

**Short-run Effects of Devaluation:
A Disaggregated Analysis of Latin American Exports**

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Abstract

Conventional models examining the relationship between devaluation and exports are based on exchange rate pass through. These suggest that after devaluation exports become cheaper, relative to other exports, and the growing export market is posited to stimulate the economy. If devaluation has a differential effect across commodities, countries can expect different results depending on their portfolios. Therefore, any accurate analysis of the effects of devaluation must take into account the components of a country's export portfolio. The pooled time series estimation for Latin American countries reveals a negative short-run relationship between real devaluation and export growth for most exports at a disaggregated level. The results of this study are far reaching as they suggest that more target policies are better suited to stimulate exports.

Keywords: devaluation, export portfolio, disaggregated exports, Latin America
JEL codes: O11, O40, O54

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Introduction

Conventional models examining the relationship between devaluation and exports are based on the J-curve or exchange rate pass through. These suggest that after devaluation exports become cheaper, relative to other exports, while imports become relatively more expensive. As a result, current account deficits are reduced and the growing export market is posited to stimulate the economy. While devaluation will ultimately balance a country's internal and external sector in the face of macro-mismanagement, its ultimate effect may be to hurt overall export values in the long run if the country's exports are not price sensitive. The value of exports in a country is the sum of all commodities in its portfolio. If devaluation has a differential effect across commodities, countries can expect different results depending on their portfolios. Therefore, any accurate analysis of the effects of devaluation must take into account the components of a country's export portfolio. To this end, we propose a disaggregated analysis of the effect of currency devaluation on exports. Our paper focuses exclusively on the effect of devaluations on export portfolios and leaves the question of import dynamics for another paper.

This study will focus on the short-run effects of real devaluation on export portfolios in Latin America. Latin America is an ideal region in which to initially conduct this study for a number of reasons. First, for most countries in the region the United States is the predominant trading partner. The effect of a dominant trading partner is to minimize cross currency effects. Second, Latin American countries, while similar on some dimensions, also have diversity in their export

portfolios. Diversity exists within countries' portfolios—by sector and factor—and across countries (Amin Gutierrez de Pineres et al., 2000). Third, common characteristics across the countries and their proximity allow reasonable assumptions on substitutability between exports. The substitution effect is relevant because as Bahmani-Oskoe and Niroomand (1998) point out “In formulating a commercial policy or an exchange rate policy, one major concern of policy makers is the responsiveness of trade flows to relative price changes.”[101].

A disaggregated analysis of export portfolios will allow us to clearly examine the short-run effect of the real devaluation on differing export commodity groups. This study may allow policy makers to better judge the overall effect of currency devaluation on the overall welfare of the country. The policy implications of a disaggregated study are substantial. The knowledge of how each sector is differentially affected by a devaluation creates a possibility for governments to target their policies and maximize the benefits while minimizing the negative consequences. Prior research in this area performed at an aggregate level reduces devaluation policies to an all or nothing proposition and does not allow for targeted policy actions.

Literature Review

If devaluation is a policy instrument used to stimulate the economy, the question also arises if it is in a politician's best interest and is the effect truly uniform and beneficial to the economy as a whole. Edwards and Montiel (1989) find that “‘devaluation crisis’ episodes in developing countries have resulted not so much from the occurrence of domestic or external shocks, but from a failure to adjust promptly in response to such shocks.”[902] To combat these conditions, policy makers have relied on orthodox economic policies that suggest currency devaluations. This conventional wisdom predicts that such devaluations will stimulate demand abroad for

cheaper exports and/or substitution away from imports to goods produced at home resulting in overall economic growth. The country's current account or trade balance should improve as exports increase and imports decline. The decline in imports is a result of a fall in purchasing power of the devalued domestic currency (Cooper, R.N., 1971 and Kamin, S., 1988). An improvement in the trade balance is dependent on the devaluation lowering the relative price of exports while also increasing the relative price of imports. Bahmani-Oskooee and Niroomand (1998) estimated the trade elasticities for 30 countries and concluded that devaluations could have a positive effect on the trade balance. A nominal devaluation is effective only if the real exchange rate is affected and the macro economy is realigned.

The question for politicians is whether to devalue, to realign the macro economy, and improve domestic output by stimulating the export and import competing sectors. Devaluations can be risky because they can destabilize the electorate. "Historically, devaluations have generally been traumatic episodes in developing countries. They have often been surrounded by political upheaval, and as a consequence finance ministers and even governments have fallen." (Edwards, 1989, 2) A policy of export subsidies and import tariffs can have a similar effect on relative prices in the trade sector. These are, however, difficult if a country is facing a fiscal crisis and lend themselves to interest group lobbying and discriminatory policies. Devaluation, on the other hand, is blanket policy that affects all sectors and is more uniform in its effect.

One negative effect of devaluation can be inflation. Increased demand for domestic goods, a rise in the price of importables, and intermediate importables can all lead to higher prices. Marc Miles (1979) finds that while balance of payments improves with devaluation, the trade balance

does not imply a monetary phenomenon as opposed to a real one. In a study of non-industrial countries in the 1960s, Bhagwat and Onitsuka (1974) concluded “The short run effect of devaluation on exports is particularly large if there is unutilized capacity in that sector. Also, the easier it is to shift resources into export sector, the greater would be the initial effects of devaluation. However, to sustain the export expansion, the relative price of exports has to be maintained at a higher level than before the devaluation, so that resources and products continue to move into the export sector.” [415] They also found that post devaluation performance of exports improved due to better macroeconomic policies that followed the devaluation and that imports did not decline. The lack of decline in imports could be explained by higher export earnings, inelastic demand and/or lowering of tariffs.

Two major studies by Sebastian Edwards (1989) and Bahmani-Oskoe (1989) do not support the existence of the J-curve. Edwards (1989) focuses on the initial conditions of the macro economy and the consequent effect of the devaluation. He finds “that if a country is indeed in disequilibrium, nominal devaluations can greatly help speed up the real exchange rate realignment. If, however, we start from a situation of equilibrium, a nominal devaluation will be neutral.” [150] Furthermore he concludes that “the evidence discussed here regarding the 39 devaluation episodes strongly suggests that in many cases devaluations have historically been associated with declines in the level of economic activity around its trend.” [324] Bahmani-Oskoe (1989) studied India, Greece, Korea, and Thailand from 1973 to 1980 and concluded that “the trade balances of all four countries improve first and then they deteriorate supporting a pattern of movement that resembles the so called ‘Inverse of the JCurve’. More precisely in the long run, devaluation only improves the trade balance of Thailand.” [553] Empirical studies that

find devaluations to be contractionary in LDC's are Gylfason and Risager (1984), Solimano (1986), Edwards (1986), and Gylfason and Radetzki (1991). Bahmani-Oskoe (1998) extends the analysis using cointegration techniques and finds that there is no long run contractionary relationship between output and devaluations in most LDCs. For a more complete review of the literature on the effect of devaluations on output see Bahmani-Oskoe et al. (2003).

There is new emerging literature examining the effect of exchange rate changes on disaggregated sectoral output (Bahmani-Oskoe et al., 2000; and Kandil et al., 2002). Bahmani-Oskoe et al., 2004 examined bi-lateral trade between the US and other LCD's but not at the sectoral level. Our study differs from these in a number of ways. More recently, Bahmani-Oskoe and Zore (2006) studied the exchange rate sensitivity of import and export trade flows of 66 disaggregated industries in the U.S. They focus on US output, LDC's are included only as bi-lateral trading partners, and the variable of interest is output. Our work examines the direct effect of currency devaluations on disaggregated exports not output and focuses on developing countries, which are most likely to experience significant devaluations.

By examining exports at a disaggregated level we are able to discern the differential effect of the devaluation so that politicians can make more informed decisions when deciding whether or not to devalue. Van der Meulin Rodgers (1998) has one of the only studies on the effect of exchange rate management on export performance across sectors. She finds that for Indonesia between 1972-1994 that non-oil exports respond positively to improved price incentives, including exchange rate devaluation, with its strongest effect in textiles, garments and sawn wood. Her analysis reveals "differences in production functions and in adjustment lags help to explain why

the manufactured exports respond more to changes in price incentives than do the primary commodity exports. In particular the farm products tend to have inelastically supplied inputs (like good quality farm land in the case of coffee) and manufactured products have few inelastically supplied inputs.” [415] She concludes “high export supply price elasticities do not necessarily translate into strong employment growth following a devaluation for such capital intensive sectors as textiles and plywood, and for those sectors with low domestic value added... Similar disaggregated analyses of other developing countries’ trade experiences will improve our understanding of supply-side responses to orthodox policy prescriptions, especially exchange rate devaluation. Policy makers in other countries will then have more information at hand to weigh the benefits of devaluation, primarily export growth across sectors, against the costs, which could include higher inflation.” [415]

A recent study by Kristin Forbes (2002) is the closest attempt to conducting a study of the effect of devaluation on disaggregated data. She performs a series of empirical tests on firm level data for ten commodity industries for the period 1996-2000 and finds that in the short run firms in countries with a devaluation experience higher output growth rates and higher operating profits. Her model provides the starting point of this research but the focus and some of the variables are changed. In the first place, we analyze the effect of devaluations on exports instead of on general output as Forbes (2002) does. Unlike other demand analyses where price elasticities are calculated, we use a direct estimation of the effects of devaluation on nominal exports. Devaluations are computed in real terms taking into account relative prices which allows us to eliminate inflation from the original model. Foreign income is introduced given that is considered a determinant variable in helping a country’s exports. Finally, this study is much

broader in that it includes exports of all industry groups at the two digit SITC code (63 groups) for a time span of 41 years, 1962-2003.¹ Focusing on a majority of Latin American countries allows us to isolate contagion effects in the region.

Empirical Tests

Data

Two-digit SITC nominal export data from the United Nations trade database for the years 1962-2003 were used to create the database for 16 Latin American countries. The countries included in this study are Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Uruguay, and Venezuela. Exchange rate, consumer price index, and world income data were collected from International Monetary Fund Statistics.

Devaluation

Following Edwards' criteria (1989), a significant devaluation is considered to be more than a real 15% depreciation in a country's currency. However, any advantageous effects of devaluation might be offset by its inflationary effect. This is the reason that we consider devaluation in real terms. Thus, real devaluation was determined by the difference between the percentage change in the value of a country's currency and the percentage change of relative prices which is a ratio of domestic consumer price index over the US consumer price index, being both numerator and denominator proxies for inflation in relative terms. The following tables (1a-1b) illustrate major Latin American devaluations based on the 15% rule as defined in our data set. They capture, for example, some of the latest exchange rate decisions from the largest Latin American economies. Thus, the fact that Argentina fixed the peso against the dollar in 1991 through 2001, is reflected

¹ SITC denotes Standard Internacional Trade Classification.

in Table A where no rates appear. Real devaluation (208.26%) takes place at the moment the peso freely flows in 2002. Brazil implemented the *Real Plan* in 1994, until 1998 the *real* is fixed in constant nominal values. In 1999, the Brazilian currency starts floating and devalues by 45.48%. Mexico, during the Tequila Crisis, decided to devalue its currency at the end of 1994 resulting in a real depreciation of 67.19%.

Model

The model is designed to examine the question of how a real devaluation effects export growth.

We estimate the model:

$$\Delta X_{i,t} = F_0 + F_1 \text{Devalue}_{i,t-1} + F_2 \text{Devalue}_{i,t} + F_3 \text{Devalue}_{i,t+1} + F_4 \Delta \text{FY}_t + e_{i,t} \quad (1)$$

where $\Delta X_{i,t}$ is the change in nominal exports of commodity i in year t ; $\text{Devalue}_{i,t-1}$ is dummy equal to 1 if the country which exports commodity i will have a devaluation in the next period; $\text{Devalue}_{i,t}$ is dummy equal to 1 if the country which exports commodity i will have a devaluation in period t ; $\text{Devalue}_{i,t+1}$ is dummy equal to 1 if the country which exports commodity i had a devaluation in the previous period; ΔFY_t is the change in world income, as a proxy for foreign income, in year t ; and $e_{i,t}$ is an independent and identically distributed error term with zero mean and constant variance. The Devalue term reproduce the effect of real devaluation in year t while isolating effects in the periods before and after the devaluation. Foreign income explains the effect on export growth when the former changes. Either $\Delta X_{i,t}$ and ΔFY_t have been constructed the same way, that is, taking natural logarithms on levels and then first differences. The results are percent changes.

Results

The empirical analysis finally focused on fifty-nine commodities. They were chosen according to the number of products exported by the group of Latin American countries included in this sample. Table 2 reports estimates of equation 1. The pooled time-series technique involves the computation of either fixed or/and random effects for the corresponding countries. Model selection criteria based on the Hausman (1978) test determined what effect would fit better the model. This is a formal test of equality of the coefficients estimated by the fixed and random effect estimator. If the coefficients differ significantly, either the model is misspecified or the assumption that the random effect is correlated with the regressor is incorrect. The test indicated that the fixed country effects model was the best fit. The majority of the regressions follow the fixed effects model.² This assumes that explanatory variables affect cross section units (countries) equally. Differences among units caused by their own features are reflected in the intercept.

Table 2 reports estimates for individual export commodity equations corresponding to each of the fifty-nine commodities. A disaggregated analysis allows us to differentiate real devaluation effects on each of two-digit SITC export categories. However, the most remarkable observation is that the short-run response is perverse in most cases. For example, D_t values turn into negative in twenty-six cases. If we add either D_{t-1} and/or D_{t+1} the results increase to a global amount of forty-four out of fifty-nine groups. Thus, 75% of cases have negative effects. According to these results, real devaluations have, in general, perverse consequences regardless the category where exports are classified.

² Hausman test results are available from the authors upon request.

Even though most manufactured trade in Latin America is invoiced in US dollars, real devaluations worsen their export situation more often than not. In principle, a devaluation should not affect exports negatively if firms sell in dollars. Nevertheless, the fact that exports fall in a year means that pre-devaluation contracts have expired and the effect of a new dollar price reduction is larger than the increase in quantity. The result is that export value decreases. A possible explanation of this outcome might be based on the fact that export firms also finance their activity through dollars. When a significant devaluation occurs many companies have difficulties in repaying their debt. Thus, an immediate consequence is that firms slow down production and, and therefore, exports. Other reasons influencing export diminishing activity induced by a devaluation might be related to important capital flight and difficulties in obtaining new either national and international financing.

When examining the results closer we find that the greatest negative effect of real devaluations in period t is on exports of coal, coke and briquettes (32) and war, firearms, ammunition (95) which fall 87.5% and 75.6% respectively. In the period before a real devaluation takes place ($Devalue_{t-1}$), exports of tobacco and manufactures (12) drop slightly by 1.5%. In period $t+1$ exports of fertilizers manufactured (56) and petroleum and products (33) are the sectors that decrease by the most, with corresponding figures of 26.4% and 21.4%.

In examining the sectors in which a devaluation had a positive impact, most of them are in the lagged devaluation variables.³ For example, dyes, tanning and color products (53) undergo a 9.3% improvement before a real devaluation takes place. The effect in machinery for particular

³ There are 6 categories. If we take into account the scenarios (Devalue t-1; Devalue t; Devalue t+1) where positive effects are not mixed with negative ones then the categories decrease to 3 being in this case 5 percent of total export sectors.

industries (72) is about 13%. The other three categories with positive effects in $t-1$ are followed by a decline in period t . These sectors are animal oils and fat (41) whose 22% exports growth in $t-1$ is cancelled out by a 30% fall in t when the real devaluation occurs. The same situation occurs in both power-generating machinery and equipment (74), although in this case the negative effect after *Devalue* t holds in the following period $t+1$, and war, firearms and ammunition (95). Only the pulp and waste paper (25) sector experiences an increase in $t+1$. Exports growth improves 13.7%.

There is no statistical evidence revealing a relationship between exports and real devaluations for the rest of export sectors (twelve sectors or 20% of the sample). These sectors are: dairy products and eggs (02); fish and preparations (03); coffee, tea, cocoa, spices (07); animal feeding stuff (08); beverages (11); rubber, crude and synthetic (23); textile fibres (26); gas natural and manufactured (34); iron and steel (67); travel goods and handbags (83); zoo, animal pets (94); coin, gold (96).

Finally, it should be noted that unlike real devaluations, changes in foreign income improve export growth for more than 50% of export-oriented industries. The income elasticities range from 1.93 to 7.14. This would confirm the influence that foreign income has as a main determinant of export behavior.

Conclusion

Devaluation is a policy instrument designed to align an economy and, hopefully, stimulate economic growth by promoting exports. While devaluation policies purport positive economic

outcomes, the political response is not always appropriate. Devaluations can foster instability, coups, riots, and other forms of civil unrest as national wealth is reduced.

This paper analyzes in a direct way the short-run effects of real devaluations on disaggregated exports in Latin America for the period 1962-2003. The economic theory points out that in the short run, export demand elasticities may be relatively low because existing contracts must still be honored. Our research shows that real devaluations in the short term worsen exports for about 75% of export sectors in Latin America. They affect export sectors without distinction as to whether products incorporate more added value or less added value. Only 5% of these industries experience favorable effects from a real devaluation. There may be several reasons explaining a perverse effect in the majority of them. Firstly, as the foreign price of exports falls and so will the value of nominal exports. Secondly, a feature that characterizes most of financing activities in the target region is that firms are indebted in dollars which means that they not only lose the incentive to invest and increase production capacity in order to supply foreign markets but also they have to repay their debt. In the latter case, some are forced to close down their businesses as they cannot repay debt. Finally, devaluations have forced significant capital flight in the region. This will negatively affect investment and production with negative impacts on the export sector and the economy's growth potential. Moreover, in face of devaluation, developing countries find it harder to acquire international credit. This will, undoubtedly, place them into a more difficult situation.

In view of these results, politicians would be best advised to carefully examine their country's export portfolio before instituting a uniform devaluation. Targeted policy solutions may be more

advisable for stimulating exports. Future research on both the long-term analysis of exports and the examination of the other side of the coin, that is, imports remains to be done.

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Table 1a. Major Real Devaluations in Latin America (percentages)

	Argentina	Bolivia	Brazil	Chile	Colombia	Costa Rica	Ecuador	El Salvador
1962	62.63	-	-	43.27	32.97	-	-	-
1963	-	-	-	-	-	-	-	-
1964	15.17	-	109.02	-	-	-	-	-
1965	-	-	-	-	48.18	-	-	-
1966	-	-	-	-	-	-	-	-
1967	199.04	-	-	113.25	-	-	-	-
1968	-	-	24.00	-	-	-	-	-
1969	-	-	-	-	-	-	-	-
1970	-	-	-	-	-	-	39.61	-
1971	-	-	-	184.88	-	-	-	-
1972	-	65.39	-	-	-	-	-	-
1973	-	-	-	1065.48	-	-	-	-
1974	-	-	-	-	-	-	-	-
1975	962.43	-	-	-	-	-	-	-
1976	-	-	-	-	-	-	-	-
1977	-	-	-	-	-	-	-	-
1978	-	-	-	-	-	-	-	-
1979	-	-	66.06	-	-	-	-	-
1980	-	-	-	-	-	-	-	-
1981	178.41	-	-	-	-	296.87	-	-
1982	420.35	596.81	-	46.36	-	-	23.01	-
1983	49.15	-	154.84	-	-	-	19.38	-
1984	71.74	415.36	38.88	-	16.92	-	-	-
1985	-	78.22	-	80.10	31.42	-	18.95	-
1986	-	-	-	-	-	-	32.21	70.47
1987	75.34	-	167.29	-	-	-	26.36	-
1988	-	-	307.07	-	-	-	43.15	-
1989	103.92	-	161.01	-	-	-	-	-
1990	-	-	-	-	-	-	-	42.95
1991	-	-	84.68	-	-	-	-	-
1992	-	-	82.93	-	-	-	-	-
1993	-	-	448.61	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-
1998	-	-	-	-	-	-	20.11	-
1999	-	-	45.39	-	15.79	-	147.61	-
2000	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-
2002	208.26	-	-	-	19.79	-	-	-
2003	-	-	45.48	-	-	-	-	-

Table 1b. Major Real Devaluations in Latin America (percentages)

	Guatemala	Honduras	México	Panama	Paraguay	Peru	Uruguay	Venezuela
1962	-	-	-	-	-	-	-	-
1963	-	-	-	-	-	-	-	-
1964	-	-	-	-	-	-	-	37.42
1965	-	-	-	-	-	-	166.34	-
1966	-	-	-	-	-	-	-	-
1967	-	-	-	-	-	37.47	78.30	-
1968	-	-	-	-	-	-	-	-
1969	-	-	-	-	-	-	-	-
1970	-	-	-	-	-	-	-	-
1971	-	-	-	-	-	-	-	-
1972	-	-	-	-	-	-	121.50	-
1973	-	-	-	-	-	-	-	-
1974	-	-	-	-	-	-	17.12	-
1975	-	-	-	-	-	-	-	-
1976	-	-	50.01	-	-	27.91	-	-
1977	-	-	-	-	-	58.30	-	-
1978	-	-	-	-	-	-	-	-
1979	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-
1982	-	-	218.14	-	-	40.30	177.67	-
1983	-	-	-	-	-	24.91	-	-
1984	-	-	-	-	75.14	49.28	23.21	67.46
1985	-	-	40.71	-	-	-	-	-
1986	115.57	-	65.62	-	42.53	-	-	83.82
1987	-	-	15.81	-	-	57.43	-	-
1988	-	-	-	13043.7	-	777.69	-	121.12
1989	19.43	-	-	-	100.85	-	-	-
1990	-	150.84	-	666.93	-	2631.44	-	-
1991	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	67.19	-	-	-	-	-
1995	-	-	-	-	-	-	-	150.34
1996	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-
1998	-	-	-	-	-	-	-	-
1999	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-
2001	-	-	-	-	28.43	-	16.51	-
2002	-	-	-	-	42.93	-	71.98	63.12
2003	-	-	-	-	-	-	-	-

Table 2 Regression estimates: Effects of real devaluations on export growth

Dependent Variable	Devaluation dummies			Foreign Income	Num. Obser.	R ²
	D _{t-1}	D _t	D _{t+1}			
Live animals (00)	0.067 (0.130)	-0.107 (0.114)	-0.154** (0.076)	4.375*** (1.546)	438	0.03
Meat and preparations (01)	0.009 (0.043)	0.132 (0.101)	-0.095* (0.052)	7.145*** (9.230)	441	0.08
Dairy products and eggs (02)	-0.032 (0.121)	0.127 (0.185)	0.206 (0.244)	-3.843 (4.383)	309	0.07
Fish and preparations (03)	-0.003 (0.033)	-0.040 (0.036)	-0.009 (0.051)	-1.213 (1.010)	437	0.06
Cereals and preparations (04)	0.016 (0.145)	-0.164** (0.081)	-0.036 (0.125)	-1.562 (3.177)	449	0.03
Fruit and vegetables (05)	0.008 (0.049)	-0.087*** (0.025)	-0.070 (0.053)	-0.102 (0.953)	415	0.08
Sugar, honey, and preparations (06)	0.084 (0.062)	-0.178*** (0.059)	-0.073 (0.080)	2.656*** (0.903)	471	0.03
Coffee, tea, cocoa, spices (07)	-0.009 (0.033)	-0.054 (0.034)	-0.063 (0.042)	3.773*** (0.687)	510	0.04
Animal feeding stuff (08)	0.023 (0.043)	-0.109 (0.070)	-0.069 (0.086)	2.515 (1.598)	442	0.03
Miscellaneous meat preparations (09)	-0.021 (0.101)	-0.180** (0.080)	-0.116 (0.084)	3.607*** (1.216)	415	0.08
Beverages (11)	-0.036 (0.061)	-0.056 (0.054)	0.071 (0.071)	1.969** (0.968)	418	0.10
Tobacco and manufactures (12)	-0.151** (0.073)	-0.040 (0.038)	0.049 (0.058)	-0.870 (1.408)	409	0.04
Hides, skins, furskins, raw (21)	0.050 (0.061)	0.115 (0.147)	-0.203*** (0.070)	5.891** (2.279)	296	0.04
Oil-seeds, nuts, kernels (22)	0.276 (0.090)	-0.069 (0.118)	-0.151* (0.083)	4.499*** (1.609)	362	0.03
Rubber, crude and synthetic (23)	-0.011 (0.242)	-0.145 (0.251)	0.245 (0.258)	-0.387 (5.761)	271	0.06
Wood, lumber and cork (24)	-0.012 (0.050)	0.052 (0.040)	-0.106* (0.063)	2.446* (1.49)	428	0.04
Pulp and waste paper (25)	-0.001 (0.119)	0.082 (0.105)	0.137* (0.080)	3.291 (2.326)	272	0.04
Textile fibres (26)	-0.035 (0.050)	-0.075 (0.098)	0.008 (0.038)	2.918** (1.149)	483	0.03
Crude fertilizers and minerals (27)	0.042 (0.031)	-0.022 (0.035)	0.195*** (0.051)	0.026 (0.721)	415	0.06
Metalliferous ores, scrap (28)	0.052 (0.038)	-0.036 (0.036)	-0.125*** (0.040)	1.362 (1.123)	439	0.06
Crude animal and vegetable materials (29)	0.020 (0.026)	-0.061** (0.026)	-0.005 (0.031)	-0.121 (1.104)	379	0.04
Coal, coke, briquettes (32)	0.490 (0.408)	-0.875** (0.396)	0.507 (0.407)	-3.736 (13.805)	148	0.14
Petroleum and products (33)	0.084 (0.080)	-0.101** (0.042)	-0.214*** (0.051)	-3.932 (2.895)	428	0.05
Gas natural and manufactured. (34)	0.100 (0.293)	0.397 (0.699)	0.345 (0.496)	14.012 (15.081)	165	0.05
Animal oils and fat (41)	0.222* (0.119)	-0.308* (0.119)	0.131 (0.119)	0.050 (0.119)	267	0.05

	(0.121)	(0.184)	(0.103)	(4.125)		
Fixed vegetable fats and oils (42)	-0.059 (0.044)	-0.060 (0.076)	-0.107* (0.058)	-0.426 (2.454)	340	0.05
Processed animal, vegetable fats and oils, etc (43)	0.147 (0.059)	-0.096 (0.101)	-0.131*** (0.042)	2.020* (1.23)	305	0.04
Organic chemicals (51)	-0.019 (0.052)	-0.071* (0.043)	0.035 (0.053)	3.229*** (0.544)	441	0.04
Inorganic chemicals (52)	0.055 (0.079)	0.027 (0.055)	-0.078* (0.052)	3.372 (4.552)	179	0.14
Dyes, tanning, color products (53)	0.093*** (0.034)	-0.016 (0.062)	-0.019 (0.036)	2.217** (1.090)	397	0.11
Medicinal, pharmaceutical products (54)	-0.100 (0.063)	-0.135*** (0.030)	-0.009 (0.020)	-0.246 (1.200)	447	0.08
Perfume, cleansing preparations (55)	0.010 (0.505)	-0.680*** (0.249)	0.464 (0.538)	1.938*** (0.425)	164	0.23
Fertilizers manufactured (56)	0.039 (0.134)	0.039 (0.086)	-0.262** (0.119)	5.422 (4.784)	275	0.05
Explosives pyrotechnic products (57)	0.038 (0.119)	-0.225* (0.125)	-0.189*** (0.059)	-3.470 (2.188)	219	0.07
Plastic materials (58)	-0.001 (0.078)	-0.171** (0.085)	-0.018 (0.066)	6.440*** (1.530)	383	0.10
Chemical materials (59)	-0.071 (0.074)	-0.115* (0.071)	-0.070 (0.085)	2.351 (1.920)	347	0.04
Leather manufactures (61)	0.074 (0.031)	-0.060* (0.033)	-0.126** (0.064)	5.235*** (1.484)	434	0.06
Rubber manufactures (62)	0.039 (0.091)	-0.009 (0.052)	-0.092* (0.056)	5.988*** (1.455)	387	0.05
Cork and wood manufactures (63)	-0.028 (0.049)	0.007 (0.053)	-0.090* (0.051)	5.228*** (1.121)	462	0.09
Paper, paperboard and articles of paper pulp (64)	0.055 (0.055)	-0.241*** (0.048)	-0.068 (0.066)	4.929** (2.333)	447	0.04
Textile yarn, fabrics (65)	0.054 (0.050)	-0.079* (0.050)	-0.121*** (0.039)	5.835*** (1.103)	500	0.10
Non-metallic mineral manufactures (66)	0.030 (0.024)	-0.093* (0.058)	0.027 (0.046)	2.936** (1.175)	477	0.06
Iron and steel (67)	-0.017 (0.089)	0.029 (0.039)	0.072 (0.067)	4.474* (2.652)	399	0.07
Non-ferrous metals (68)	0.016 (0.049)	-0.093* (0.057)	-0.053 (0.035)	5.747*** (0.818)	441	0.05
Manufactures of metals (69)	0.092 (0.071)	-0.214*** (0.063)	-0.094** (0.044)	3.333*** (1.005)	482	0.07
Power-generating machinery and equipment (71)	0.146* (0.896)	-0.171** (0.079)	-0.151* (0.079)	0.869 (1.570)	451	0.05
Machinery for particular industries (72)	0.129* (0.076)	-0.077 (0.068)	0.078 (0.073)	3.729** (1.813)	433	0.05
Metalworking machinery (73)	-0.103 (0.069)	-0.324*** (0.083)	-0.045 (0.103)	3.585** (1.403)	107	0.22
Prefabricated buildings (81)	0.146 (0.077)	-0.060* (0.038)	-0.059 (0.075)	2.691** (1.245)	321	0.06
Furniture, bedding, mattresses (82)	0.111 (0.104)	0.059 (0.040)	-0.133** (0.065)	6.273*** (1.732)	379	0.09
Travel goods, handbags (83)	-0.101 (0.125)	-0.114 (0.158)	-0.894 (0.748)	6.811*** (1.504)	269	0.15
Clothing (84)	0.009 (0.065)	-0.102** (0.041)	0.036 (0.071)	3.020** (1.179)	408	0.18

Footwear (85)	0.054 (0.056)	-0.143*** (0.049)	-0.101 (0.075)	2.969*** (1.076)	375	0.13
Instruments, watches, clocks (86)	-0.048 (0.046)	-0.083 (0.076)	-0.126** (0.065)	2.571 (2.298)	273	0.05
Miscellaneous manufactured articles (89)	-0.028 (0.037)	-0.028 (0.048)	-0.107** (0.053)	1.974* (1.222)	504	0.05
Special transactions (93)	-0.078 (0.067)	0.002 (0.034)	-0.181*** (0.064)	3.981* (2.396)	257	0.07
Zoo animals, pets (94)	-0.051 (0.121)	0.002 (0.099)	-0.304 (0.250)	2.505 (3.564)	284	0.05
War, firearms, ammunition (95)	0.898* (0.547)	-0.756** (0.356)	0.217 (0.624)	4.388 (13.74)	177	0.08
Coin, gold (96)	-0.446 (0.359)	0.229 (0.371)	-0.594 (0.603)	-2.430 (2.222)	175	0.06

Estimates of standard errors, in brackets, are computed using Cross-section weights PCSE (Panel Corrected Standard Errors) method which corrects for any panel heteroschedasticity.

*** Significance at 1% level

** Significance at 5% level

* Significance at 10% level