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# Study on the Impact of Export and Import on Economic Growth in Iran

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## ABSTRACT

This paper investigated VAR method between import, export and economic growth in Iran over the period 1962-2011.The role of the import and export variables in the investigation of economic growth output cointegration analysis is emphasized, enabling one to test for the cases direct long run relationship, indirect long run relationship, and impulse, response function between export and import and economic growth. The empirical results did confirm a long run relationship between the variables considered. Based on results, export had direct and positive relationship with economic growth in long run. Also import had a significant and negative relationship with economic growth then import had negative effect on economic growth in long-term. We also saw a shock on the export has had a positive effect on economic growth; the other hand a shock on import error term had not much effect on economic growth so a shock on import could not positive effect on economic growth.
**KEYWORDS:** Import, Export, Economic growth, Vector Autoregressive, Cointegration analysis, Iran

## 1. INTRODUCTION

Many economists believe that export or import provides the promotion capabilities & the increasing of productivity growth; so more competition in import lead to more efficiency of corporations & giving reward to efficient domestic corporations due to benefiting from the more share of market causes the increasing of corporations' efficiency. Also the increasing of import due to the possibility of using the new technical information by exporting corporation improved the efficiency of these corporations (Hwang & Aw, 1995).

Also in modern economy the degree of a country's development has direct relationship with the volume of that country's international business relations. So the export development & gain the exchange resources are the most important goals of countries' economic policymakers. With using of export countries can increase the production rate and employment through excitation of domestic production also they can provide the required exchange resources in order to increase the import and domestic consumption that cause the increasing of economic welfare (Nazemi, 2010).

Economic theories about the growth can be review through three sections such as Adam Smith, New classical, New Growth Theories.

Adam Smith: He was aware of trade and growth's mutual benefits also their relation to geography: "although the wealth of neighboring countries is dangerous of war and politics aspect but from trade aspect it is certainly an advantage. A nation that all its neighbors are poor and, unaware and far from civilization can gain the wealth trough cultivation of their land and domestic trade not foreign trade but a country that all its neighbors be rich & industrial will enter in international trade with more probability. Smith believes that foreign trade will increase the growth.

From half of the twentieth century Harrod-Domar presented whatever about the growth that was theorizing in the past 200 years with simple equations and formal form. Based on Harrod-Domar pattern the economic growth depends on three factors:

1. Saving rate that is determined by families at the time of revenue sharing between the consumption and saving.
2. The proportion of capital to produce which is the reflector of a manner to establishment the demand for capital with considering to production amount.
3. Depreciation rate that somewhat is causing of decision quality about the investment in the past.

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So whatever that Adam Smith and his followers had been expressed was presented by Harrod-Domar in a form of simple equation & because of that growth is depends on savings and efficiency also is depends on depreciation. Nevertheless, this theory was criticized from two aspects: The first one is about the circumstance of families' decision about the choosing between consumption and savings & the second one the circumstance of capital adjustment to produce by corporation.

In the decades of 50 and 60 some models were developed that now are remembering of them as neoclassical growth models. Based on mentioned models, the increasing of investment was the best way to increase the production level & the most important factor for determining the difference between income levels is capital factor in these countries. Robert M. Solow (1956) & Cass D. (1965), are as economists that proposed these models.
In this pattern product Y is produced through Cobb-Douglas production function by labor and capital with fixed return in proportion to scale.

$$Y = L^{\alpha}K^{1-\alpha} \qquad (1)$$

New Growth Theories Models: Many economists expressed their dissatisfaction of neoclassical growth model inability in answering to some important questions about economic growth in the 1980s.Some doubts were created about the reasonableness of this assumption that technology advances is exogenous in economic aspect. Also a group of economists were dissatisfied of long-term economic growth exogenous assumption in the neoclassical model and believe that if the per capita production only depends on technological progress rate , grows and the growth rate is equal to it so why the growth performance are difference as considerable form in different countries in long term?

In Robert Lucas's endogenous growth model (1988), human capital and physical capital is differentiated from each other explicitly. The general way in this model is like previous work in this way that physical and human capital are produced by different technologies .So briefly we can say that theory of economic growth is broad and deep that as economy is oldness. Classical economists from Adam Smith at least to Marshall, were considered the economic growth as endogenous with this concept that depends on economic factors, particularly savings, efficiency and depreciation. This comment about growth was summarized in a simple equation by Harrod-Domar until Robert M. Solow(1956) offer a new pattern and show that economic growth is exogenous in the long term wonderfully so is independent from savings, efficiency and depreciation and there is not any relation between economic policies and long-term growth. But finally the economic theorists again were studied on confirmation of endogenous growth also the relationship between savings; efficiency and growth then were presented new works.

Trade liberalization and Economic Growth: Export is a tool for producing & exchange flow to domestic economy that this exchange will provide the financial needs related to the import (Thirlwall, 1980).

Therefore tendency to foreign countries , might through utilization of economic scales & the subsequent learning of international contracts provide the more efficiency of corporation (World Bank ,1993).So there are another view that lead the causality and direction relation of economic growth toward trade flows (Caves,1971). In the special case, there is this claim that economic growth, increasing of skills and technology which are important in the creation of comparative advantage at the international level and consequently trade development (Krugman 1984).

Some economists like Renelt & Levine (1992), believe that long term relationship between export and economic growth of resources quick's accumulation is based on export development strategies in these economies.

## 2. MATERIALS AND METHODS

Filiztekin, A (2000), he studies on the test of relationship between trade policy & growth in Turkey industry for the period 1996-1970. The results show that five industries which are in first rank because of value-added in the beginning of period (1980-1970) had lower growth. Based on his results after liberation, evidence showed the lower growth of import but all industries have been faced with increasing of export that from the aspect of dollar's value, this increasing share in leather industry and electrical machinery has been more than the other industry.

Tehranchian, Amir Mansour (2002), in his research be studied on export effect on Iran's economic growth. This study shows that during the 30-year period of investigation, the non-oil export is formed averagely just 5.7 percent of total export and 1.6 percent of country GDP. While the oil exports to 1996 is allocated more than 90 percent of GDP to itself. Also the results of econometrics models estimation show the no stretch of economic growth than to growth of total export and oil export also not significant of economic growth**'s** stretching coefficient in proportion to non-oil export growth.

Tofighi Hamid(2003), in a research with this subject " The impact of export on economic growth in Iran with emphasis on technical and engineering services export found that non-oil export and the exporting of technical and

engineering services has positive impact on economic growth. In addition, in this paper the circumstance of various shocks effects on economic growth in overtime and the rate of variables changes on economic growth with the variance decomposition have been considered.

Atrkar roshan Sedigheh (2008), with the subject of export expansion and economic growth, evidence of Iran after the revolution period found that in both stages she confirmed the positive relationship of export expansion and economic growth in Iran for the period after the revolution.

Tehranchian, Amir Mansour (2009), with this subject "The effect of import on Iran's economic growth" was studied on the effect of capital goods' import, indirectly or consumption on growth. Investigation of import process showed that in the studied period despite the increasing of import all three groups of these goods, combination of imported goods especially after the implementation of development programs has changed in favor of intermediary goods and capital. Also based on offering econometrics model the stretching coefficients of economic growth in proportion to import of capital goods and intermediary are 0.06 and in proportion to imports of consumption goods are estimated -0.22 this state the direct effect of capital goods import and intermediary, indirect effect and reducing the import of consumption goods on economic growth indicator in Iran.

Murat Çetinkaya and Savas Erdogan (2010), In the study, using the figures of import-export belonging to the periods 2002:01 – 2010:03 of Turkey, VAR Analysis was carried out. In this period, it was determined that there was causality relationship between these variables, the variable import influenced GDP, and GDP influenced the variable export. Between export and import, two way Causality relationships released mutually. In the same way, the results of causality overlap with variance decomposition test.

Maleki, Amin(2011), he with this subject " the effect of export technological composition on economic growth" concluded that the estimation of time series model with two techniques at least simple normal squares and augmented confirmed the hypothesis of efficiency differentiation in utilization of production factors, in sectors of technology export also believes that technology sectors on non-oil export has more effect on growth specially are emphasized on industry's role with low technology in country's economic growth.

Barbara Pistoresi and Alberto Rinaldi (2011), the nexus between trade and economic growth in Italy has been widely debated by historiography. However, there are not long run analyses on this topic that cover the whole span from Unification to present days. This paper contributes to fill this gap by investigating the relationship between real exports, imports and GDP in Italy from 1863 to 2004 by using cointegration analysis and causality tests. The outcome suggests that these variables commove in the long run but the direction of causality varies across time. In the period prior to the First World War import growth led GDP growth that in turn led export growth. Conversely, in the post-Second World War period we have a strong bidirectionality between imports and exports consequent on the increase in intra-industry trade. They also find a weak support for export-led growth and growth-led imports. This suggests that exports were not the only or the main driver of economic growth. There was probably a multiplicity of factors at work, among which high rates of capital formation and the expansion of internal demand probably stood out.

So can be concluded, generally trade liberalization or generally trade reforms have different effects on the industry according to the structure of studied country; Totally about the causality relationship between economic growth and export growth the existing literature and empirical evidence never could not state a clear causality relation. Some studies are expressed a unilateral relationship & others a mutual relationship. In the present research the understanding of export and import effects on economic growth in Iran is the main goal, how and through what channels the foreign trading system can effect on growth and sustainable development.

## 3. RESULT

In this paper for analysis, the vector autoregressive pattern is selected which is suitable analytical model for analytical pattern in this research. After reviewing of previous studies the pattern of Murat Cetinkaya and Savas Erdogan (2010), Barbara Pistoresi and Alberto Rinaldi (2011) were chosen as the base model. The mentioned papers with this subject **"**Export, Import, and Economic growth "respectively in Turkey and Italy countries with using of causality method and cointegration analysis were studied on relationship between export, import & economic growth in mentioned countries.

So the logarithmic model which will be tested in this study are as follows:

$$LOG(G) = f(LOG(EX), LOG(IM)) \quad (2)$$

In the above statement G: Economic growth, EX: Total export and IM: Total import

### 3.1.The unit root test of Augmented Dickey Fuller

In this part the augmented Dickey-fuller test is done for mentioned variables which results have been reported briefly in Table 1.

Table1: The results of the unit root test of augmented Dickey-fuller for the model's time series data

| Series Name | Statistics of augmented Dickey-fuller in level | Statistics of augmented Dickey-fuller with first diffrence | critical values of MacKinnon | | | prob | Explanations |
|---|---|---|---|---|---|---|---|
| | | | 10% | 5% | 1% | | |
| **LNG** | 2.09 | -3.00 | -1.61 | -1.94 | -2.61 | 0.0034 | With first difference became static |
| **LNEX** | 1.49 | -5.40 | -1.61 | -1.94 | -2.61 | 0.0000 | With first difference became static |
| **LNIM** | 2.26 | -5.91 | -1.61 | -1.94 | -2.61 | 0.0000 | With first difference became static |

Source: software output

As seen from table the three variables of economic growth, export and import was not in static level & with first difference became static.

### 3.2. Length determination of model's optimal Lag

After selecting the used variables in model & static test then the length determination of optimal lag is an important issue in VAR model. In this paper is used of AIC, LR, FPE criterions for length determination of optimal lag**.** The obtained results for the length determination of optimal lag is shown in the below table. So the length of optimal lag is 4.

### 3.3. The model's stability test

For proving of model's stability none roots should not be outside the circle. As seen in the below chart one of the roots almost is on the circle & the others are inside the circle. So the estimated model was convergent and has necessary stability.

### 3.4. Johansson's cointegration test

Johansson's cointegration test for all variables of economic growth, export and import that all are I(1) which are reported in table 2.

Table 2: Johansson's cointegration test

| **Trace test** | | | | |
|---|---|---|---|---|
| **Hypothesized No. of CE(s)** | Critical Value 0.05 | Trace Statistic | Eigenvalue | Prob.** |
| **None *** | 24.27 | 44.67 | 0.55 | 0 |
| **At most 1** | 12.32 | 7.23 | 0.14 | 0.3 |
| **At most 2** | 4.12 | 0.03 | 0 | 0.87 |
| **The maximum eign value** | | | | |
| **Hypothesized No. of CE(s)** | Critical Value 0.05 | Max-Eigen Statistic | Eigenvalue | Prob.** |
| **None *** | 17.79 | 37.43 | 0.55 | 0 |
| **At most 1** | 11.22 | 7.19 | 0.14 | 0.23 |
| **At most 2** | 4.12 | 0.03 | 0 | 0.87 |

Source: software output

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

As seen in table 2 based on both the maximum Eigenvalue & trace test there is a cointegration vector between the variables of this model, in other words there is a linear combination of variables which the static was grade A. So with assurances of about the not existing of false regression can use of all variables as level.

### 3.5. The estimation of error correction model

After model estimating as vector error correction method the results are as follows.

Table3: The result of vector error correction model estimation

| Cointegrating Eq | CointEq1 | Standard errors | t-statistics |
|---|---|---|---|
| LNG(-1) | 1.00 | - | - |
| LNIM(-1) | -0.12 | 0.07 | 1.65 |
| LNEX(-1) | 1.31 | 0.07 | -16.43 |
| Adjustment coefficient (ECM) | -0.15 | 0.02 | -5.33 |

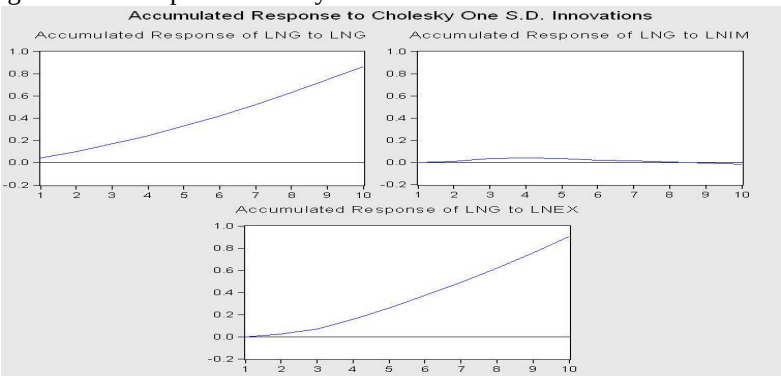
Source: software output

As seen in table 3 the adjustment coefficient (ECM) is significant and its amount is 0.15 means that 15 percent of deviations and volatilities is adjusted toward the long-term balance in the first year.

### 3.6. Impulse, response function

In this part dynamic response of economic growth variables (LNG) because of shock effect in the other model variables & based on cholesky analysis for next 10 periods is shown in figure 1. As can be seen a shock on export error term has positive effect on economic growth but a shock on import error term has not much effects on economic growth.

Figure1: The Response of every variable to the shocks from other variables.




Source: software output

### 3.7. Variance Decomposition

In the below table is shown the analysis of variance for economic growth. Export variable in the second period is expressed the 9.43 % of economic growth changes but this amount has increased over time & in long term reach to 56.03% that this variable has highest share in explaining of economic growth changes and import in the second period is expressed the 1.28% of economic growth volatilities and this amount increased to fifth period but then decreased so in the tenth comes to 0.67%.So import is not an important factor in determining the volatility (changes) of Iran's economic growth.

Table4: Variance Decomposition of economic growth

| Period | Standard deviation | LNG | LNIM | LNEX |
|---|---|---|---|---|
| 1 | 0.04 | 100.00 | 0.00 | 0.00 |
| 2 | 0.07 | 89.27 | 1.28 | 9.43 |
| 3 | 0.11 | 74.92 | 4.87 | 20.20 |
| 4 | 0.16 | 58.32 | 2.58 | 39.09 |
| 5 | 0.20 | 51.27 | 1.62 | 47.09 |
| 6 | 0.25 | 47.19 | 1.30 | 51.50 |
| 7 | 0.29 | 46.25 | 1.04 | 52.70 |
| 8 | 0.34 | 45.24 | 0.86 | 53.89 |
| 9 | 0.38 | 44.46 | 0.72 | 54.80 |
| 10 | 0.43 | 43.28 | 0.67 | 56.3 |

Source: software output

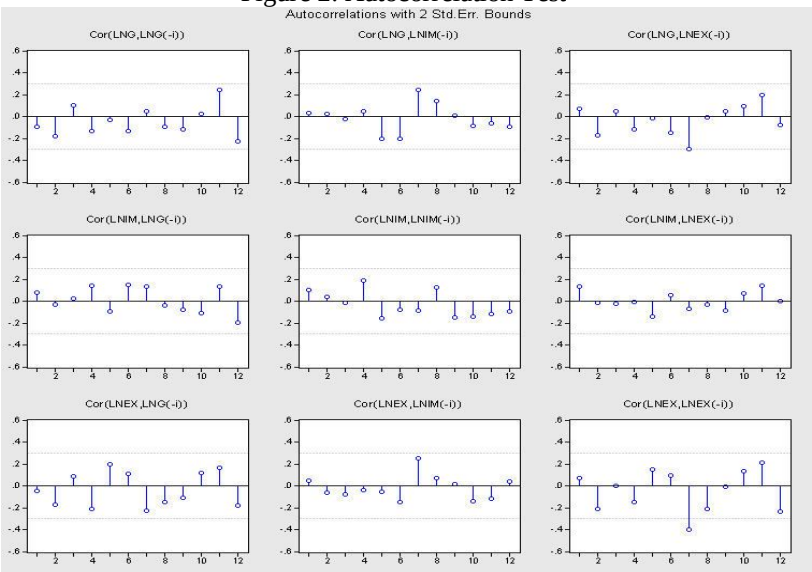
### 3.8. Residual Test

Like any other regression model after estimation should ensure that remainders to be distributed randomly, if not and the systematic form be seen in them is indicated the model's problem & should fix it (Teymoor Mohammadi, 2011).

#### 3.8.1. Chart of correlation coefficients

As you can see in figure 2 more than 95 percent of coefficients are located between the lines deviations of standard. Consequently the model does not have any problem from the aspect of equations remainder's correlation (Teymoor Mohammadi, 2011).

Figure 2: Autocorrelation Test




Source: software output

#### 3.8.2. LM Autocorrelation Test

As seen in table 5 the Prob amounts is above 5 percent & the LM-Stat amount is small ,consequently model is with no problem & there is not autocorrelation in its model.

Table5: LM Autocorrelation Test

| Lags | LM Statistics | probability |
|---|---|---|
| 1 | 14.22 | 0.11 |
| 2 | 13.73 | 0.13 |
| 3 | 8.11 | 0.52 |
| 4 | 6.37 | 0.70 |

Source: software output

#### 3.8.3. Normality Test

As is indicated in table 8 all probes are above 5 percent & J-B elements are small so can be concluded that the distribution of error terms are almost normal.

Table 6: Normality Test

| Component | Jarque-Bera | df | Prob. |
|---|---|---|---|
| 1 | 1.39 | 2 | 0.49 |
| 2 | 3.20 | 2 | 0.20 |
| 3 | 4.10 | 2 | 0.12 |
| Joint | 8.70 | 6 | 0.19 |

Source: software output

### 3.8.4. Covariance Matrix

In fact Covariance Matrix shows the Covariance of VAR model's error term. As seen in table 7 the elements that are outside the main diameter are zero consequently there is not simultaneous relationship between the variables and any manner of variables in impulse, response function shows the dynamics of system.

Table7: Covariance Matrix

| | LNG | LNIM | LNEX |
|---|---|---|---|
| LNG | 0.0017 | 0.0012 | 0.0045 |
| LNIM | 0.0012 | 0.0496 | 0.0009 |
| LNEX | 0.0045 | 0.0009 | 0.0229 |

Source: software output

## 4. DISCUSSION

Indeed, this is an area where the new research has been used in practice and has influenced public debate. However, while intending to arrive at a tractable framework allowing us to define a testable hypothesis about the configuration of the relationships between economic growth and international trade liberalization, the models are generally limited to the consideration of a single external factor. In this research, we overcome that shortcoming by introducing a multiple framework to analyze the long run relationships. Among output growth, export growth and import growth. The consideration of a long period always raises the issue of the stability of the relationships among the variables. An interesting extension of this research would be to verify whether the main characteristics of the path of the Iran economy. Did not suffer radical changes during the referred period and what implications those eventual changes could have in the cointegration test found for all the period.

In the study, VAR Analysis was applied between the variables of annual economic growth, import, and export belonging to the periods 1962-2011 of Iran Economy. The variables, taking their logarithms in Billion dollars, were subjected to the operation. Firstly, on the reason for that the variables contain the analysis of time series, whether or not they contain unit root are studied. According to this, it was determined that the variables contain unit root in their simple values and therefore, they were made stable by taking their first differences.

According to final results of research can be expressed that 4 the length lag was proposed as the optimal lag length for the model and according to both maximum Eigenvalue & Trace test, there is an cointegration vector between the variables of this model, in other words there is a linear combination of variables which static was of grade A. Also the export variable explains the 9.43% of economic growth changes in the second period but this amount has increased over time and in long term reach to 56.03% which this variable has the biggest share in explanation of economic growth. Also import explains the 1.28% of economic growth volatilities so this amount increased up to fifth period but after that decreased and reaches to 0.67% in tenth. So import is not an important factor in explaining the volatility (changes) in Iran's economic growth.

As we saw a shock on the export has had a positive effect on economic growth, the other hand a shock on import error term has not much effect on economic growth so a shock on import cannot has positive effect on economic growth. On the other hand, we observed that export has direct & significant relation with economic growth in long term also import has significant & inverse relationship with economic growth, so import has negative effect on economic growth in long term.

When regarding to these results, it is implied that the export increases as the country grows and the import indicates a decrease economic growth. When regarding to the data used in the study, they indicate a difference proportionally, it is seen that the increases or decreases in the import, export, and GDP always occur in the same period. This case indicates that the relationships between three variables are very strict.

## REFERENCES

1. Atrkar roshan, S., 2008. Export expansion and economic growth, evidences of Iran after the revolution period: Journal of Social and Human Sciences.,26: 111.
2. Aw, B.Y., and A. R. Hwang, 1995. Productivity and the Export market, A Firm-Level Analysis: Journal of Development Economics., 47(2): 313-332.

3. Cass, D.,1965. Optimum Growth in an Aggregative Model of Capital Accucnalation: Review of Economic Studies., 32: 223-240.
4. Cetinkaya, M. and S. Erdogan, 2010. Var Analysis of the Relation between GDP, Import and Export: International Research Journal of Finance and Economics., 55.
5. Krugman, P. R., 1984. Import Protection as Export Promotion: International competition in the Presence of Oligopoly and Economies of Scale, in Henryk Kierzkowski, ed., Monopolistic Competition in International Trade, Oxford: Oxford University Press: 180-193.
6. Filiztekin, A, (2000), "Openness and productivity Growth in Turkish manufacturing. Yale University (Australia).
7. Levine, R. and D. Renelt, 1992. A Sensitivity Analysis of Cross-Country Growth Regressions: American Economic Review., 82(4): 942–963.
8. Lucas, Robert E., 1988. On the Mechanics of Economic Development: Journal of Monetary Economics., 22: 3–42.
9. Maleki, A., 2011. The effect of export technological composition on economic growth: Journal of Commerce., 14(56):149-176.
10. Marshall, A., 1920. Principles of Economics: 8th Ed, (Macmill an):115.
11. Mohammadi, T., 2011. pamphlet software of Eviews.
12. Nazemi, F., 2010. The study of macroeconomic variables effect on non-oil exports : Industrial Management Journal of Humanities College, Islamic Azad University, Sanandaj Branch.,10.
13. Pistoresi, B., and A. Rinaldi, 2011. Exports, imports and growth: University di Modena e Reggio Emilia, Department di Economia Politica and ReCent, Via Berengario., 51: 11.
14. Caves, R. E., 1971. International corporations: The industrial economics of foreign investment., 38 (149): 1-27.
15. Smith, A., 1976. The Wealth of Nation: (Liberty Classics) i: 343.
16. Solow, R. 1956. A Contribution to the Theory of Economic Growth: Quarterly Journal of Economics 70 1:65- 94.
17. Tehranchian, A. M., 2002. Export effect on Iran's economic growth: Journal of Political Economic Information ., 164: 258-267.
18. Tehranchian, A. M., 2009. Import effect on Iran's economic growth, Journal of Political Economic Information., 258: 192.
19. Thirlwall, A. P., 1980. Regional Problems are Balance of Payments Problems: Regional Studies., 5: 419-25.
20. Tofighi, H., 2002. The impact of export on Iran's economic growth With emphasis on the Export of technical and engineering services : Economic Research.
21. Http://www.worldbank.org,1993