 in those two categories.

### Economic differences

They concern two main fields

#### The production process

In the agricultural sector, one can assume that producers maximize their output. For this, they can use plantations (fields and trees), and animals, or a combination of both (like young fish and lakes). They need also a minimum amount of labor, tools and intermediate consumption (like fodder). Increasing these levels can improve output, as well as better infrastructures (irrigation, storage and transportation facilities). But once these are defined, production follows, corrected heavily by unforecasted climatic conditions. This is true also of fishing. The impact of an increase in demand is limited (even if perhaps more cattle will be slaughtered, or more fish will be caught).

In the manufacturing sector, we can assume the availability of different processes, among which the producer will chose according to the relative costs of capital and labor. Assuming a constant and unitary elasticity leads to a Cobb-Douglas formulation. We can also chose a simple complementary factors specification, as well as a more general CES function. Actually, one of the advantages of product identification is to associate a sophisticated function to the goods which actually deserve it. In the single good case, the elements of the alternative: using a simpler function or associating a sophisticated Cobb-Douglas framework to the whole economic spectrum are both harmful to model quality.

But the main advantage of this identification is to define a productive capacity, and the associated rate of use. This element will play an important role (as we shall see later) in four behaviors : the role of role producers in the satisfaction of local and foreign demands, the investment behavior, and the short-term choice by firms of the mark-up applied to the production cost.

The construction sector is similar to manufacturing. The main difference lies in intermediate consumption, as there is none for this product. Also, there are less production processes available.

Finally, in both financial and non-financial services sectors, the choice of factors can depend on the relative cost (computers will replace people), but the role of capacity is less clear, as in many cases producers have a considerable leverage on output, independently of installed capital and even employment: a sudden increase in the demand for touristic trips can generally be met by travel agencies. The quality of the service will probably decrease, but not its cost, the element by which the output is measured. In the financial sector, loans can increase at a relatively stable cost.

#### External trade

The trade in agricultural goods, manufactured goods, construction and services follows obviously different rules.

For agriculture, the world price is generally set for a given quality, and a given share of the local production is proposed on the foreign market, according to the type and quality of goods, local policy, pre-established contracts, or the relative export and local prices.

 For manufactured goods, additionally to demand, price competitiveness is essential, as well as available capacity which can create temporary bottlenecks on the supply of specific elements.

There is no trade in construction, even if production needs imported goods (like steel) and Vietnam can export goods used for construction by other countries.

For both types of services, the determinants are completely different and much less clear, but the amounts traded are less important (except for tourism which is quite difficult to model).

We could expect non-financial services to depend on household revenue and GDP, as intermediate consumption of firms. As to financial services, in addition to the above, they could depend on the level of loans and the interest rates.





# The shocks

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | categories | shocked | value |
| **Foreign environment** |   |  |   |
| Tariffs applied to foreign products  |  1, 2e, 2i, 4 , 5 | rate  | -1 point |
| Tariffs applied to Vietnamese products  |  1, 2e, 2i, 4 , 5 | rate  | -1 point |
| Tariffs applied to all products | all | rate | -1 point |
| Quotas applied to foreign products  |  1, 2e, 2i, 4 , 5 | residual | +1% of exports |
| Quotas applied to Vietnamese products  |  1, 2e, 2i, 4 , 5 | residual | +1% of imports |
| **Trade** |  |  |  |
| Exchange rate  | no | residual | +1% of the rate |
| World demand | 1, 2e, 2i, 4 to 5 | residual | +1% |
| Foreign prices | 1, 2e, 2i, 4 to 5 | deflator | +1% |
| Price of oil | 2E | deflator | +1% |

We will present two series of graphs and two tables.

The first set of graphs will summarize the evolution of the supply – demand equilibrium, for each of the products (if applicable) and for the whole economy at the same time.

The second set will apply to the whole economy, and give :

Graph 1: The supply – demand equilibrium (the same as above).

Graph 2: The elements of production: value added, employment, capital, capacity, rate of use.

Graph 3: The trade elements at current prices.

Graph 4: The export – import ratios.

Graph 5: The prices and wage rate.

Graph 6: The decomposition of demand in percentage.

Graph 7: The decomposition of demand in points of total demand.

Graph 8: The supply – demand elements in points of GDP.

Graph 9: The GDP of individual products and the average.

The tables will give:

* A summary of the main economic elements.
* The evolution of the Government budget in GDP points.

# Foreign trade shocks

## The exchange rate (Shock 1)

We shall devaluate the Dong relative to all the world currencies by 5%.

Let us first consider Graph 5.

We can see that all prices increase gradually, converging monotonously to a 1% value. Only wages grow faster, due to the improved activity and the subsequent gains in purchasing power. They even overshoot the 1% target a little, but will converge to this target soon.

The hierarchy is quite logical: the foreign price increase by 1%. The import price follows as the most influenced, then comes the export price, the consumption price (an average of local production and imports), and the value added price (the most “local”).

Graph 5 shows that the gains in competitiveness are important, if we compare the export price with the 1% line (representing the increae in the foreign price in Dongs), and the import price with the production price (not shown but half way between value added and consumption[[1]](#footnote-1)). This brings as usual exports, production, demand and imports.

These gains bring growth (Graph 1) coming mostly from local demand, and a small gain in net exports.

Concerning the trade balance, the change at constant prices is very small, compared to the loss on the terms of trade (Graph 4).

However, all these effects disappear with time at all prices converge to the target.

## The quotas on exports (Shock 2)

We shall increase World demand addressed to Vietnam by one point, starting in 2014.

By entering WTO, Vietnam has increased the market for its products, independently from competitiveness or supply. Our shock leaves unchanged such external assumptions as world inflation and world available capacities.

The consequences of this shock might appear strange at first look. Measured in real terms, the trade balance deteriorates over the whole period.

The explanation is simple: first, the gain in exports is limited in the short run by capacity problems, and in the long run by the loss in competitiveness coming from local inflation. These two elements combine into a reduction of the ratio of -0.2% compared to the ex-ante 1%.

But more important is the fact that an increase in exports has a strong impact on imports. This effect comes both directly, as exporting finished goods calls for imports of raw materials and energy products, and indirectly through local final demand, as the additional capacities needed to meet the additional exports call for investments and job creation, the latter increasing households consumption.

So the main improvement concerns Vietnamese activity itself: both GDP and local final demand show a significant increase, peaking in the medium run around 0.7% and 0.8%. Consumption grows slower, with the inertia on employment and the gains in the purchasing power of the wage rate. Investment is stronger in the beginning, when the gap between desired and actual capacities is the highest.

In addition, local growth generates inflation, and losses in competitiveness for VietNamese producers both on the local and foreign markets. However, this inflation has also a positive influence: as on the terms of trade. In current terms, the trade balance improves in the medium term, after an initial period when the need to adapt capacities increases the imports of equipment goods[[2]](#footnote-2)

As to the State budget, it is not directly affected, but taxes will profit somewhat from the improved activity. The gain is progressive and quite small.

**Conclusion**: as expected, all local elements improve, apart from prices, which follow the local increase of activity.

## The quotas on imports (Shock 3)

 One could expect to obtain results similar to the shock on foreign quotas, but with opposite signs. This is mostly the case, but not on trade variables, for reasons easy to explain.

Now the ex-ante shock applies to imports (and demand to local producers). The most important ex post consequence will be on exports, and imports themselves.

In our simulation, imports actually decrease, at least in the beginning. This apparently strange evolution is justified by:

* The openness of Vietnam to world trade (the export/GDP and imports/final demand ratios are close to unity and growing).
* The secondary increase of available capacity and local competitiveness (from deflation).
* The high sensitivity of demand elements such as investment to GDP fluctuations.

We can see indeed that ex post demand drops much more than GDP.

The real trade balance improves, but as this is obtained through a high loss on the terms of trade, the change in the current balance is very small.

In the long run, if the loss on consumption stabilizes, the adaptation of productive capacity to a lower level reduces the decrease in investment, thus demand and GDP (Graph 7). This has a negative impact on the trade balance.

Comparing with the shock on foreign demand, we do observe quite symmetrical dynamic evolutions, at different levels however.

**Conclusion**: as expected, all local elements stay negatively affected, except from prices, which are reduced following the local decrease of activity.

## The foreign tariffs rate (Shock 4)

Basically, the results are similar to the shock on quotas. What happens is that world demand addressed to Vietnam increases.

Of course this decision has an additional impact on world inflation, but considering the size of Vietnam we can consider it as negligible.

The main difference is that the gain comes from competitiveness. Subsequently it is subject to the elasticity of exports to this variable.

The estimated value gives 0.52 in the short term, and 0.56 in the long term.

The results are consistent with these values.

## The local tariffs rate (Shock 5)

Decreasing foreign tariffs is clearly beneficial for Vietnam. But the country 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 Vietnam do not change their own prices, using the situation to improve their margins.

For this shock, the mechanisms are more complex.

The competitiveness effect now favors imports, with a similar ex ante intensity due to the roughly equal coefficients.

We also have a capacity effect, which dampens the ex-ante loss: in particular, the increased attraction of imported goods does not mean that production of domestic goods of the same type will decrease by the same amount. in particular if local producers could not satisfy demand in the first place.

But now the decrease in tariffs will also affect local inflation directly, through the demand price. For firms, equipment goods will become cheaper, increasing ex ante the profitability of capital and raising the profits rate. In the medium term, the indexation of wages on a reduced CPI, and the lower amortization cost of capital, will also profit to firms, which will reduce their own prices and improve their competitiveness, both on the local and foreign markets.

The deflationary effect is quite strong, and reduces the loss in competitiveness: ex post, exports gain more competitiveness than imports. Nevertheless, imports grow more, but this comes only from local demand.

So as a result GDP grows immediately, driven by exports, as the improved competitiveness can use the capacities built for profit purposes.

 Of course, this shock has its drawbacks. As the trade balance considers untaxed elements, both real values and terms of trade concur to reduce it. And the cost on the state budget is high, the positive correction of the GDP growth being offset quickly by the interests generated by the cumulated debt.

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The deflationary effect is quite strong, and reduces the loss in competitiveness: ex post, the gains in exports competitiveness is comparable to imports, actually higher for the most imports product: manufacturing. Nevertheless, imports grow more, but this comes only from local demand.

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**Conclusion:** a decrease in tariffs reduces inflation, and gradually increases GDP, but at a price on the trade balance and the budget deficit. Structural shocks

## The price of oil (shock 6)

In this shock we increase the price of both exported and imported oil by 1% (we have also applied a separate shock, which is not too reasonable but helps to understand the results).

First, we have to cionsider that Vietnam is a net exporter of oil.

From the imports side, we observe the usual mechanisms : imports are more expensive, which increases the local prices. Wages follow, and the price –wage loop as well.

VietNam loses competirivess and the economy is affected negatively.

From the exports side (remember that it is the most important), things are a little more questionable, although quite logical. The reason is that in terms of profits, oil producers are aggregated to the manufacturing sector, and behave in the same way.Their revenue from exports increases , without losing competitiveness, their margins grow over the target and they decrease the price at which they sell oil on the local market. They also increase investment. This deflationary effect has the same effects as the increase in the imported oil price, except for the sign.

On the whole, as Vienam is a net exporter, the effect is positive.

This shows clearly that to take into account this shock, we must reflect on the behavior of oil producing Vietnamese firms. For instance, if they decide to keep the additional margins, the positive effects will be much lower (except for the producers’ budget, the State in practice).

Moreover,we cannot suppose that the world economy will not be affected. It is clear that an increase in the oil price should have a negative impact on work growth, and this should be introduced as a shock on world demand to Vietnam.

The model can very well take all this into account. The above just shows that when you make a shock, you have to decide if the behavior associated with the shock corresponds to the traditional economic mechanisms, which is the case most of the time. If not, you have to complete it by additional changes in assumptions.

## The shocks on both tariffs (shock 7)

We have just seen that it is possible to shock two different variables at the same time, as the two foreign pricesare associated with different assumptions. We shall now merge shocks 15 and 16, in other words shocks on foreign and local tariffs.

We will restrict ourselves to the global shock, even if more restrictive sets can be produced, and we could also expand the shocks to quotas, subsidies and any other exogenous assumptions.

The shock is the same as usual : -1 point on any rate.

The results are consistent with the individual message. GDP grows through export competitiveness : as Vietnam is a small country (especially compared to the rest of the world) the prices decrease as imports cost less, while the rest of the world is not affected.

The Vietnamese producers gain competiness on exports, and reduce the ex-ante loss on imports. This favors activity, especially manufacturing, but of course at a price in terms of Government revenue.

And the cost for the trade balance is important (although lower than ex-ante) combining losses at constant values and on the terms of trade.

## THE EXCHANGE RATE (SHOCK 1)



## THE QUOTAS ON EXPORTS (SHOCK 13)





## THE QUOTAS ON IMPORTS (SHOCK 14)





## THE FOREIGN TARIFFS RATE (SHOCK 15)





## THE LOCAL TARIFFS RATE (SHOCK 16)





## THE PRICE OF OIL (SHOCK 17)




## THE SHOCKS ON BOTH TARIFFS (SHOCK 18)




1. Production is composed roughly of 50% value added and 50% intermediate consumption). [↑](#footnote-ref-1)
2. Without this effect (for instance if we used a Purchasing Power Parity assumption), we would lose the gains on the terms of trade, but limit the loss on quantities, leading to a similar effect on the trade balance. [↑](#footnote-ref-2)