

Original Research Paper

Industrial Incentives in Niger: An Analysis in Terms of Domestic Resource Costs

Abdo Hassan Maman

Abdou Moumouni University of Niamey, Niger.

Accepted 24th April, 2017.

In this paper, we estimate the domestic resources cost coefficients (DRCC) in order to apprehend the major issues in terms of productivity in the manufacturing industry of Niger. The values of these indicators are, to a large extent, less than the unity (one) at the prevailing exchange rate between the CFA franc and the Naira during the study period. These results show, all things being equal, that the range of the DRCC is not very spread around the average, suggesting that it is possible to reallocate more efficiently the production factors to better orient the firms toward their comparative and complementary advantages.

Keywords: Economic incentives, Domestic resources cost coefficients (DRCC), Market price, Reference price, Comparative advantage, Complementary advantage.

JEL Classifications: D20, F12, F14.

INTRODUCTION

Domestic resource cost coefficients (DRCCs) are defined as domestic resources expressed at their reference prices, required to save a net unit of currency from export or import substitution. These indicators of effectiveness and comparative advantage are different from those of incentives based on effective protection rates (EPRs). Industrial incentives in the form of protection or subsidies can generate disproportionate costs arising from the irrational use of factors (capital and labor). A country values its activities if it allocates less domestic resources in the production of a unit of currency.

The values of the DRCCs, which reflect this fact, suggest the possibility of a more or less efficient reallocation of factors in order to better orient firms towards their comparative and competitive advantages. If the allocation of equipment and human capital, scarce in poor countries, is inefficient, productive activity must be discouraged and vice versa if it is successful. The growth of the market economy considered as more effective than the managed economy assumes the existence of institutions that reduce the uncertainty of agents and make the economy more efficient by facilitating the flow of information (North, 1990).

According to the founders of the cliometry, when the failure of these institutions leads to an increase in the transaction costs. Therefore, the division of labor does not allow, according to Grellet, the gains of specialization since the market exchanges are limited to a few essential operations. When

those operations well-function, the market economy can evolve. In this case, the DRCCs reflect an optimal allocation of factors that have guided firms towards their relative advantages.

The dysfunction of the institutions did not allow the lagging economies like those of Niger to benefit from the technological advances of the countries that have outstripped them. These economies have not been successful in the upgrading of specialty products. Their incentive policies have emerged as sources of excessive costs of domestic resources and trade distortions. This negatively affects the development of their manufacturing sectors.

The external constraint linked to the application of the law of comparative costs on which these countries do not have enough a lot of flexibility is the major challenge of the struggle for industrialization. Their increased competitive disadvantages in a system of increasing trade liberalization lead to the polarization bias of countries that creates two distinct categories: those that are competitive versus the protected ones.

Niger, a low-wage, low-technology country, is part of the group of Nations a britees sheltered nations. The protection of its industries appears as a trump to reduce its trade dependence on the markets' sacral mechanisms. Indeed, free trade has become problematic as to its real capacities to ensure an accelerated process of catching up with its chronic

backwardness with regard to industrialization. His choice for an incentive policy based on import substitution strategy was not sufficient to extract him away from industrial underdevelopment.

The DRCC provides a more comprehensive assessment of industrial productivity than EPR (effective protection rate) that measures price distortions to determine the structure of industrial incentives without addressing all aspects related to cost-competitiveness. The domestic resources cost model, which corrects this inadequacy, distinguishes between existing obstacles due to incentives and those related to international trade due to the cost of domestic factors. This model serves as a framework for the estimation and interpretation of the DRCCs of industrial units in Niger.

Thus, the question that arises is how to identify firms that are efficient or have a comparative advantage. The object of the analysis is to identify Niger's firms that are efficient or have a relative advantage revealed using the DRCC method. The approach used by this article consists first in presenting the theoretical framework of analysis, the empirical model which allows to discuss problems related to the estimation of the DRCC, and to interpret the adequacy between the facts and the results obtained.

THEORETICAL FRAMEWORK AND METHOD OF ANALYSIS

The theoretical framework and the method of analysis of the cost in domestic resources are discussed in the following sections.

The theoretical framework of analysis

An updated synthetic review of the literature is presented before showing how the DRCC is deduced from the Ricardian theory of relative advantage.

Brief succinct updated review of the literature

The existence of a tariff on imports increases the cost of production of the sector and thus influences the value added that it makes (Tower, 1992). This finding shows that nominal protection does not measure the extent of protection enjoyed by domestic producers. This depends on both the nominal protection granted to the output and the inputs, that is the effective protection. In the same token, export production units are protected by subsidies and deprotected by export taxes. The relationship between the EPR (effective protection rate) and the DRCC has been the subject of numerous studies in both industrial and agricultural fields (Greenway and Miner 1990, Scott 2007, Murat and Emin 2009 and Briones 2014).

The DRCC has an apparent resemblance to the EPR. Although these two measuring instruments are often confused in the literature, they present, however, fundamental differences in their measurement and significance (Cockburn et al., 1999). The main difference is in the use of input prices in the calculation of the DRCC (Heckman, 1974; Ruiz, 2003). These "shadow prices" (Srinivasan and Bhagwati, 1978) correct market price distortions that imperfectly reflect the economic cost to the society of employment of certain resources and the economic value of the "common good" (Tirole, 2016).

The debates which took place in the 1970s concerning the distinction between the concept of effective protection rate and the concept of internal resource cost (Balassa and Schydrowsky, 1972) reappear while taking into account market

failures (Stiglitz and Weiss, 1981, Tirole, 2016) and new theories of international trade (Helpman and Krugman, 1985, Mucchielli, 1997, Allegret and Merrer, 2012). The DRCC cannot be assimilated to effective protection only under specific conditions, particularly in the extreme case where all domestic prices for products,

intermediate goods, inputs and assets and the exchange rate are equal to their Respective reference prices. If this condition is met then the domestic value added is identical to the total domestic resource cost. The coefficient of the ratio between the reference exchange rate and the official exchange rate shall be the unit value. And the value of the DRCC is strictly equal to that of the VSE plus one (Lagos, 1999; Anderson and Masters, 2009). This hypothesis, which enshrines equality between reference and market prices, is very far from the reality of the markets. These market prices are affected by the interactions between economic agents, uncertainties, contextual diversities and information asymmetries (Akerlof, 1970, Spence, 1976, Stiglitz, 1987).

This hypothesis, which enshrines equality between reference and market prices, is far from the reality of the markets. These market prices are affected by interactions between economic agents, uncertainties, contextual diversities and informational asymmetries (Akerlof, 1970; Spence, 1976; Stiglitz, 1987). It is true that the DRCC may appear as an indicator of the effects of price distortions on the efficiency of productive activities as well as the EPR. But this assertion is true only in the event that price distortions are the sole cause of economic inefficiency. Such a hypothesis is far from realistic. There are, in fact, many factors other than prices that are at the root of various distortions. In short, the divergence between EPR and DRCC remains unchanged. The first measures jointly the price distortions of tradable while the second measures the efficiency and comparative advantage of industrial units in a given country.

The calculation of the DRCC requires the use of reference prices. These can take the form of wages, interest rates or exchange rates when it comes to rewarding factors of production in order to take account of their relative scarcity in the national economy. Indeed, the reference wage represents the economic cost of holding a job in an activity. It is heterogeneous as is the workforce operating in a largely segmented market. In poor countries, skilled labor is a relatively scarce resource. Its reference price is assimilated to the wage actually paid to the employed person. This assumption cannot be applied to unskilled labor because of the existence of a large disguised high unemployment margin.

In this case, the reference salary is lower than that shown on the payroll of employees. It is thus asymptotically close to the marginal productivity of the agricultural sector or the remuneration of the informal sector. The reference interest rate is, as a rule, estimated by the marginal productivity of capital in its various alternative uses. It is the different interest rates on the international markets that are used as an approximation of the reference interest rate because of the high mobility of capital in search of better remuneration.

THE DRCC DEDUCTION MODEL

The theoretical model

To what extent is the DRCC comparable to a comparative advantage? To demonstrate this, we were inspired by the work of Siggle et al. (1993). These authors deduced the DRCC from the fundamental principle of comparing labor costs between

two countries and two products highlighted by Ricardo (1817). It is obtained in a broader framework than that of two products, two countries and a single factor of production. To do this, we will proceed in three successive stages. First, we start from the simple Ricardian hypothesis centered on two countries, Nation and Exterior, two goods, A and B, and a single factor of production, labor. In this case, Nation has a comparative advantage in Activity A if its opportunity cost in terms of Activity B is lower than that of Outside. Labor productivity (P), which is equal to the quantity produced per unit of labor, serves as a yardstick for measuring the economic cost.

The option cost of A with respect to B is the inverse of their productivities: $\frac{P_b}{P_a}$, with P_a and P_b , respectively the productivity of A and B. The comparative advantage for Nation in terms of product A can be written: $\frac{P_b}{P_a} < \frac{P_b^*}{P_a^*}$ (I), where the asterisks (*) indicate the variables of the foreign country. The same criterion of expression (I) can be used to write the relative productivities concerning Exterior: $\frac{P_a}{P_b} > \frac{P_a^*}{P_b^*}$ (I*). Nation has a comparative advantage in A if its relative productivity in this activity is higher than in B.

Secondly, in a simple two-goods analysis framework, this implies that if Nation has a comparative advantage in the production of A, then Exterior automatically has a comparative advantage on product B. But in a context of n activities with (N > 2) and a single factor, labor, the situation becomes a little more complex. In this case, the demonstration of comparative advantage is not easy. It is complicated by the fact that the opportunity cost with respect to a second asset is not comparable to the opportunity cost with respect to a third or a fourth asset in the absence of a price system used to weight the productions of each country.

These relative prices do not always give an exact measure of the relative value of the products. They are distortions and are not necessarily equal to both the marginal utility of goods to consumers and their marginal costs to producers. Therefore, they modify the allocation of resources in a different direction from that which would result from perfect competition. For this reason, it is preferable to express comparative advantage using relative productivity and relative wage. The expression (I*) can be used, in the case of n products A, B, C, D, ..., N, to classify the activities according to their relative productivity. If the relative productivity level decreases in alphabetical order,

$$\frac{P_a}{P_a^*} > \frac{P_b}{P_b^*} > \frac{P_c}{P_c^*} > \dots > \frac{P_n}{P_n^*} \quad (II).$$

This expression shows the impossibility of attributing the relative advantage in all activities at the same time to one or other of the countries. Such a difficulty is circumvented by using the price of the labor factor (wage, w and w*) in Nation and Exterior by comparing their unit costs. For simplification reason, the two countries are supposed to use the same currency. Since the unit cost of activity A is equal to w/P_a , then Nation has the advantage of being able to sell its product A to Exterior if its cost of production is lower than that of its trading partner, hence: $\frac{w}{P_a} < \frac{w^*}{P_a^*}$ (III).

This rule is readily expressed in: $\frac{P_a}{P_a^*} > \frac{w}{w^*}$ (III.1). The expression (III.1) shows that to guarantee a relative advantage, the ratio of labor productivity ($\frac{P_a}{P_a^*}$) must be strictly higher than the ratio of wages ($\frac{w}{w^*}$) of Nation and Exterior. In this case, it is sufficient to find in the chain of relative productivities of

expression (II) those which obey the rule (III.1). The question that comes to mind is whether, under these conditions, we can still speak of comparative advantage?

If Nation increases the level of its wage rate, its comparative advantage will be lost in all activities. Now, if this situation is in conformity with the Smithian theory of absolute advantage, it contradicts the Ricardian approach to comparative advantage. For, according to Ricardo (1817), countries have an interest in specializing in productions for which labor productivity is highest and unit wages are the lowest.

Thus, in a two-goods economy A and B, one of them may be more expensive to produce in Nation than in Exterior. Although it is disadvantaged for the production of the two goods, the Nation may nevertheless have an advantage relative to the production of this good in relation to Exterior since the Exterior produces the second goods at a lower cost than the first. The comparative advantage always exists for at least one product for Nation. In all situations, Nation and Exterior are mutually winners to the exchange. Therefore, we must conclude that inequality (II) in the same way as the expression (III.1) defines the degree of competitiveness. But if wages reflect equilibrium prices then inequality (III) translates comparative advantage.

The concept of comparative advantage differs from that of competitive advantage. The difference arises from the nature of the prices used in the calculation of the cost of production. The first is identified through the reference price. The second is determined by market prices. The reference prices are unobservable as long as the market prices are visible and take center stage so that the other factors that can be the source of competitiveness but off-cost are ignored. Comparative advantage is compatible with free trade as a source of better allocation of resources. Competitive advantage is achieved through imperfect competition. This uncertain universe makes competitive trade ineffective. Indeed, market failures produce typical behaviors at the level of agents that are no less concrete and observable. If $\frac{P_a}{P_a^*} > \frac{w^r}{w^{r*}}$ (III.2), where w^r is the reference wage.

The third step is to generalize the concept of comparative advantage with several factors of production. It is simply adding to the cost of the labor factor (L) that of the capital factor (K). To simplify the expression of the total cost per unit of product, the productivity (P) is replaced by (1 / L), where L is the number of work units per unit produced. Similarly, K is defined as the number of capital units in value per unit of product. The cost of using capital is expressed as an interest rate r where r is the reference interest rate. With these modifications, the criterion of comparative advantage can be rewritten:

$$W^r + Kr^r < L^*W^{r*} + K^*r^{r*} \quad (IV).$$

At this stage, we can proceed to generalize with several countries. It is important to note that the right-hand side of inequality (III) is, in a free trade regime, equal to the international value added of foreign producers (VAW^*). This value added is expressed at the CIF price of tradable goods. It therefore reflects the best performance at the international level. But (VAW^*) is not available. It is then replaced by the international value added of the domestic product (VAW) assuming that it is close to it. This assumption holds only if the domestic producer of Nation uses the same quantities of inputs as the best producer of Exterior. Such simplification makes it possible to obtain a DRCC according to the following

expression: $\frac{LW^r + Kr^r}{VAW} < 1$ (V), which is assimilated to a comparative advantage indicator.

The model for DRCC estimation purpose

The following empirical model provides the means to calculate the DRCCs. Sampling and survey procedures will also be outlined.

Mathematical Definition and Assessment of the Concept

This is to present the mathematical expression of the concept and to provide elements of its appreciation. The DRCC is given by the expression (VI): DRCC = (Total cost of factors expressed at reference prices) / (International value added at reference price) $< e^f$ (VI). The numerator of inequality (VI) is the sum of the direct remuneration of local labor and domestic capital. Each production factor is valued at its reference price. The denominator is the international value added evaluated at the reference price. It is obtained from domestic value-added deflated by its nominal protection coefficient. Thus, formula (VI) indicates that an industrial activity is economically profitable only when its DRCC is lower than the reference exchange rate e^f . Domestic production may be for export or a substitute for imported products. Foreign exchange gains can be the result of both export and import substitution.

Many factors such as restrictive trade policy leading to an appreciation of the national currency and inflationary differences leading to monetary overvaluation or undervaluation under fixed exchange rate regimes lead to a failure to adjust the exchange rate (Ondo, 2013). An overvaluation of the exchange rate, which penalizes producers of exchangeable goods, occurs when (e^f) is greater than the unit. The adjustment consists in correcting all the values expressed at the international price of the exchangeable products by e^f .

In practice, we use the exploded formula (VII) which uses the unit as a decision criterion: $CCR = \frac{W^r L + (R^r + D) K^r}{e^r (VAW)} < 1$ (VII).

Where W remains the reference wage; L is the quantity of labor used; R remains the reference interest rate or option cost of capital; D is the depreciation rate of the capital stock; K^r is the stock of capital at the reference price; E remains the ratio between the reference exchange rate and the official exchange rate in effect; VAW is the value added to the international price.

The inequality (VII) is obtained by dividing both sides of the expression by e^f (VI). The characteristic of the DRCC is the use of quantities in terms of domestic resources. This indicator takes into account their economic cost, also known as opportunity cost or option cost. The use of benchmark prices is an indication of a purely holistic approach centered on a perspective of the entire economy.

It is possible to formulate, on the basis of the notion of internal resource cost, an implicit law that shows that the local resources of a country are used effectively in a given productive activity. It will be said that a country has a comparative advantage or is efficient if it uses fewer domestic resources in producing a unit of currency. That is, the lower the value of local resources in a currency, the stronger the comparative advantage of the country.

Mathematically, the more a country's DRCC is positive and less than the unit for a specific market activity, the better the formula (VII) above compares the domestic resource cost to the reference price in the numerator with the Value added of the domestic product (VAW) adjusted by the reference

exchange rate to the denominator. This added value contributes to the expression of the perfect standard reflecting the ideal hundred percent comparison standard. International equilibrium prices are assimilated to the prices applied on the boundary (aux prix à la frontière) used to calculate the VAW. If this was the added value of the most efficient industrial enterprise in the world, the DRCC could never be less than the unit. In practice, it holds only if domestic production is relatively efficient on a global scale because the CIF price of outputs includes transport costs. Consequently, the DRCC < 1 condition corresponds to efficient production on an international scale.

Sampling and survey procedures

The purpose is to specify the choice of industrial units and to explain the variables used in the estimation of the DRCCs of the firms sampled during the study period. In the first place, we chose the industrial units. The data were collected directly from the industrial units and the National Institute of Statistics (INS). The study aimed to cover all firms in the country. This ambition is thwarted because the data collected from some companies are unusable. We have not proceeded in the choice of manufacturing units to We have not carried out rational exclusions in the choice of industrial units. The population of nineteen (19) industrial units for the study period, which we covered, is very broadly representative of all manufacturing industries.

The choice of years 2005, 2010 and 2012 is also dictated by the availability of complete statistical information. Table 1 below shows that the contribution to manufacturing aggregates is high. These companies are concentrated on four branches in the following average proportions: Food industries (45%); Heavy Industries (22%); Chemical Industries (23%) and Textile Industries (10%).

Secondly, we explained the variables used to calculate the DRCCs. The above-expanded formula (VII) was used to calculate the DRCCs of firms. The local producer international value added (IVA) is estimated by deflating the value of domestic production (VDP) by the nominal protection coefficient ($1 + t_i$) and that of the exchangeable inputs (VEI) by ($1 + t_j$). Then, $IVA = PO / (1 + t_i) - VEI / (1 + t_j) - PO / (1 + t_i)$ is the value of domestic production deflated and, the customs duty on output i , which gives the value of production expressed at the international price. $VEI / (1 + t_j)$ is the value of exchangeable inputs deflated and t_j , the customs duty on input j , which gives the value of the traded inputs expressed at the international price.

The IVA estimate required the use of Community data from the West African Economic and Monetary Union (UEMOA), which officially became a Customs Union as of December 31, 1999. As such, it has a Common External Tariff (CET) and trade among its eight (8) members is therefore liberalized. The CET structure comprises four rates, depending on the nature of the categorized products. Overall, customs duty is 2% for Category 0, 7% for Category 1, 12% for Category 2, and 22% for Category 3.

The average tax rate is 18% %, 10.5% and 8.3% for consumer, intermediate and capital goods respectively (Cadot et al., 2013). These data were used to calculate the tariff coefficients that apply to inputs and outputs of sampled firms. The IVA was estimated on this basis. The importance of trade with Nigeria and the continued appreciation of its currency during the period of study make it necessary a priori to take into account the effects of the naira rate on the DRCCs.

Table 1: Sample weight in the manufacturing sector

	2005	2010	2012
Share in net sales	43	88,3	85,2
Share in value added	68	76	75,1
Share in payroll	56	70,4	73,4
Share of employment	48	76	64

Source: Author's calculations based on company survey data and NSI data (2005, 2010, and 2012).

Table 2: CFA franc / naira exchange rate (uncertain)

Year	2005	2010	2012
Parallel rate	3,15	2,95	3,00
Official rate	4,05	3,34	3,29
Coefficient of overvaluation (Parallel rate / official rate)	0,78	0,75	0,91

Source: -Banque Centrale des Etats de l'Afrique de l'Ouest (BEAO) for official rates
-ECOBANK, Birni N'Konni Agency, for parallel rates.
-Calculations of the author for the coefficients of overvaluation.

It is well known the CFA franc was highly demanded in Nigeria for its external purchasing power through the parallel market circuit. According to Amoussouga (1990), the parallel rate is considered to be fairly close to the equilibrium rate. Thus, the reference exchange rate is estimated using formula (VIII):

$$(e^r) = \frac{\text{taux parallèle}}{\text{taux officiel}} \quad (VIII).$$

This ratio is significant only from the point of view of the Nigerian economy where, in official transactions, the parallel market exchange rate is a reference rate.

But in the relations between both Niger and Nigeria, the exchange of currencies takes place in the informal market where the increase in the exchange rate increases the DRCCs of Niger products. Correcting those facts by (e^r) makes it possible to take better account of the effects of the naira rate on industrial incentives. Thus, at uncertainty, the coefficient of undervaluation of the CFA franc relative to the naira is 0.78; 0.75 and 0.91 respectively for the years 2005, 2010 and 2012 as shown in Table 2.

The correction of the DRCCs by the undervaluation of the exchange rate affects precisely the IVA. The adjustment effect is to amplify these indicators whose estimation is based on the calculation of the following variables:

- the reference price of the local labor force was estimated by the average income in the artisanal production sector on the assumption that the alternative to Niger is that of industrial employment or informal activities. A distinction has been made between two categories of labor with two wage rates;
- the ratio between the reference price and the market price of the expatriate labor force has been estimated on the basis of the accounting data of the companies. Indeed, a French engineer receives in Niger on average two (2) times the wage he would have received in his country;
- the wage bill is expressed at the domestic market price ($[W]^{\wedge} L$);
- the reference interest rate (R^{\wedge}) is used in the direction of the option cost of capital use. We have

thus retained the rate which applies to French treasury bills, taking into account the French nationality of the majority of foreign capital;

- the ratio between the reference exchange rate and the prevailing exchange rate (e^{\wedge}) is estimated by comparing the parallel rate with the official rate;
- the value of the capital stock at the reference price is estimated using the formula:

$$K^{\wedge} r = \alpha K / (1 + t_m) + (1 - \alpha) K \quad (IX),$$

Where,

- α is the proportion of tradable inputs in the value of the capital stock;
- K is the value of the capital stock at market price;
- t_m is the average nominal protection rate on the exchangeable inputs contained in the capital stock.

Formula (XI) above shows that the proportion of non-tradable inputs used in the capital stock is separated from the value added part and deflated by the average tariff (t_m) on tradable inputs. All calculations of the efficiency and comparative advantage indicators were performed on Excel.

THE PRESENTATION AND INTERPRETATION OF THE RESULTS OBTAINED

In order to illustrate the methodological analysis described above, this part will consist in presenting and interpreting the results obtained.

The presentation of the results obtained

The results obtained, followed by the calculation of the mean and the standard deviation, are presented in Table 3.

The interpretation of the results and the implications of industrial policy

The results obtained will be interpreted first before identifying the implications of industrial policies for Niger.

Table 3: The domestic resource cost of 2005, 2010 and 2012

Business Name	DRCC 2005	DRCC 2010	DRCC 2012
National Office of Pharmaceuticals and Chemicals	0,89	0,39	0,90
Unilever Niger SA	0,80	0,61	1,07
Milk SA	0,74	0,60	0,82
Nigerian Cement Company	0,72	0,43	0,74
Moulin du Sahel	1,39	0,40	0,86
Niger Milk Company	0,52	0,39	1,09
Nigerian Textile Company	0,96	0,95	0,77
Society of Breweries and Gazeous Beverages of Niger	0,81	0,90	1,11
Industry Niger Moss	1,01	0,86	0,61
Tannery Malam Yaro	0,96	0,41	0,70
Nigerian Foam Mattress Company	0,49	0,42	0,86
Pro Mousse SA	0,63	0,41	2,01
Niger Star SA	0,64	0,35	0,96
Mag Niger	0,63	0,40	0,65
Latex Foam Rubber Products SA	0,58	0,48	1,02
Duraplast	0,50	0,61	0,60
Food Processing Corporation	0,84	0,92	0,68
Niger Asie	0,72	0,40	0,71
Laban Niger	0,98	0,81	0,74
Average	0,78	0,57	0,89
Standard deviation	0,22	0,21	0,32

Sources: Author's calculations based on company survey data and INS data (2005, 2010 and 2012).

Compliance of the assumptions and limitations associated with the DRCCs

After interpreting the results obtained, it will be proposed an incentive policy to be implemented by the Government of Niger.

Compliance of the retained assumptions to the facts

Economic profitability is understood here in terms of the comparative advantage of a given industrial unit within the national economy. The DRCCs provide an indication of the trend in the cost structure of firms' inputs. On the whole, their values would tend to temper the pessimism prevailing at all levels on the future of Niger's industry.

Thus, the hypothesis concerning the selection of firms by the DRCC technique, even if it does not lead to relevant conclusions, has the merit, in a decentralized system of price, to provide information that can guide the resources' allocation toward their relative and competitive advantages. In other words, the DRCCs make it possible to select promising activities and to eliminate those that are not.

Information on inefficient firms shows the directions to avoid. When the DRCC is negative or higher than the unit, the cost incurred to earn a unit of currency exceeds the gain realized at the prevailing exchange rate. The productive activity in question is not economically viable and should be discouraged. On the contrary, if the DRCC is less than unity, the activity considered is efficient. If on the other hand, the DRCC is equal to one, the company does not earn or lose foreign currency; it reaches the break-even point.

The Niger market is the main market for the nineteen (19) companies sampled. Table 3 shows that DRCCs are positive, less, close to or greater than unity at the exchange rate prevailing on the Naira parallel market. In 2005, these DRCCs are all lower than the unit except for two (2) companies. The DRCCs of all firms have values of less than one in 2010. On

the other hand, in 2012, fourteen (14) companies had DRCCs with value less than one.

One (1) firm has a DRCC close to one and those of the other four exceed the unit. These results, which are essentially dependent on resource availability, productivity and production costs, provide, all other things being equal, indications of the effectiveness of an increase in the rate of utilization of firms' productive capacity.

The analysis of these results reveals that the DRCCs range is not very dispersed around the average over the study period. Such dispersion seems to indicate the possibility of a more efficient reallocation of resources.

On average, the 2005 DRCC is 0.78, thus expressing the efficiency for the enterprises considered with a standard deviation of 0.22. This gives the ceiling (1.00) and the floor (0.56) between which the DRCCs vary. This shows that at international prices, Niger more effectively uses the resources devoted to the production of goods. In other words, the distortion costs associated with public policies, the incentive system and the exchange rate between the CFA franc and the Naira generate economic gains for the country.

Dynamic analysis shows that the business situation compared to 2005 improved significantly in 2010 before deteriorating in 2012. Such instability is inherent in the nature and characteristics of firms operating in the Niger economy held by traps with low industrial development. Overall, the investments appear to be oriented towards niches that provide a higher return on the value of assets. Under these conditions, companies are able to generate economic surpluses for the national economy.

Limits associated with DRCCs

The picture of these firms reflected by the DRCCs must be carefully considered. Industries oriented towards the Niger market hold a monopolistic or oligopolistic position. Despite the relative efficiency, these firms are oversized. Moreover, their

relative performance is influenced by in appropriate incentive policies. Profits from the income of Niger's consumers are entirely pocketed by shareholders. Entrepreneurs develop as strong a version to risk and are rarely inclined to engage in the Schumpeterian process of creative destruction. This process that triggers change is based on innovation. Monopolists are far from expanding entrepreneurship and expanding supply to reduce prices for consumers. To succeed in a competitive world, entrepreneurs must innovate. These Chesson computing entrepreneurs must turn into Schumpeter's entrepreneurial innovators who advance the technological frontier. The added value lies in innovation.

Protected Niger producers devote their efforts to obtaining the internal rent. They do not seek to open up to foreign competition. The absence of an outward-oriented policy is at the root of the inertia of the manufacturing sector. Anti-export bias has confined the latter to a passive role. They prevented foreign exchange gains through exports. Indeed, only the currencies saved by the import substitution are used. This restrictive option is the opposite of that used by industrial Asia. It has been able to allocate its resources efficiently through an appropriate incentive structure.

It has made use of temporary tariff protection to ensure that some of the exporting industries have a protected local market while developing sales networks abroad. These measures have helped to minimize price distortions in product and factor markets. The skillful dosage of protections has been the guarantee against the inefficient use of scarce resources. The flexibility of such a policy has allowed for specialization gains. Thus, the Asian economies have been industrially transformed through the diversified production of manufactured goods destined for export.

This trajectory corresponds to the orientation of the firms according to their comparative and competitive advantages. Industrial Asia has succeeded in controlling the role of the substitution to import. Domestic demand was the main determinant of its sustained growth. Protected Niger producers devote their efforts to obtaining the internal rent. They do not seek to open up to external competition. The absence of an outward-oriented policy is at the root of the inertia of the manufacturing sector. Anti-export bias has confined the latter to a passive role. They prevented foreign exchange gains through exports. Indeed, only the currencies saved by the import substitution are used.

This restrictive option is the opposite of that used by industrial Asia. It has been able to allocate its resources efficiently through an appropriate incentive structure. It has made use of temporary tariff protection to ensure that certain exporting industries have a protected local market while developing sales networks abroad. These measures have helped to minimize price distortions in product and factor markets. The skillful dosage of protections has been the guarantee against the inefficient use of scarce resources.

The flexibility of such a policy has allowed for specialization gains. Thus, the Asian economies have been industrially transformed through the diversified production of manufactured goods destined for export. This trajectory corresponds to the orientation of the firms according to their comparative and competitive advantages. Industrial Asia has succeeded in controlling the role of import substitution. Domestic demand was the main determinant of its sustained growth.

POLICY IMPLICATIONS

For the Niger economy, whose industrial activities are not constrained by a foreign exchange constraint due to its

membership in the franc area, the acquisition of external market share is paramount in relation to the objective of saving currency. However, the Asian trajectory was not followed by Niger. The theoretical breakthroughs validated by empirical tests of Niger DRCCs suggest to regulate the market and to manage industrial units differently in the image of Asian countries. They have successfully pursued a two-fold competition policy: protection of sectors which are insufficiently equipped to face international competition and the promotion of branches that are known to be able to keep up with foreign competitors in terms of exports.

Public intervention has been crucial to the success of this strategy. The State intervened either to help companies' access bank loans or to restrict import competition, or to limit the entry of new competitors into the domestic market or to set up institutional mechanisms for the sale of the products of branches capable of supporting foreign competition. Such a policy has enabled industrial Asia to adapt to a changing international environment by giving it two major advantages: the instantaneous absorption capacity of exogenous shocks and the rapid change in the competitive and comparative advantages of firms.

The efficiency of firms and their competitive advantages stem from rapid changes in specialization. Indeed, once a branch is no longer competitive, the State encourages the companies concerned to change segments. Trade agreements have allowed the optimization of production lines. Over the past two decades, these Asian countries have initially embarked on a downward course of unilateral tariff cuts before negotiating their preferential trade agreements with Japan, Attracting direct investment (Grether and Melo, 2013). This allowed the establishment of the Asia factory.

This experience deserves to be tested in Niger. It will allow, through the optimal regulatory and competition management mechanisms, Nigerian decision-makers to better guide their actions in order to model structures, adapt methods, evolve the entrepreneurial culture by the emergence of animal spirits. Such structural changes can be the sources of new wealth creation. They can favor the concordance between the competitive and comparative advantages of firms whose products manufactured under satisfactory conditions of efficiency will create technological proximity. Their price and cost competitiveness will be expressed in terms of lower production, transport and transaction costs. Their profitability stimulated by the innovations will increase with the reliability of the means of communications and the reduction of the depreciation time of the installed equipments.

CONCLUSION

The DRCCs evaluate the relative benefit and effectiveness of an activity at a point in time. Their values show how to make more efficient use of the necessarily limited resources of a country. These instruments can address the concerns of companies and decision-makers in economically weak countries such as Niger in fields as diverse as agriculture and industry. The DRCC technique, however, is not the focus of professional economists who advise governments in their choice of investment projects and in the decision-making process in planning.

However, these tools show that market forces can lead to specialization according to the comparative or competitive advantage of industries even if the structure of industrial incentives that cause price distortions, information asymmetry and market imperfections can thwart this trend. The DRCCs are at the heart of the controversial economic debate on the

regulation and competition of protected or exposed firms. They draw attention to price distortions in the administered economy as well as the harm and benefits of competition. However, the rigorous analyses they generate are extremely rare, especially in countries with an unfinished industrial structure.

This study of the Niger case, despite its limitations, can help make progress towards a greater use of the DRCCs. It has the merit of showing that the saving of foreign exchange resulting from the substitution for importation is not enough to infuse a new dynamic to the protected manufacturing sector of Niger. The competitiveness of firms is being challenged by their retreat through the adoption of two-pronged policies inspired by the Asian experience: protection of industries with insufficient means to face international competition and promotion of sectors capable of competing in terms of export.

REFERENCES

- Abdul G, Ismail B, Gharleghi Y. J, Ehsan H et Najla S (2010), The Impact of Domestic Resource Cost on the Comparative Advantages of Iran Crude Steel Sector, CARP Paper n° 26381, November.
- Allegret, J-P et Le Merrer, P. (2012), Economie de la mondialisation. Opportunités et fractures, De Boeck.
- Akerlof, G. (1970), The market for lemons: quality uncertainty and the market mechanism, *Quarterly Journal of Economics*, Vol.84, n° 3, p. 488 - 500.
- Amoussouga, Fulbert G. (1990), Les marchés parallèles de change autour de la Zone Franc: le cas du Naira contre FCFA. *Revue Techniques Financières et Développement*. Vol.21, p.34-40.
- Anderson, K. and Masters, W. A. (2009), Distortions to Agricultural Incentives in Africa, World Washington, DC.
- Balassa, B. and Schydrowsky, D. (1972), Domestic Resource Costs and Effective Protection Once Again, *Journal of Political Economy*, Vol. 80, n° 1, p. 63-69.
- Boubaker, D. (2009), Impact des ressources domestiques : coûts sur la compétitivité des tunisiens de fruits frais et de produits végétaux, exportations, énergie, le changement climatique et le développement durable, Hammamet, Tunisie.
- Briones, R. M. (2014.), Estimates of Domestic Resource Cost in Philippines Agriculture., World Bank, Washington, DC.
- Bruno, M. (1965), Le choix optimum des projets de développement des exportations et de remplacement des importations, dans Plannig the ExternalSector : Techniques,Problems and policies , New York , United Nation.
- Cadot, O., Chambas, G., Geourjon, A.M., .De Quatrebarbes, C. et Laporte, B. (2013), Intégration commerciale et harmonisation, in Intégration régional pour le développement en Zone franc, sous la direction d'Anne-Marie Geourjon.
- Cockburn, J., Siggel, E., Coulibaly, M. et Vezina, S. (1999), Compétitivité et ses sources de mesure: Le cas du secteur manufacturier du Mali, *Canadian Journal of Development Studies*, vol. 20, p. 491-519.
- Collier, P. et Venables, J.A. (2007), Rethinking Trade Preferences: How can Africa diversify its exports, *The World Economy*?
- Fogel, R W. (1964), Railroads and American Economic Growth : Essays in EconometricHistory.
- Greenway, D. et Miner, C. (1990), Industrial incentives, domestic resource costs and resource allocation in Madagascar, *Applied Economics*, Vol.22, p.805 - 821.
- Grellet, G (2016), L'économie de l'Afrique Sub-saharienne (à paraître).
- Grether, J. M, De Melo, J. (2013), La montée en puissance du régionalisme et l'avenir de l'OMC, document de travail, Ferdi, Clermont-Ferrand.
- Heckman, J. (1974), Shadow Prices, Market Wages, and Labor Supply, *Econometrica*, Vol. 42, n° 4, p. 679 - 694
- Helpman, E. and Krugman, P. (1985), Market Structure and Foreign Trade, The MIT Press, Cambridge Mass.
- Hugon, P. (2000), L'analyse économique des filières agricoles en Afrique sub-saharienne, Ministère français des affaires étrangères.
- Hugon, P. (2010), L'économie de l'Afrique, La Découverte, Paris, Coll. « Repères ».
- Krueger, A. (1966), Some Economic Costs of Exchange Control: the Turkish Case, *Journal of Political Economy*, Vo. 1 74, October, p.466 - 480.
- Laborde, D. (2012), La protection commerciale dans le monde, La Lettre du Centre d'Etudes Prospectives et d'Informations Internationales (CEPII), n° 323.
- Lagos, GE (1999), Développer l'approche du coût en ressources domestiques pour identifier les impacts économiques et environnementaux du commerce: le secteur minier au Chili. Santiago, Université catholique du Chili.
- Mucchielli, J.-L. (1997), Economie internationale, Paris, Dalloz.
- Murat, Y. et Emin, I. (2009), Domestic resource cost approach for international competitiveness of Turkish horticultural products, *African Journal of Agricultural Research*, Vol. 4 , n° 9, pp. 864 - 869.
- North, D. C. (1990), Institutions, Institutional Change, and Economic Performance, Cambridge University Press, Cambridge.
- Ondo, A. O. (2013), Taux de change d'équilibre et politique économique en zone franc africaine, *Revue d'Economie Appliquée*, Vol.1, n° 1, p 3-24, Juin-Juillet, Libreville Gabon.
- Ricardo, D. (1817), Principes de l'économie politique et de l'impôt, Calmann-Lévy, Paris, 1970.
- Ruiz, EM. (2003), La politique autarcique et l'efficacité dans le secteur industriel espagnol. Une estimation du coût des ressources domestiques, Document de travail 77/03, London School of Economics.
- Scott R. (2007), Net social profitability, domestic resource costs, and effective rate of protection, Published online, 23 November, p.320 - 333. www.tandfonline.com > List of Issues > Table of Contents.
- Siggel, E., Cockburn, J. et Danserau, P. (1993), Calcul et interprétation des indicateurs d'incitations économiques et d'avantage comparatif, Réseau de Recherche sur les Politiques Industrielles en Afrique, CODERIA-Dakar.
- Spence, M. (1976), Informational aspects of market structure: An introduction, *Quarterly Journal of Economics*, Vol. 90, n°4, p. 591-597.
- Srinivasan, T. and Bhagwati, J. (1978), Shadow Prices for Project Selection in the Presence of Distortions: Effective Rates of Protection and Domestic Resource Costs, *Journal of Political Economy*, Vol. 86, n° 1, p. 97-116.
- Stiglitz, G. and Weiss, A. (1981), Credit Rationing in Market with Imperfect Information, *The American Economic Review*, n° 3, p.393- 410.
- Stiglitz, J. (1987), The Causes and Consequences of the Dependence of Quality on Price, *Journal of Economic Literature*, Vol.25, p. 1- 48.
- Tirole, J. (2016), Economie du Bien Commun, Paris, Presses Universitaires de France (PUF).
- Touhami, A., Hakim, J., Oumansour, M. et Berja, F.(2011), Estimation et interprétation des indicateurs de protection, d'incitation et d'efficacité économique de l'économie marocaine, Banque Mondiale, Washington, DC.
- Tower, E (1992), Domestic Resource Cost, *Journal of International Economic Integration* Vol. 7, n° 1, p. 20 - 44.