Perspectives on Total Factor Productivity and Foreign Direct Investment in OECD Countries based on Panel Data Econometrics

Author: **Neil Dias Karunaratne,** School of Economics, The University of Queensland, Brisbane, Australia, n.karunaratne@uq.edu.au

The role of FDI inflows and outflows to host countries and from the source countries emerged in the 1980s as the major vehicle technology transfer that accelerated the globalization or international integration of 25 leading OECD economies over a period of 25 years (1983-2007). Although neoclassical and endogenous growth theories provide unequivocal support for FDI flows because they generate positive externalities or spillover effects through channels of GDP growth, capital formation and R&D, the empirical evidence in support of these claims are mixed. The panel data econometrics performed using a new multiplicatively complete index of total factor productivity provide fresh insights on the cross-border FDI generated through technology transfer and other channels. The empirical findings for the OECD countries are markedly different from the spillover effects on developing countries that are plagued by technology absorptive capacity effects due to the operation of threshold effects of underdeveloped human capital resources. The empirics on cross-border FDI flows and the spillover effects that they generate in OECD countries will provide much needed information to design and implement policies to harness the net benefits from cross-border FDI flows and shed light on the design of policies to reconcile the conflicting policies of austerity and growth that are required to prevent the sovereign debt racked euro-zone countries from imploding the single currency union based on the euro.

Keywords: *FDI . Externalities. Panel Data Econometrics. OECD. Euro.*

JEL Classification: *O11, O40, F21, F23*

Abbreviations

ABS	Australian Bureau of Statistics
ADF	Augmented Dickey Fuller
AIC	Akaike Information Criterion
CPI	Consumer Price Index
CRS	Constant Returns to Scale
DW	Durbin Watson
FDI	Foreign Direct Investment
FE	Fixed Effects
FGLS	Feasible Generalized Least Squares
GDP	Gross Domestic Product
GERD	Gross Expenditure on R&D
GLS	Generalized Least Squares
ICT	Information and Communication Technology
IMF	International Monetary Fund
IPD	Implicit Price Deflator
ISIC	International Standard Industrial Classification
KPSS	Kwiatowski, Phillips, Schmidt and Shin
MFP	Mutlifactor productivity
MNCs	Multinational Corporations
OECD	Organization for Economic Co-operation & Development
OLS	Ordinary Least Squares
PC	Productivity Commission
PPP	Purchasing Power Parity
R&D	Research and Development
RE	Random Effects
TFP	Total Factor Productivity
TNC	Transnational corporation
UNCTAD	United Nations Conference on Trade and Development
VA	Value Added
WTO	World Trade Organization

Introduction

The OECD economies are currently in the throes of a sovereign debt crisis that threatens to wreck the euro zone or the common currency union that was established after the Maastricht treaty (1991). The euro zone economies, the PIGS (Portugal, Italy, Greece and Spain) are hovering on the brink of insolvency due to their inability to service their sovereign debt and contain their deficits without a massive bail out from the European Central Bank and the IMF. The strategies to avert the break-up the euro zones advocate the implementation of polices of austerity (spending- cuts) on the one hand and growth on the other, in the debt ravaged OECD countries.

This paper presents empirics on how to reconcile policies of austerity, which is code for increase in Total Factor Productivity (TFP) with growth, which is the code for increasing cross-border FDI flows. The impending implosion of the euro zone requires the implementation of massive structural adjustment in the shape of tax-payer funded bailouts to recapitalize banks in the PIGS. The failure to do so would lead to the break-up of the single currency union or the euro zone with the resulting crisis contagion not only adversely affecting the economies of the OECD but also the global economy.

The cross-border transfer and diffusion of technology through Foreign Direct Investment (FDI) under the aegis of Multinational Corporations (MNCs) has been a major force in the globalization or linking of the OECD counties more rapidly with the international economy during the study period 1983-2007. The nexus between cross-border FDI flows and the acceleration of GDP growth has been the subject of intensive research and heated debate over in recent decades. Both neoclassical economic theory and endogenous or new growth theory lend unequivocal support to the proposition that FDI flows are vehicles of cross-border transfer of technology that accelerates productivity and potential growth in both the host and source countries. However, empirical studies fail to match the hype of economic theory and an acrimonious debate has raged between supporters of increased FDI flows and those opposed to such increases on diverse grounds that range from environmental pollution to the undermining of national interest and economic independence.

The literature survey undertaken for this study clearly reveal that despite the overwhelming theoretical support for cross-border FDI flows on the grounds that they are vehicle for transfer of technology and act as the motor of productivity and GDP growth by generating benign technological externalities or spillover effects the empirical evidence in support of these claims are at best mixed. In this paper, we identify some of the grounds for this skepticism and provide statistical evidence based on panel data econometrics shedding light on the nexus between FDI and TFP on several issues: First, the failure of the FDI flows, GDP and TFP growth to live up to the theoretical hype is examined, and its genesis due to the methodological flaws that mired past studies is addressed. In this regard a major flaw lies in the use of OLS estimates based on pooled cross-section time series approach that fails to take remedial measures to overcome the problems associated with parameter heterogeneity, outliers, omitted variables, model uncertainty, measurement error and endogeneity, low power of statistical tests that sap the reliability out of the empirics churned out by these methods. In this paper, we attempt to overcome these deficiencies by applying panel data econometric techniques. Second, much of the theoretical and empirical analysis relating to the FDI flows has focused on the externalities or spillover effects associated with the promotion of GDP growth. However, in this paper argue that the focus should be directly on the nexus between TFP growth and FDI flows rather than on the misplaced focus on the more amorphous measure, GDP growth. Second, in order to analyze more incisively the technological spillovers generated by TFP growth due to FDI flows the paper covers new ground by analyzing the empirical results related to the computation of multiplicatively complete TFP indexes that links FDI to TFP and technological spillovers effects that can be measured in the shape of scale economies, technical efficiency and technological change. Third, the paper also advances the knowledge frontier on the TFP-FDI empirics by considering both the crowding- out and crowding-in effects of cross-border, FDI flows on both the host country and the source country domestic investments and industries. These positive or negative spillover effects from the cross-border MNC- FDI flows that may be driven by the pecuniary motives of lowering production costs by vertical integration or by the motive to access to new markets through horizontal integration are reviewed. Fourth the empirical analysis undertaken in this paper recognizes that the level of human capital and institutional fabric may impose constraints on the absorptive capacity of technology transferred by FDI to generate positive technological spillover effects on the host or source country. In particular we recognize that absorptive capacity for technology transferred by FDI is vastly different from that prevailing in developing countries hamstrung by poor infrastructure, lack of sound banking and financial institutions, law and order and a business friendly environment. The empirical analysis undertaken in this study has used the most up-to-date panel dataset for 25 OECD countries over the span of 25 years (1983-2007). The panel data set has been sourced from the most authoritative databases available from international organizations like the OECD, UNCTAD, World Bank and independent sources such as the Penn World Tables.

It is worthwhile recapitulating and elaborating on the contributions of the paper's claims to make in advancing the knowledge frontier on the FDI-TFP empirics and on at least five fronts: i. The paper has refocused attention on the TFP linked spillover effects in this study rather than on the more indirect GDP related spillover effects that has been the focus of most empirical studies on FDI flows undertaken hitherto. ii. The paper contributes to the advancement on the knowledge frontier on cross-border MNC-FDI flows by analyzing spillover using for the first time a multiplicatively complete index, which enables the decomposition o of technological change due to FDI flows into measurable spillover effects in the form of scale economies and technical efficiency. iv. The empirical results reported in this paper are fully cognizant of the consequences of the divergence in the absorptive capacity in host and source countries for metabolizing and generating spillover effects. In particular developing countries lack the human capital, infrastructure, banking and financial institutions and business ethos that gives OECD countries a head start over developing countries in attracting MNC-FDI flows. iv. The empirical results of the study have taken account of both the crowding-in and crowding-effects on domestic firms of both FDI inflows and outflows in a symmetric manner unlike many other studies that have focused only on one side of the coin .v. Finally the empirics in the paper are based on the compilation of an up-to-date and comprehensive panel database from the most authoritative international and national databases that have been published recently.

The stylized facts reported in Table 1 indicate that over the past three decades since the 1980s world FDI outward stocks and inward stocks have increased more than 25-fold and 30-fold, respectively. The growth of both inward and outward FDI stocks for the world has outstripped the growth rates of GDP and exports after registering temporary drops during the Asian Financial Crisis (1997) and the Global Financial Crisis (2007). It is noteworthy that for advanced countries, FDI flows exceeded the growth rates of GDP and exports and these strong growth trends are likely to continue into the foreseeable future. Although the Asian Financial Crisis (1997) and the Global

Financial Crisis (2007) caused a dent in the inward and outward stocks of FDI, the stylized facts reported in Table 1 show that bi-directional flows have grown at phenomenal rate over the two decades since 1980. The growth of FDI inward and outward flows have exceeded the world growth rates of exports and GDP. These stylized facts indicate that FDI will continue to power the growth of productivity and growth in the world economy. Policymakers in both developed and developing countries have re-designed policies to attract FDI flows. An index of national regulatory changes compiled from survey data from the World Investment Report (UNCTAD) shows that over the 15 years (1992-2006) 80 percent of regulatory changes undertaken by policymakers in the global economy has been aimed at encouraging FDI flows to the host countries (Contessi and Weinberger 2009).

Table 1: Stylised facts on inward & outward
Fdi stocks (1980-2000) us$ billion.

	ECONOMY		FDI	Stock		Annual Growth Rates		
FDI Stock	Developing economies	299	524	1728	4893	5.8	12.7	12.3
Outward	Developed economies	401	1555	5653	12325	14.5	13.8	9.0
	World	700	2082	7442	17743	11.5	13.6	10.1
FDI Stock	Developing economies	72	145	863	2691	7.3	19.5	13.5
Inward	Developed economies	477	1941	7083	16011	15.1	13.8	9.5
	World	549	2086	7967	18982	14.3	14.3	10.1
GDP	Developing economies	2594	3956	6973	16606	4.3	5.8	10.1
Nominal	Developed economies	8297	11427	24720	38817	3.3	8.0	5.1
	World	11897	22262	32089	57193	6.5	3.7	6.6
Exports	Developing economies	670	996	2404	5811	4.0	9.2	10.3
	Developed economies	1663	3189	5393	9452	6.7	5.4	6.4
	World	2424	4311	7975	15834	5.9	6.3	7.9

Source: UNCTADSTAT (2010) UNCTAD

Attracting FDI has been a major plank of national development strategies in both developed and developing economies. At national level there are strategies to reduce entry barriers (protection) and offer incentives to FDI (tax-holidays). Table 2 below reports the strong trends in the increase in OECD inflows and outflows during the 14 year period (1995-2008) in most OECD countries is shown below. USA recorded an inflow of more than 5 fold, nearly 5-fold Australia nearly 4 fold. The outflow of FDI during the 14 year period was more than 3-fold for USA and more than a 10-fold for Australia. The FDI flows, are likely continue to increase the stock of domestic capital in most FDI during the next decade and is likely to play a pivotal role in increasing productivity and growth in OECD economies.

Table 2: Trends in FDI Inflows & Outflows - OECD (1995-2008) $US bn

FDI	Inflow %Change			Outflow %Change		
Years	1995	2008	1995-2008	1995	2008	1995-2008
Australia	12.0	46.6	389.2	3.3	35.8	1090.2
Austria	1.9	13.5	710.3	1.1	28.2	2489.7
Belgium		59.6			68.1	
Canada	9.3	44.7	482.9	11.5	77.6	677.2
Denmark	4.2	10.7	256.2	3.1	27.3	891.3
Finland	1.1	-4.2	-394.4	1.5	1.6	108.6
France	23.7	97.0	409.6	15.8	200.0	1269.0
Germany	12.0	24.9	207.0	39.1	156.2	399.9
Greece	1.2	5.1	424.3		2.6	
Iceland	0.0	-0.4	-4211.1	0.0	-8.1	-32400.0
Ireland	1.4	-12.3	-851.5	0.8	13.2	1610.0
Italy	4.8	17.0	353.0	5.7	43.8	763.5
Japan	0.0	24.4		22.6	128.0	565.6
Korea	1.8	2.2	123.9	3.6	12.8	360.2
Mexico	9.7	22.0	226.8		0.7	
Nether-lands	12.3	-9.1	-73.6	20.2	53.1	263.3
New Zea-land	2.9	2.0	69.3	1.8	0.1	5.6
Norway	2.4	-0.1	-3.9	2.9	28.1	983.3
Portugal	0.7	3.5	534.1	0.7	2.1	306.9
Spain	6.3	65.4	1040.8	4.2	77.2	1855.9

Sweden	14.4	40.4	279.6	11.2	40.2	358.4
Switzerland	2.2	17.4	782.7	12.2	86.3	706.2
Turkey	0.9	18.2	2053.2	0.1	2.6	2287.6
United Kingdom	20.0	96.0	480.6	43.6	110.4	253.5
United States	57.8	319.7	553.4	98.8	332.0	336.2
OECD 25 total	201.8	908.4	450.2	302.0	1518.1	502.7
% of total	89.6	89.0	99.3	95.7	93.1	97.2

Sources: OECD Factbook 2010: Economic, Environmental and Social Statistics OECD 2010

The rest of the paper is organized as follows: Section 2 presents an annotated literature review on the role played by FDI in generating TFP and growth through net positive spillover effects or positive externalities. Section 3 outlines the methodology used in this paper to measure a multiplicatively complete index of TFP that is decomposable into components of technical change and various measures of technical efficiency that can act proxy measures of technological spillover effects due to FDI. Section 4 outlines the methodology of panel data econometrics that has been deployed in this study to measure the link between changes in TFP and FDI in the context of other major explanatory and controlling variables governing the economies of the panel of OECD countries studied in this paper. Section 5 presents the key empirical findings that link TFP changes to cross-border FDI flows subject to openness, R&D, capital formation and control variables due to policy effects of inflation and government spending and business cycle effects. Section 6 concludes the paper offering some policy perspectives.

Literature Review

The importance of increasing total factor productivity or output as ratio of the various factor input is widely recognized to be a key determinant of a nation's growth and enhancement of the living standards of its populace as underscored in the quotes of several eminent economists:

"Productivity... in the long run it is almost everything." (Krugman,1994). "Nothing contributes more to reduction of poverty..", than productivity

(Blinder, 1993) “Productivity is the prime determinant in the long run of a nation’s standard of living. “ (Porter,1991).

The empirical literature on the measurement of productivity identifies as a core indicator increase in per capita GDP as a measure of improvement a country’s living standards due to technical progress. The literature identifies technological change as an important determinant of growth and productive externalities. Neoclassical growth theory identified exogenous technical progress as an important driver of growth (Solow, 1956). Endogenous growth models ascribe an important role to technological change for achieving perpetual or sustainable economic growth (Romer, 1990). These growth theories haves have identified two important channels through which FDI transfers technological change across borders. The first channel, known as the diffusion channel plays a catalytic role in advance countries by generating productivity externalities through the transfer x-efficiency (i.e. managerial, marketing, product and process innovation, and access to markets and adaptation of advance country technologies) according to (Coe, 1995, Grossman, 1991, De Mello., 1997). The second channel through which FDI transfers technology is known as the absorption channel and plays a significant role in increasing productivity and growth in the host country by facilitating the absorption, adaptation, imitation , ‘learning- by- doing’ and reverse engineering of new technology innovated in advance countries i(Coe, 1995, Savvides, 2005)

In this paper, we regard the increase in nation’s TFP as the major fulcrum that generates positive externalities or spill over effects due to the cross-border transfer of technology via FDI.

The major bone of contention is whether inward FDI stocks complements (crowds-in) or substitutes (crowds-out) domestic investment. The crowding-in hypothesis contends that FDI inward stocks alters the ownership structure of domestic investment and provides additional capital, technological know-how, R&D that stimulates product and process innovation, provides access to overseas marketing net works – and thus increases the profitability of domestic investors. On the contrary, the crowding-out hypothesis contends that FDI inward stocks reduces the market share of domestic firms, decreases profitability and drives domestic firms to the wall. Below, we list the arguments that have been advanced by the proponents of the crowding-in and crowding-out hypothesis based on a selective survey of the literature.

The proponents of the crowding-in hypothesis assert that FDI inflows cause's domestic firms in the host country to: i. Increase their investment in the domestic firms in order to meet the competitive challenges posed by FDI (De Mello, 1999). ii. FDI inflows could increase investment in infrastructure (transport and telecommunication) (Cardoso and Dornbusch, 1989). iii. FDI brings in its train the firm specific assets that promote innovation of new products and processes (Herzer, 2008) (Blomström M., 1998). iv. FDI will increase demands for host country factor inputs (capital and labour). v. FDI will create agglomeration economies that attract more foreign investors and increase complementarities to host country firm(Markusen J R and Venables A J., 1998) The operation of the crowding-hypothesis is conditional on the host country attaining threshold levels of human capital development (Carkovic. M. and Levine. R. , 2009, Borensztein, 1998) , degree of openness to trade (Balasubramanyam, 1996, Bhagwati, 1978), level of financial sector development (Alfaro, 2004)

The proponents of the crowding-out hypothesis associate a number of adverse effects with FDI inward stocks. i. The technological superiority of FDI gives them an advantage over domestic firms to exploit profitable investment opportunities that arise ((Fry M.J., 1992, Agosin M. R. and Mayer R., 2000). (Kokko A., 1994). ii. Under conditions of imperfect competition the advent of FDI in the host country could reduce the market share of domestic firms and drive them to the wall due to reduce profitability (Kokko A., 1994). iii. Domestic investment has no crowding out effects on domestic investments by increasing imports and causing a worsening of the terms of trade increases in the current account and balance of payments deficits(Stevens, 1992).iv. FDI can also crowd-out domestic firms because of the inability of domestic firms to compete successfully with MNCs and their affiliates and subsidiaries for the limited credit and financial resources that are available to a host nation (Apergis N. Katrakilidis C. and Tabakis M., 2006). The openness to trade and investment through trade liberalisation does not appear to have crowding out effects on domestic investment according to studies by (Harrison(Harrison A. and Revenga A., 1995).

The crowding-in and crowding-out effects of FDI operate through a complex matrix of channels giving results that diverge from theoretical predictions and intuition of the policymakers. Therefore, whether FDI inflows can through net crowding-in effects can generate positive externalities in the host or source country has to be resolved by empirical analysis(Desai and . 2005). A task which will be addressed in the next section.

FDI by MNCs are motivated by the objective of lowering production costs either by vertical integration abroad or through access to new markets through horizontal integration. The positive negative spillover effects from these different types of integration vary according to the degree of FDI competition with domestic firms and market share in the host economy (Arndt, 2010). Cross-country regressions empirics performed at the macro-level indicate that technology transfer by FDI flows have different types of growth and productivity externalities in advanced and developing countries. In developing countries for technology transfer through FDI to ignite positive growth and productivity externalities it is imperative that the developing country should have attained a critical threshold level of human capital development, well functioning capital markets and open or liberal trading regimes to have the absorptive capacity to benefit from the technology transferred by FDI (Carkovic, 2009, Borensztein, 1998, Xu, 2000a, Carkovic. M. and Levine. R. , 2009) . Some cross-country regression studies demonstrate that technology transfer through FDI flows generate positive externalities in host countries even if there is no strong absorptive capacity due to the absence of a developed human capital threshold (Khawar, 2005). Some cross-country regression studies based on developing countries demonstrate that openness to trade through the implementation of export oriented industrialization strategies rather than inward looking import substituting industrialization strategies are crucial for the positive growth and productivity externalities for technology transfer through FDI flows to occur(Balasubramanyam, 1996, Xu, 2000b) However, allowing unfettered technology transfer through FDI by removing capital controls before the establishment of a sound financial and banking system could lead to moral hazard outcomes due to the absence of prudential supervision of FDI flows rendering the host country vulnerable to financial crises due to 'sudden stops' of capital flows due to panic behavior by foreign investors (Bhagwati, 1978, Stiglitz, 2009)

The above literature review clearly establishes the case to analyze the effects of FDI flows on advanced countries separately from those of developing countries as they are subject to different human capital and financial structure threshold effects. Furthermore, the importance of analyzing the effects of spillover effects of FDI flows by focusing on components of total factor productivity rather than GDP growth is more insightful and provides useful guidelines for policymakers confronted with task of designing policies for regulating the inflow and outflow of FDI flows in a manner consistent with national interest.

The literature of the empirical effects o cross-border net FDI inflows are shrouded in ambiguity and therefore rigorous empirical analysis is required to shed light on the complex dynamics linking cross-border FDI flows and the TFP related spill over effects they generate.

The Measurement of Total Factor Productivity (TFP)

It is our contention that the direct measurement of TFP and externalities or spill over effects due FDI inward or outward stocks provide a more incisive measure of externalities than that provided by the use of GDP growth as in most empirical studies undertaken on the subject to date. The measurement of TFP poses formidable challenges and much of the neoclassical growth literature use growth accounting to obtain TFP as a residual from by rearranging components of a Cobb-Douglas, Translog of CES production function. The 'Solow residual' obtain from the Cobb-Douglas production function (Solow, 1956) is used to measure TFP and some critics regard it as an "an index of ignorance" although Solow popularised this as a measure of the unobserved component as a measure of TFP or exogenous technological progress. In this study, we break new ground by measuring TFP using a multiplicatively complete index number to measure TFP. A multiplicatively complete index number enables the decomposition of measures of TFP into components of technical change and several measures of technical efficiency as hypothesised by (O'Donell CJ., 2009, O'Donell, 2008). In this study, we argue that these components provide proxy measures of technological spill over associated with FDI cross-border flows.

The methodology used in this study to measure TFP assumes that TFP resulting FDI flows into a country in period t is a ratio of aggregate output (Q_t) to aggregate input (X_t) defined by:

$$TFP_t = Q_t / X_t \qquad (1)$$

The by computing the ratio defined below TFP growth from period 0 to period t for a given country in terms of an index number:

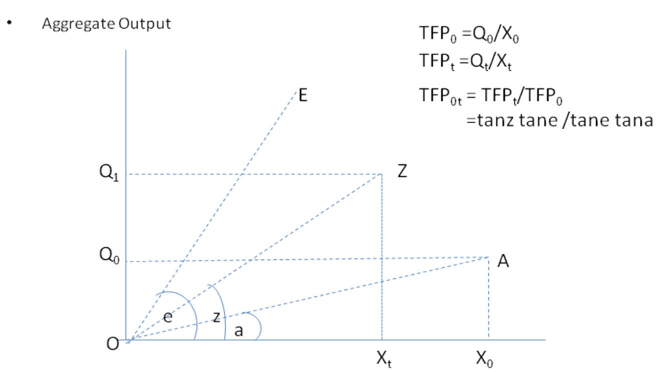
$$TFP_{ot} = Q_{ot} / X_{ot} \qquad (2)$$

The TFP index number defined above satisfies the properties of *multiplicative completeness* and therefore lends itself to decomposition to components of technical change ((O'Donell CJ., 2009). The components can be used to measure important technological spill over effects generated by FDI flows that have eluded rigorous quantification so far. The decomposition of the TFP index into input-oriented components of technical change can be explained following O'Donnell, in Figure 1 in the input-output or X-Q space. In the Figure the change in TFP from period 0 and period t is depicted by a change in the slopes of the rays that pass through the origin at point A and Z, shown by the angles and marked by the lower case letters a and z . The index that measures the change in TFP between period 0 and 1 for a given country can be defined by the ratio of the angles or the tangents as shown below, where tane represents TFP at some non-negative point E on the X-Q space:

$$TFP_{ot} = (tanz/tane) /(tane/tana) \qquad (3)$$

The equation (3) demonstrates that an index of TFP that can be expressed in terms of ratios of output and input changes can be decomposed into several input-oriented decompositions that also double up measures of spill over effects. The input-oriented decomposition measures have also output oriented counterparts, which have similar interpretation and meaning.

Figure 1. Measuring and Decomposing TFP change



Movements from point A to a point E in Figure 1 measures TFP efficiency (TEFP) or the gap between technology used by a country and the best practice technology frontier or maximum potential TFP that that is available in period o and defined by TFPo*. The measure of TFP efficiency, which can be factorized into different input-oriented components as shown below:

$$TFPE_o = TFP_o / TFP_o^* = ITE_o \times ISE_o \times RME_o \quad (4)$$ where,

ITE: *Input–oriented technical efficiency* = the difference between observed TFP and the maximum possible TFP given fixed input-mix, output-mix and output levels.

ISE: *Input –oriented scale efficiency* = difference between TFP at a technically efficient point and the maximum possible TFP while letting output vary given fixed input and output mixes.

Residual Mix Efficiency (RME) = difference between TFP at a point on a mix restricted frontier and the maximum TFP possible when input and output mixes and levels) are variable.

A measure of TFP efficiency for period 1 or TFPE1 can be decomposed in a manner analogous to that given in equation (4) and the ratio of the two decompositions enables the specification of a multiplicatively complete index of TFP change between period o and 1 as shown below:

$$TFP_{ot} = TFP_t / TFP_o = [TFP_t/TFP_o^*] \times [\, ITE_t/ITE_o \times ISE_t/ISE_o \times RME_t/RME_o \,] \quad (5)$$

In equation (5) the first term within parenthesis on the right hand side measures technical change and is given by the ratio of the difference between the maximum potential TFP that can be generated using technology available in period t and the period o, respectively. The other ratios measure technical efficiency change, scale efficiency change and residual mix that occur between period o and t. The input oriented measures of technical change have output-oriented counterparts that have similar interpretations. The DPIN Software based on non-parametric data envelope analysis (DEA) written by (O'Donell CJ., 2009) has been used in this study to decompose the multiplicatively complete using the Moorsteen-Bjurek TFP index and the results are reported in Table 3. Several other index numbers satisfy the properties of multiplicative completeness that facilitates the decomposition of TFP changes based in meaningful components of technical change and technical efficiency that also can be interpreted as spillover effect measures. The other index numbers that satisfy the properties of multiplicative completeness include, Laspeyres, Paasche, Fisher Ideal, Tornquist, Hicks-Moorsteen indexes. However, it is noteworthy that widely used Malmquist index popularized by(Caves, 1982) fails to satisfy the properties of multiplicative completeness and therefore cannot be used in the analysis of spillover effects due to technological change caused by FDI flows. The DPIN software also provides estimate of the decomposition of both input and output oriented technical, scale and mix-efficiency and also measures of components of TFP change are reported in Table 3 and Table 4 respectively and are given below:

Table 3: Measures of technical, scale & mix efficiency

Year	Obs		Country	Scores					
t	i	n		OTE	OSE	OME	ITE	ISE	IME
1982	26	1	Australia	0.71	1	1	0.71	1	0.73
1982	29	4	Canada	0.64	1	1	0.64	1	0.59
1982	42	17	NZ	0.49	1	1	0.49	1	0.61
1982	49	24	UK	0.53	1	1	0.53	1	0.51
1982	50	25	USA	0.65	1	1	0.65	1	0.62
1992	276	1	Australia	0.41	1	1	0.41	1	0.89
1992	279	4	Canada	0.29	1	1	0.29	1	0.77
1992	292	17	NZ	0.58	1	1	0.58	1	0.94
1992	299	24	UK	0.47	1	1	0.47	1	0.99
1992	300	25	USA	0.6	1	1	0.6	1	0.94
2002	526	1	Australia	0.32	1	1	0.32	1	0.89
2002	529	4	Canada	0.24	1	1	0.24	1	0.75
2002	542	17	New Zealand	0.53	1	1	0.53	1	0.98
2002	549	24	UK	0.6	1	1	0.6	1	1
2002	550	25	USA	0.59	1	1	0.59	1	0.96
2007	651	1	Australia	0.02	1	1	0.02	1	0.56
2007	654	4	Canada	0.02	1	1	0.02	1	0.31
2007	667	17	NZ	0.02	1	1	0.02	1	0.83
2007	674	24	UK	0.02	1	1	0.02	1	0.92

Table 4: Decomposition of changes in tfp spillover effects

Year t	Obs l	N	Country	TFP score	dTech y	dEff	dOTE	dOSE	dOME
1982	26	1	Australia	1	1	1	1	1	1
1982	29	4	Canada	0.87	1	0.87	0.84	1	1
1982	42	17	NZ	0.65	1	0.65	0.64	1	1
1982	49	24	UK	0.66	1	0.66	0.53	1	1
1982	50	25	USA	0.74	1	0.74	0.73	1	1
1992	276	1	Australia	1	1	1	1	1	1
1992	279	4	Canada	1.1	1	1.1	1.1	1	1
1992	292	17	NZ	1.06	1	1.06	1.06	1	1
1992	299	24	UK	0.97	1	0.97	0.97	1	1
1992	300	25	USA	1.09	1	1.09	1.09	1	1
2002	526	1	Australia	0.95	1	0.95	0.92	1	1
2002	529	4	Canada	0.93	1	0.93	0.92	1	1
2002	542	17	New Zealand	1.1	1	1.09	1.1	1	1
2002	549	24	UK	1.06	1	1.06	1.03	1	1
2002	550	25	USA	0.95	1	0.95	0.92	1	1
2007	651	1	Australia	1	1	1	1	1	1
2007	654	4	Canada	0.94	1	0.94	0.94	1	1
2007	667	17	N Z	0.92	1	0.92	0.92	1	1
2007	674	24	UK	0.81	1	0.81	0.81	1	1
2007	675	25	USA	0.89	1	0.89	0.89	1	1

Panel data econometrics

Panel data econometrics used in this paper incorporate unit root and co-integration tests that overcomes the bias and inconsistency problems vitiating OLS estimators computed from pooled cross-section time-series data by addressing a number of limitations by: i. The identification of parameters of crucial FDI-TFP relationships without imposing too many restrictive assumptions. ii The computation of more efficient estimators than those provided by pure time-series or cross-section datasets or any combination of them using the same sample size (Njman and Verbeek 1990).iii. Providing insights on the ' true state dependence' and 'spurious state dependence' based on history of individual observations(Heckman, 1978). iv. Reducing the bias due to omitted variables that arises due to the undermining of the assumption that explanatory variables are uncorrelated with the error term (Mundlak, 1961) v. Identifying valid internal instruments for regression that are affected by measurement error, where the transformed original variable transformed into a variable that is correlated with explanatory variables in the model but uncorrelated with the error term. The advantages of panel data econometrics are also critically surveyed by (Hsiao, 2003) and (Baltagi, 2005) and others.

Panel unit root tests

Panel unit root tests are the multiple series analogue of unit root tests of a Univar ate series. Panel unit root tests than their Univar ate counterparts. The panel unit root tests can be classified based on restrictions on the autoregressive process across cross-sections or series. If the AR(1) process for panel data is given by :

$$y_{it} = \rho_i y_{it-1} + X_{it}\delta_i + \epsilon_{it}$$

We report in this paper the unit root tests due to(Levin, 2002) or LLC , (Im, 2003) or IPS which are panel unit root analogues of the Phillips-Perron (PP) and Augmented Dickey Fuller (ADF) tests . We also report the results for the Hadri test (Hadri, 2000) which tests the null of stationary against the alternative in a panel setting in a manner analogous to the KPSS test in the univariate case. Furthermore, the Maddala and Wu (1999) MWa panel unit root test is based on the combination of the p-values of i cross-section unit root tests using a Fisher (1932) index. Here i= 1....N, cross-sections and pi are the p-value of the I - th cross-section. The resulting non-parametric MW tests could be computed using the Augmented Dickey Fuller (ADF) or Phillips-Perron (PP) statistic which defined by P (*y*) =- $2\sum_{i=1}^{N}\log($ pi) ~ x^2 (2^{Nd}.f). A detailed description of these statistics is given in the EVIEWS 7.1Manual.

Panel co-integration tests

Panel co-integration tests estimate the long-run equilibrium relationship between the TFP and FDI variables of interest. The Engle-Granger

Representation theorem (Engle and Granger 1987) postulates if the variables of interest are integrated order one I(1) and if the residuals of the regression which specifies a linear combination of the variables of interest are stationary or I(0) , then the variables of interest are co-integrated.

The methodology enunciated by (Pedroni, 1999) is invoked to implement co-integration tests or tests for long-run equilibrium relationships among the major variables linking total factor productivity and FDI and other major economic variab.es.. The Pedroni methodology which is analogous to follows the Engle-Granger two-step procedure in the univariate case, allows for the testing for the presence of heterogeneous slope coefficients, fixed effects and individual specific deterministic trends in the co-integration equation (1) as exemplified below:

$$y_{it} = \alpha_i + \sum_{j=1}^{m} \beta_{jt}\, x_{jt} + \varepsilon_{it} \qquad (1)$$

$t = 1, \ldots T$ (number of observations); $i = 1, \ldots N$(number of countries); $m = 1, \ldots M$

α_i : intercepts or fixed efects terms , $\beta_{1i}, \ldots, \beta_{mi}$: m slope coefficients.

$\delta_i t$: deterministic time trendss.

Where the residuals estimated from the panel regression equation (1) follows the AR-process given in equation (2), where testing for co-integration is a test of whether the null-hypothesis Ho: p_i=1 for all i in the equation (2) below:

$$\varepsilon_{it} = \rho_i \varepsilon_{i,t-1} + \varsigma_{it} \qquad (2)$$

Pedroni formulates seven statistics based on the residuals of the co-integration regression above.. The asymptotic distributions derived from these panel co-integration are used to derive critical values for the co-integration test statistics under standardizations , based on the moments of Brownian motion functions, which are distributed standard normal (Pedroni 1999: 660-661). The seven statistics formulated by Pedroni to test the null of no co-integration in heterogeneous panels are classified into four "within-dimension" panel tests and three "between-dimension" group tests. The within-dimension tests take into account common time factors and allow for heterogeneity across countries. The between-dimension tests are group mean tests that take into account of heterogeneity of parameters across countries.

Granger causality tests

In order to test for the direction of causality between TFP and FDI variables we first estimate the variants of the panel co-integration equation (1) by applying the methodology of based on the Engle-Granger residual method as to panel data by Pedroni (2001). The estimated equations only reveal the existence or not of co-integrating relationships among the variables of interest. In order to determine the direction of causality between TFP and FDI we estimate bivariate Granger causality tests by imposing restrictions on coefficients defined in the set of equations (3) below:

$$\Delta(TFP_{it}) = \alpha_i + \sum_{k=1}^{p} \beta_{11}\,\Delta LOG(FDII_{it-k}) + \sum_{k=1}^{p} \beta_{12}\,\Delta LOG(FDIO_{it-k}) + \varepsilon 1_{it})$$

$$\Delta LOG(FDII_{it}) = \alpha_i + \sum_{k=1}^{p} \beta_{11}\,\Delta(TFP_{it-k}) + \sum_{k=1}^{p} \beta_{12}\,\Delta LOG(FDIO_{it-k}) + \varepsilon 2_{it})$$

$$\Delta LOG(FDIO_{it}) = \alpha_i + \sum_{k=1}^{p} \beta_{11}\,\Delta LOG(FDII_{it-k}) + \sum_{k=1}^{p} \beta_{12}\,\Delta(TFP_{it-k}) + \varepsilon 3_{it})$$

(3)

The symbol **Δ** refers to the difference operator and k=1,..p refers to lag length based on Schwartz Information Criterion (SIC). The null-hypothesis of FDII not Granger causing TFP and the reverse causality null are tested by imposing restrictions and testing for the joint null-hypothesis Ho: $\sum_{k=1}^{p} \beta_{11} = 0 \;\; for \;\forall\; i \; and \; k, \beta_{16} = 0$ using an F-test with the appropriate d.f.

Next, we describe the theory underpinning the empirical validation of a model describing the nexus between TFP and FDI and other macro-economic explanatory variables and control variables identified in the literature review as important influences that impinge on the TFP-FDI dynamics of the panel dataset under study in this paper.

Before, empirically validating the fully-fledged model we carry out the Hausman (1978) test to determine whether the model is best described by a Fixed Effect (FE) or Random Effect (RE) model. We can specify the static linear Fixed Effects model that explains the TFP of country i in year t given by yit as a linear regression framework. Where the intercept term α_i proxies the country specific or idiosyncratic fixed effects and the k explanatory variables and control variables (as detailed in Table 5 below) are defined by x_{it} and u_{it} the independently, identically distributed stochastic disturbance term with zero mean and constant variance as specified in (1) below:

$$y_{it} = \alpha_i + x'_{it}\beta + \mu_{it}, \quad \mu_{it} \sim IID\left(0, \sigma_\mu^2\right) \qquad (4)$$

The above equation could be re-written as OLS regression with dummy variables d_{ij}=1 if i=j or 0 otherwise, representing the idiosyncratic fixed effects ith- country described by the intercept term in (1), giving:

$$y_{it} = \sum_{j=1}^{N} \alpha_j \, d_{ij} + x'_{it}\beta + \mu_{it}, \qquad (6)$$

The estimates of the coefficients of the dummy variables d and the explanatory variables β can be obtained as the Least Squares Dummy Variable (LSDV) estimator by applying OLS method to equation (2). However, a less complicated method of obtaining the same estimates is through the application of OLS to after transforming equation (1) into the demeaned or mean, deviation. This transformation produces observations that deviations from individual means and eliminates the fixed effects or the intercept term α_I. This transformation based on observations that deviate from the means is also referred to as the within transformation and the OLS estimator of β obtained from is defined as the within estimator or fixed effects estimator is $\tilde{\beta}\ FE$. It is an unbiased and consistent estimator of β when the requirements for the FE model are satisfied. That is i. First, the explanatory variables xit should be uncorrelated with the idiosyncratic disturbance term x_{it} .ii. Second, the explanatory variables, if strictly exogenous, should be independent of the past, current and future values of the idiosyncratic disturbance term.iii. Third, the error term should be homoscedastic.

The degrees of freedom (df) correction for obtaining the fixed effects estimator by applying pooled OLS to the time demeaned version of equation (1) we are dealing with a total of NT observations and k independent variables. For each cross-section or country i, we lose 1 df because of time-demeaning. Therefore, the appropriate df that should be used in tests of significance is NT – N –k = N(T-1)-k.

The focus in the FE model is on the differences 'within' individual countries, i.e. it explains to what extent yit differs from the mean of each country, but it does not explain why the mean of y differs across countries. The FE regression parameters explain effects that are identified only through the within dimension of the data

The Random Effects (RE) Model

In regression analysis it is assumed that all the factors that affect the dependent variable that have been exclude are incorporated in the error term. This leads to the assumption that α_i are random factors that are i.i.d. over individual countries and enables the specification of the RE model as follows:

$$y_{it} = x_{it}^{'}\beta + \alpha_i + \mu_{it}\ , \quad \alpha_i \sim IID(0, \sigma_\alpha^2)\ , \mu_{it} \sim IID(0, \sigma_\mu^2) \qquad (7)$$

Where $\alpha_i + \mu_{it}$ is a composite error term comprising of an individual country specific component that a time-invariant component that is uncorrelated over time. Therefore, all the correlation over time is associated with the country specific effect α_i . Furthermore, since ai and uit are mutually independent of x_{it}, the OLS estimates of the β parameters in (8) are unbiased and consistent. The composite error exhibits is subject to a particular form of autocorrelation and therefore estimators that are more efficient can be obtained by exploiting the structure of the error covariance matrix to obtain more GLS estimators of the regression parameters. The GLS transformation is captured in a parameter λ that eliminates the serial correlation as described by complex matrix algebra (Wooldridge 1999, Chapter 10). The OLS pooled estimator is obtained when λ =0 and the fixed effects (FE) estimator is obtained when λ= 1. When the estimated λ is closer t unity he random effects (RE) model provides a more appropriate estimator than the FE model set out in the equations below:

$$\Delta(TFP_{it}) = \alpha_i + \sum_{k=1}^{p} \beta_{11}\, \Delta LOG(FDII_{it-k}) + \sum_{k=1}^{p} \beta_{12}\, \Delta LOG(FDIO_{it-k}) + \varepsilon 1_{it})$$
$$\Delta LOG(FDII_{it}) = \alpha_i + \sum_{k=1}^{p} \beta_{11}\, \Delta(TFP_{it-k}) + \sum_{k=1}^{p} \beta_{12}\, \Delta LOG(FDIO_{it-k}) + \varepsilon 2_{it}) \qquad (8)$$
$$\Delta LOG(FDIO_{it}) = \alpha_i + \sum_{k=1}^{p} \beta_{11}\, \Delta LOG(FDII_{it-k}) + \sum_{k=1}^{p} \beta_{12}\, \Delta(TFP_{it-k}) + \varepsilon 3_{it})$$

The symbol **Δ** refers to the difference operator and k=1,..p refers to lag length based on Schwartz Information Criterion (SIC). The null-hypothesis of FDII not Granger causing TFP and the reverse causality null are tested by imposing restrictions and testing for the joint null-hypothesis Ho: $\sum_{k=1}^{p} \beta_{11} = 0 \ for \ \forall \ i \ and \ k, \beta_{16} = 0$ using an F-test with the appropriate degree freedom.

Empirical results

The empirical results reported in this study are based on annual data from a sample of 25 OECD countries and aims to explain the total factor productivity (TFP) growth effect due to FDI inflows, FDI outflows estimated using the panel data econometrics as outlined in Section 3. We use FDI stocks rather than FDI flows, because stocks, due to accumulation of flows, capture the long run effects better than flows (Bitzer J and Gorg H., 2009).

Table 5: Panel data modelling variables & data sources

Variable	Description	Source
$\Delta LOG(TFP_{it})$	Growth of TFP index	Database
$LOG(GDP_{it})$	GDP at constant 1990 prices & exchange rates	WDI
$LOG(GDPPC_{it})$	GDP per capita at constant 1990 prices & exchange rates	Database
$\Delta LOG(FDII_{it})$	Stock of Inward FDI	WDI
$\Delta LOG(FDIO_{it})$	Stock of outward FDI	WDI
$\Delta LOG(OPEN_{it})$	Trade in goods & non-factor services as a percent of GDP	WDI
$\Delta LOG(GERD_{it})$	Government expenditure on R&D	OECD Statistics
$INFL_{it}$	Inflation measured by the change in the implicit price deflator	WDI
$\Delta LOG(GOVX_{it})$	Government expenditure	WDI
$\Delta LOG(CAPF_{it})$	Stock measure of capital formation	WDI
$\Delta LOG(DEFL_{it})$	GDP or the Implicit Price Deflator	WDI
$\Delta(1\text{-}1/LOG(EMP_{it}))$	Business Cycle Effect, EMPit : Total Annual Hours Worked	PWT 6.2

CON_IDENTITY	Country identifier	Database
YEAR	Time identifier	Database

Notes: **Δ**: first difference operator. i = 1,....N (Countries), t =1,.....T (Years).
ΔLOG (Variable) = Growth rate of the variable.
Sources: WDI – World Development Indicators, UNCTAD Handbook of Statistics 2009
PWT – Penn World, Table 6.2: The Conference Board Total Economy Database.
Relates to the Database: See Appendix

In the empirical investigation, we test whether the major variables of interest relating to FDI inflows and outflows exhibit a long-run equilibrium or are co-integrated. Descriptive statistics on these variables or interest are reported in Table 6 below. Second, the results of the panel unit root tests on the major variables that govern the TFP-FDI nexus are reported in Table 7. Third, the results of Pedroni's heterogeneous panel co-integration tests to determine whether co-integration or a long-run equilibrium relationship between TFP and FDI inflow and outflow variables, are reported in Table 8. Fourth, in order to determine the direction of causality from TFP to FDI flows, thereby shedding light on whether the crowding-out or crowding in hypothesis is supported or not is reported in Table 9. Fifth, the tests on whether the fixed versus random effects models are presented in Table 10.. Thereafter, the results of the empirical validation of a fully-fledged model with several explanatory and control variables that govern the nexus between TFP and FDI for the panel of OECD countries is presented in Table 11.

Table 6: Descriptive statistics on tfp- fdi variables of interest

	(DTFP)	**Δ**LOG (FDII)	**Δ**LOG (FDIO)	**Δ**LOG (OPEN)	**Δ**LOG (GERD)	**Δ**LOG (CAPF)
Mean	0.008191	0.006988	0.006118	5.88E-05	0.002199	0.003221
Median	-0.001960	-0.158858	0.275549	0.000000	0.470267	0.064484
Maximum	4.860258	6.965840	5.502585	1.917710	8.088514	4.491951
Minimum	-4.908558	-5.307135	-6.569557	-1.402750	-8.786252	-5.722499
Std. Dev.	0.621428	1.992358	2.543926	0.667126	2.392626	2.088444
Skewness	0.096557	0.582428	0.001057	0.292247	-0.503612	-0.487793
Kurtosis	29.12507	4.029327	2.437156	2.648096	2.942057	2.975804

Jarque-Bera	17774.91	62.92723	8.249952	12.12158	26.50674	24.80092
Probability	0.000000	0.000000	0.016164	0.002333	0.000002	0.000004
Sum	5.119607	4.367785	3.824007	0.036725	1.374181	2.013237
Sum Sq. Dev.	240.9717	2476.962	4038.254	277.7157	3572.186	2721.637
Observations	625	625	625	625	625	625

The panel unit root tests were performed on the main variables of interest that link FDI inwards (FDII) and outward (FDIO) stocks and total factor productivity (TFP). The panel unit root tests on the levels of the variables reported in Table 6 indicate that the p-values of the variables exceed 0.05 and therefore the null hypothesis of a unit root is not rejected and all the variables integrated order one or I(1). On the basis of the Levin et al. t-test ((Levin, 2002), the panel Fisher ADF and the Panel Fisher PP tests due to (Maddala, 1999).. While for the panel tests(Hadri, 2000) which reverses the null and alternative hypothesis like the KPSS test in the univariate the results reported in Table 7 reject the null of I(0) or stationerity in favor of the unit root alternative while the tests of the first difference form of the variable support the null of I(0) and reject the alternative of I(1) or non-stationarity. Therefore, the tests all reveal that all the variables or interest are integrated order or I(1) and their linear combinations could be co-integrated as hypothesized by the Engle-Granger representation theorem (Engle, 1987).

Table 7: Panel unit root tests

Variable	LOG(FDII)			LOG(FDIO)		
Level	Statistic	p-value	Order I	Statistic	p-value	Order I
Levin, Lin & Chu t*	-0.28	0.39	I(1)	-0.73	0.23	I(1)
ADF - Fisher Chi-sq.	22.19	1.00	I(1)	24.47	1.00	I(1)
PP - Fisher Chi-sq.	24.78	1.00	I(1)	29.36	0.99	I(1)
Hadri Z-stat	2.02	0.02	I(0)	1.85	0.03	I(0)

Het consistent Z	1.77	0.04	I(0)	1.77	0.04	I(0)
First difference	ΔLOGF-DII)	p-value	Order I	ΔLOG (FDIO)	p-value	Order I
Levin, Lin & Chu t*	-33.18	0.00	I(0)	-33.02	0.00	I(0)
ADF - Fisher Chi-sq.	678.59	0.00	I(0)	687.10	0.00	I(0)
PP - Fisher Chi-sq.	832.29	0.00	I(0)	824.10	0.00	I(0)
Hadri Z-stat	6.64	0.00	I(0)	7.46	0.00	I(0)
Het Con Z	5.82	0.00	I(0)	7.34	0.00	I(0)

Explanatory Notes:
Null: Unit root (assumes common unit root process) for the Levin, Lin & Chu t-test
Null: Unit root (assumes individual unit root process for the ADF-Fisher & PP-Fisher tests
Automatic lag length selection based on SIC: 0 to 4 on SIC
Newey-West automatic bandwidth selection and Bartlett kernel
Fisher Tests: Probabilities computed assuming asymptotic Chi-square distribution and all other
Hadri Tests: High autocorrelation leads to severe size distortions and over-region of the null.

Next, the Pedroni methodology to test the null of no co-integration in dynamic heterogeneous panels with multiple regressors is implemented for FDI-TFP series of interest ((Pedroni, 1999, Pedroni, 2001, Pedroni, 2004). The test results provide insights on the heterogeneity among individual countries on the relationships based on the panel data both in the long run and in the short-run as shown by co-integrating vectors with significant error correction mechanism.

In conventional time-series analysis co-integration occurs when a linear combination of variables that are individually integrated or order one i.e. I (1) are stationary or I(0). The vector of slope coefficients in the linear combinations defines the co-integrating vector. Panel of co-integration tests overcomes the problem of low power when applied to series of moderate length.

Scientific Papers (www.scientificpapers.org)
Journal of Knowledge Management, Economics and Information Technology

Pooling the panel data across individual countries is designed to overcome the lower power of tests when sample size is small by making available more information available through the panel approach. Recall that this issue was discussed in Section 4.

The Pedroni methodology offers seven different statistics, four of which are known as the panel tests are based on the pooling the residuals in estimating the regression along the within-dimension. The other three tests are known as group panel tests based on the pooling the residuals of the regression along the between-dimension. The within-dimension or panel tests, takes into account common time factors and allows for heterogeneity across countries. While the between-dimension or group means co-integration tests, allow for heterogeneity of parameters across countries. These seven panel co-integration and the critical values based on Monte Carlo simulations discussed in (Pedroni, 1999).

The results of the Panel unit root tests based on the Pedroni methodology are reported in Table 8 below:

Table 8: Pedroni residual cointegration tests

<table>
<tr><td colspan="5">Major Series of interest: ΔΔTFP , ΔLOG(FDII) ,ΔLOG(FDIO)</td></tr>
<tr><td colspan="2">Null Hypothesis:</td><td>No co-integration</td><td colspan="2">Included observations: 650</td></tr>
<tr><td colspan="5">Trend assumption: Deterministic intercept and trend</td></tr>
<tr><td colspan="5">Automatic lag length selection based on SIC with a max lag of 4</td></tr>
<tr><td colspan="5">Newey-West automatic bandwidth selection and Bartlett kernel</td></tr>
<tr><td colspan="5">Alternative hypothesis: common AR coef. (within-dimension)</td></tr>
<tr><td>Panel tests</td><td>Statis-tic</td><td>p-val.</td><td>Statistic</td><td>p-val.</td></tr>
<tr><td>Panel v-Statistic</td><td>-6.484</td><td>1</td><td>-5.745</td><td>1</td></tr>
<tr><td>Panel rho-Statistic</td><td>-7.467</td><td>0</td><td>-5.406</td><td>0</td></tr>
<tr><td>Panel PP-Statistic</td><td>-14.68</td><td>0</td><td>-14.35</td><td>0</td></tr>
<tr><td>Panel ADF-Statistic</td><td>-14.69</td><td>0</td><td>-13.93</td><td>0</td></tr>
<tr><td colspan="5">Alternative hypothesis: individual AR coef. (between-dimension)</td></tr>
<tr><td colspan="2">Group tests</td><td colspan="2">Statistic</td><td>p-val.</td></tr>
<tr><td colspan="2">Group rho-Statistic</td><td colspan="2">-2.763</td><td>0.0029</td></tr>
<tr><td colspan="2">Group PP-Statistic</td><td colspan="2">-15.52</td><td>0</td></tr>
<tr><td colspan="2">Group ADF-Statistic</td><td colspan="2">-15.02</td><td>0</td></tr>
</table>

Pedroni co-integration tests support the rejection of the null of no co-integration for 9 out the 11 estimated panel co-integration tests that tests the growth rate of productivity (DTFP), foreign direct investment in flow (FDII) and outflows (FDIO). The within-dimension individual panel unit root tests reported in the Panel v-Statistic rejects the null of no co-integration. While all the between-dimension group statistic tests rejects the null hypothesis of no co-integration. Therefore, the Pedroni heterogeneous panel co-integration tests provide support for the hypothesis that the growth of total factor productivity and foreign direct investment inflows and outflows are co-integrated or exhibit a long-run equilibrium relationship.

However, the above tests fail to provide information on the direction of causation. This issue is tackled by the bivariate Granger causality tests the results of which are reported in Table 9 and the results indicate that the growth of foreign direct investment inflows cause increase total factor productivity and growth in total factor productivity in turn increases foreign direct investment inflows, thereby indicating the existence of bi-directional causality between foreign direct investment inflow (FDII) and growth of total factor productivity (TFP) causality. The bi-directional causality test results lend support to the crowding-in hypothesis that FDI inflows and outflows by increasing TFP that has the potential to generate positive externalities. However, FDI - inflows do not appear to Granger cause FDI-outflows and there was no evidence here to support bi-directional causality These results, nevertheless provide support for the crowding-output hypothesis and imply that FDI outflows support the crowding out hypothesis which has the potential to generate negative externalities through its adverse effects on domestic firms. The bivariate Granger causality tests are reported in Table 9.

Table 9: Pairwise granger causality tests

Sample: 1982 2007		Lags: 2	
Null Hypothesis:	Obs	F-Stat	Prob.
DLOG(FDII) does not Granger Cause DTFP	575	0.0945	0.9098
DTFP does not Granger Cause DLOG(FDII)		0.0597	0.942
DLOG(FDIO) does not Granger Cause DTFP	575	0.5104	0.6006
DTFP does not Granger Cause DLOG(FDIO)		0.3856	0.6802
DLOG(FDIO) does not Granger Cause DLOG(FDII)	575	7.9405	0.0004

DLOG(FDII) does not Granger Cause DLOG(FDIO)		18.806	0.0000

Further empirical results based on FGLS estimate of equation

The empirical results reported in this study are based on annual data from a sample of 25 OECD countries and aims to explain the total factor productivity (TFP) growth effect due to FDI inflows, FDI outflows, openness of the economy to international trade, government expenditure on R&D, capital formation after controlling for the effects of government expenditure, inflation and business cycle effects that reverberate through unemployment.

The empirical analysis has been performed by validating a cross-country panel time-series regression model specified in equation (1) has been empirically validated for a sample of 25 OECD countries to explain the spillover effects due TFP resulting from the effects of FDI inward stocks and outward stocks, technology transfer effects after controlling for key policy and structural effects as explained below:

$$\Delta TFPit = \alpha_i + \beta_1 \Delta FDII_{it} + \beta_2 \Delta FDIO_{it} + \beta_3 \Delta OPEN_{it} + \beta_4 \Delta GERD_{it} + \beta_5 \Delta CAPF_{it} + \beta_7 \Delta GOVX_{it} + \beta_8 \Delta NFL_{it} + \beta_9 (1\text{-}1/\Delta EMP_{it}) + u_{it} \qquad (3)$$

Where,

$y_{it} = \Delta TFP_{it}$, x_{it} = ($\Delta FDII_{it}$, $\Delta FDIO_{it}$ $\Delta OPEN_{it}$, $4\Delta GERD_{it}$, $\Delta CAPF_{it}$,$\Delta GOVX_{it}$, $\Delta INFL_{it}$, ($1\text{-}1/\Delta EMP_{it}$)). $i = 1,..N$, $t = 1,...T$.

All the variables notated with **Δ** estimate growth rates using the log difference of the variable for the country i in year t. The explanatory variables are: TFP: Total Factor Productivity, FDII: FDI inward stocks, FDIO: FDI outward stocks, OPEN: Openness to trade, GERD: R&D expenditure, CAPF: Capital Formation and the control variables are: GOVX: Government Expenditure, INFL: Inflation, UNEMP: Unemployment, the intercept term α_i: country-specific fixed effect, u_{it}: idiosyncratic error. Since the sample of OECD countries is assumed to have attained the same threshold level of development no proxies have been included to capture any institutional variations among the countries. In the empirical validation we have assumed that country-specific fixed effects are a more crucial determinant in account for variation of TFP spillover effects and GDP growth effects due FDI flows as hypothesized by Nath (2009) rather than the time invariant initial conditions as are proxies by GDP per capita (GDPPC) or the Barro-effect in the convergence theory postulated by Barro and Xala-i-Martin (1995).

Table 5 summarizes the definitions of the variables and data-sources used in the empirical validation of the panel data TFP and FDI spillover effects model for the OECD countries investigated in this study.

The regression results from the 9 sets of regressions using feasible GLS estimation with cross-country weights are reported in Table 6. Regression models referred in column (1) to (6) uses time-invariant GDP per capita (GDPPC) or the Barro effect, the results reported for regression models in columns ((7) to (9) are based on cross-country specific fixed effects model. The standard errors have been estimated using White's hetero-scedasticity consistent-variance covariance estimates that are robust to general hetero-scedasticity. The regression models estimated with the time-invariant initial conditions (or Barro-effect) do not provide efficient estimators. But the regression models for cross-country specific effect models provide efficient estimators and therefore we focus mainly on these results for analyzing the TFP spillover effects due to FDI inward and outward stocks. Regression equation (7) includes inward FDI (FDII) but excludes the outward FDI (FDIO), while equation (8) includes FDIO but excludes FDII. Equation (9) includes both inward and outward FDI stocks. The regression coefficients for FDII and FDIO have positive and significant impacts on the TFP growth variable. The results from equation (9) are undermined by the multi-collinearity between growth rates of FDII and FDIO. The value for the growth of FDII is 0.01 implying that 1% increase in growth of FDI inward stock results in growth of TFP by 0.01 percent. The coefficient of FDIO or growth of outward stock of FDI is also around 0.01 and is significant. Besides, R&D (GERD), capital formation (CAPF) also have, positive effects on growth TFP as expected.

The control variables relating to policy proxies by government expenditure (GOVX) , inflation (INFL) and business cycle effects due to unemployment (1-1/EMP) all have negative effects on TFP growth as expected. The interaction term is not statistically significant and the regression results fail the residual test. Given that the sample of countries have attained the same threshold level of absorptive capacity)

It is noteworthy that empirical results for the TFP spillover effects and FDI inward and outward stocks and other explanatory and control variables are consistent with results reported for cross-section time-series studies for other countries (Borensztein, 1998) (Ghosh, 2009, van Pottelsberghe, 2001).

Table 10: Tests for pool, redundatnt fixed effects, and hausaman random effects.

DEP VAR LOG(DTFP)		METHOD:	PANEL LS	
SAMPLE ADJ 1983-2007	Periods 25	Cross 25	Panel 625	
Variable	Coeffi-cient	Std. Error	t-Statistic	Prob.
C	0.0040	0.0239	0.1656	0.8685
DLOG(FDII)	0.0129	0.0270	0.4799	0.6315
DLOG(FDIO)	-0.0057	0.0173	-0.3275	0.7434
DLOG(OPEN)	0.0174	0.0551	0.3149	0.7529
DLOG(GERD)	0.0020	0.0117	0.1701	0.8650
DLOG(CAPF)	0.0250	0.0568	0.4408	0.6595
DLOG(GOVX)	-0.0272	0.0550	-0.4955	0.6204
INFL	0.0002	0.0007	0.3724	0.7097
DLOG(1-1/EMP)	-1.5840	18.2916	-0.0866	0.9310
DLOG(FDII)*DLOG(GERD)	-0.0064	0.0062	-1.0300	0.3034
R-squared	0.0026	Mean dependent var		0.0107
Adjusted R-squared	-0.0122	S.D. dependent var		0.5584
F-statistic	0.1780	Durbin-Watson stat		1.2319
Prob(F-statistic)	0.9963			
Redundant Fixed Effects Tests				
Effects Test	Statistic	d.f.	Prob.	
Cross-section F	1.0482	-24557.0000	0.4010	
Cross-section Chi-square	27.1676	24.0000	0.2967	
Period F	0.5632	-24557.0000	0.9548	
Period Chi-square	14.7448	24.0000	0.9280	
Cross-Section/Period F	0.7914	-48557.0000	0.8421	
Cross-Section/Period Chi-square	40.5729	48.0000	0.7679	
Effects Specification			S.D.	Rho
Cross-section random			0.0000	0.0000

Idiosyncratic random		0.5613	1.0000
Correlated Random Effects - Hausman Test			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	14.7784	9.0000	0.0972

The LS estimates of the pooled cross-section time-series effects reported in Table 8 above indicate that the neither the intercept term (C) nor the explanatory variables are statistically significant as the p values exceed 0.30. The result that the intercept term or country specific fixed effects are the same for all countries is both intuitively and statistically inappropriate. Therefore, the Likelihood Ratio test for redundant fixed effects is performed and the results indicate that the Chi-squared and F-test version for restricting i. The cross-section fixed effects to zero. ii. The period fixed effects to zero. iii. Both cross-section and period effects to zero are not rejected as the associated p-values exceed 0.29. Therefore, the pooled sample is not rejected. Nevertheless, additional insights on the DGP are provided by testing for the significance of random effects of countries (cross-sections) but not periods (time). Furthermore, the results of the Hausman test for testing the null-hypothesis that the random effects are uncorrelated with the explanatory variables indicate that Chi-squared test statistic for 9 d.f. has a p-value <0.10 rejecting the validity of the random effects model in favor of the fixed effects model at the 10% level of significance. Therefore, the empirical tests reported above lend support to premise that the equations based on panel data fixed estimates econometric models reported in Table 7 below would provide plausible estimates on the TFP FDI dynamics for the OECD countries during the study period.

Table 11: Panel regression equations – barro & country - specific effects

Method: Panel EGLS (Cross-section weights)						Sample (adjusted): 1984 2007						
Periods included: 24				Cross-sections included: 25					Total panel (unbalanced) observations: 586			
White diagonal standard errors & covariance (d.f. corrected)												
DEPVAR D(TFP)	Equa-tion	1	Equa-tion	2	Equa-tion	3	Equa-tion	4	Equation	5	Equa-tion	6
Variable	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value	Coeff.	P-value
LOG(GDPPC) or CONST.	0.0016	0.0521	0.0014	0.0742	0.0014	0.0794	0.0133	0.0111	0.0132	0.0117	0.0132	0.0119
DLOG(FDII)	0.0056	0.2028	0.0021	0.3896			0.0068	0.1241	0.0030	0.2337		
DLOG(FDIO)	-0.0026	0.3746			0.0001	0.9573	-0.0029	0.3359			0.0004	0.8234
DLOG(OPEN)	0.0039	0.6116	0.0032	0.6822	0.0031	0.6957	0.0050	0.4997	0.0047	0.5283	0.0049	0.5215
DLOG(GERD)	-0.0014	0.5602	-0.0010	0.6531	-0.0013	0.5875	-0.0007	0.7461	-0.0003	0.9083	-0.0005	0.8362
DLOG(CAPF/GDP)	-0.0016	0.8494	-0.0013	0.8710	-0.0015	0.8612	-0.0048	0.5227	-0.0039	0.6035	-0.0041	0.5841
DLOG(GOVX/GDP)	-0.0001	0.9921	-0.0001	0.9898	0.0002	0.9844	0.0033	0.6604	0.0026	0.7275	0.0031	0.6803
INFL	0.0006	0.0000	0.0006	0.0000	0.0006	0.0000	0.0010	0.0192	0.0010	0.0254	0.0010	0.0260
DLOG(1-1/EMP)	0.0262	0.9927	1.0715	0.6964	2.3793	0.2858	-0.7057	0.7907	0.4776	0.8508	2.1658	0.2738
DLOG(FDII)*DLOG (GERD)	-0.0004	0.6428	-0.0003	0.7557	-0.0003	0.7234						
AR(1)	0.4579	0.0000	0.4562	0.0000	0.4563	0.0000	0.2424	0.0000	0.2412	0.0000	0.2414	0.0000
R-squared	0.2667	0.0249	0.2641	0.0231	0.2613	0.0239	0.4714	0.0258	0.4689	0.0247	0.4662	0.0241
Adjusted R-squared	0.2540	0.5877	0.2526	0.5869	0.2498	0.5870	0.4398	0.6660	0.4381	0.6643	0.4353	0.6632
S.E. of regression	0.5079	148.3287	0.5077	148.4869	0.5087	149.0756	0.4987	137.2662	0.4982	137.2614	0.4986	137.4634

Durbin-Watson stat	2.0237		2.0193		2.0174		14.9178	1.8757	15.2551	1.8730	15.0936	1.8706

Explanatory notes.			
Equation (1) to (3)		Barro-effect proxied by DLOG(GDPPC) & INTERACTION EFFECT is PROXIED BY DLOG(FDII)DLOG(GERD)	
Equation (4) to (6)		IDYISYCRATIC COUNTRY (CROSS-SECTION) FIXED EFFECTS ARE PROXIED BY THE CONSTANT TERM.	
The adjusted R-sq shows that fixed effects models have a better 'Goodness of fit' than the Barro initial effect models/			
The p-value fails to reject the no Barro-effect null hypothesis at 5% level.			
The p-value rejects the null hypothesis of no cross-section fixed effects at 5% level.			
The tests favour the fixed cross-section effects model rather than the Barro effect model.			
HAUSAMAN-TEST- Correlated Random Effects			
Test Summary		Test cross-section random effects	
Cross-section random	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
	14.12707	9	0.1179
P-VALUE <12% IMPLIES THAT RANDOM-EFFECTS MODEL IS NOT VALID AT < 12% LEVEL OF SIGNIFICANCE.			

The interpretation of the empirical results reported in Table 9, are presented in the sequel.

The Hausman test results favor the cross-section or country fixed effects models rather than the random effects model at a p-value =0.12. The panel regression models (equations (1) to (3) in Table 9) indicate that the Barro-initial effect (coefficient of DLOG (GDPPC) have p-values >0.05 implying that the null-hypothesis that the Barro-effect is not significant at the 5% level of significance. The panel regression model (equations (4) to (6) in Table 7), indicate that p-value =0.01 implies the null that cross-sectional fixed effects are not-significant is not rejected at the 1% level of significance. Furthermore, the goodness of fit given by adjusted-R-squared is much higher for the country-specific fixed effects than the adjusted R-squared from the panel regressions (equations (4) to (6) Table 9) are much higher than the adjusted R-squared values for the Barro-effects panel regression equations (1) to (3) implying support for country-specific effects that Barro initial effects for the OECD countries during the study period.

The above finding that the country-specific' fixed effects' play a crucial role in explaining growth of TFP spillover effects than Barro 'initial effects' in the advanced (OECD) countries is consistent with similar findings in the GDP growth-FDI cross country empirics. These studies underscore that in developing countries that have not attained a threshold level of institutional development due to underdeveloped human capital, financial sector, the Barro initial conditions play a pivotal role in determining the absorptive capacity of FDI related growth spillover effects. While, in advanced countries TFP or growth spillover effects are not subject to institutional threshold constraints and the countries country-specific fixed effects play a key role in governing the technology transfer through FDI flows (Ghosh M and Wang W., 2009, Carkovic. M. and Levine. R. , 2009). Equation (1) to (3) Table 7 report the results for the' Barro effect' which are proxies by time-invariant initial conditions as captured by the log of per capita GDP (log GDPPC) as the crucial determinant of FDI flows and related TFP spillover effects for OECD countries as hypothesized by the convergence theories (Barro, 1995). The empirical findings for OECD countries differ from those reported for developing countries where the country-specific effects rather than the "Barro initial effect' plays the significant role in determining whether FDI flows play the role of TFP increase and associated positive spillover effect" (Ghosh M and Wang W., 2009)

The panel data empirics reported in Table 9 therefore clearly support the hypothesis that time-invariant initial conditions play a significant role in developed OECD countries in the transmission of technological spillover effects mainly through the conduits of FDI flows and of R& D (GERD). All the panel data regression empirics reported in Table 7, have been estimated using feasible GLS with cross-country weights. The standard errors have been estimated using White's hetero-scedasticity consistent co-variances corrected for degrees of freedom yielding estimates that are robust to general hetero-scedasticity using EVIEWS 7 computer software.

The Barro time-invariant initial conditions are significant for equation (1) and (3) with FDI inward stocks but not significant in FDI outward stocks. Therefore, initial conditions appear to play a significant role in inward stocks of FDI flows and in their interactions with GERD, but outward FDI stocks do not appear to be influenced by the initial conditions for the cross-country regressions as reported in equation (2). The 'goodness of fit' measured by adjusted R-squared is low for these equations relating the Barro time-invariant initial effects compared to equations (4) to (6) which focus on the importance of country-specific idiosyncratic fixed effects rather than the Barro initial effects. The country-specific effects proxies by the constant term are significant for all the equations. The inward stocks of FDI (FDII) in equation(4) and the outward stocks of FDI (FDIO) are by themselves not significant, but they appear significant as a conduit for activating R&D as the interaction term FDI*GERD are significant for all the equations (4) to (6). Besides, domestic policy variables such expansionary monetary policy as shown by the coefficient for inflation (INFL) appears to have positive effects of on the TFP spillovers through the FDI*GERD interaction effects. An FDI friendly policy environment appears to play an important role in determining the TFP spillovers according to estimates focusing on the country-specific fixed effects in equations (4) to (6) in Table 9.

Concluding observations and policy perspectives.

The panel date econometric analysis undertaken in this paper focussing attention directly of the nexus between TFP and FDI inward and outward stocks for 25 OECD economies over a 25 year period (1983-2007) provide overwhelming support for the mainstream macroeconomic model hypotheses enunciated both by neoclassical and endogenous growth theories that FDI inflows and outflows generate technological spill overs and increase total factor productivity and therefore acts as an engine of growth in advanced countries. Advanced countries are not constrained by thresholds constraints imposed by deficiency of human capital due to scarcity of skilled workers, or due to underdeveloped banking and financial institutions, lack of adequate infrastructure, and proper enforcement of property rights that plague developing countries and undermine their absorptive capacity and skill development, lack of law and order, endemic corruption.

National concerns relating to Dutch disease effects and global concerns as articulated in Kyoto protocol and the findings of climate scientists that highlight the need to restrict carbon dioxide emissions in order reduce the dangers of global warming. Negative externalities due to mining of non-renewable resources or Dutch disease effects, environmental degradation and outsourcing of services and their negative externalities are important issues that have not been addressed in this paper.

In this paper we study the impact of both inward and outward FDI on economic growth in the OECD countries using panel data estimation for the period 1980- 2004. The main findings of our study are that both inward and outward FDI positively contribute to economic growth in the OECD. However, the impact of FDI in economic growth is moderate. Coefficients for all other variables in the cross-country regression model have the expected signs. Recent studies (e.g. (Golub, 2003a) and(Golub, 2003b), (Ghosh, 2007 June) suggest tremendous potential for growth in the flows of FDI across OECD countries through reduction of barriers. Our regression results indicate that the implications for economic growth from these are however moderate.

Contrary to earlier findings, essentially on developing countries, that the positive impact of FDI is conditional on countries' stock of human capital or a threshold absorptive capacity, our results from OECD data find that FDI exert positive influence on both host and source country economic growth irrespective of any threshold requirements. This is not surprising as our sample only includes the developed economies which have already reached a threshold level of human capital stock or the level of R&D.

A major contribution of this study is the provision of empirical information on how to reconcile the conflicting objectives of austerity (spending cuts) through the increase TFP or more output with less inputs, with the objectives of growth that is generated by cross-border FDI flows. The conflicting objectives of austerity and growth are two sides of the same coin required to steer the sovereign debt ridden PIGS from imploding the single currency union and the euro zone. The crisis contagion from the collapse of the euro zone will not only have negative spillover effects on the OECD countries but also on the global economy.

References

[1] AGOSIN M. R. AND MAYER R. (2000) Foreign Investment in Developing Countries: Does it Crowd in Domestic Investment ? *United Nations Conference on Trade and Development*., Palais des Nations.
[2] ALFARO, L., A. CHANDA, S. KALEMLI-OZCAN AND S. SAYEK (2004) (2004) FDI and Economic Growth: The Role of Local Financial Markets. Journal of International Economics, 64, 89-112.
[3] APERGIS N. KATRAKILIDIS C. AND TABAKIS M. (2006) Dynamic Linkages Between FDI Inflows and Domestic Investment: A Panel Cointegration Approach. *Atlantic Economic Journal*, 34, 385-394.
[4] ARNDT, C., BUCH, C.M. AND M SCHNITZER, M., (2010) FDI and Domestic Investment: An Industry Level View. *The BE Journal of Economic Analysis and Policy*, 10, 1-20.
[5] BALASUBRAMANYAM, V. N., M. SALISU AND D. SAPSFORD (1996) Foreign Direct Investment and Growth in EP and IS Countries. *The Economic Journal*, 106, 92-105.
[6[BALTAGI, B. H. (2005) *Econometric Analysis of Panel Data*,, Chichester, Wiley.
[7] BARRO, R., J., AND, SALA-I-MARTIN, X. (1995) *Economic Growth*, New York, McGraw-Hill
[8] BHAGWATI, J. N. (1978) Anatomy and Exchange Control Regimes. Studies in International Economic Relations New York.
[9] BITZER J AND GORG H. (2009) Foreign Direct Investment, Competition and Industry Performance. *The World Economy*, 32, 21-233.
[10] BLINDER, A. (1993).
[11] BLOMSTRÖM M., A., KOKKO A., (1998) Multinational Corporations and Spillovers. *Journal of Economic Surveys*, 12.
[12] BORENSZTEIN, E., J. DE GREGORIO AND J-W. LEE (1998) How Does Foreign Direct Investment Affect Growth? *Journal of International Economics*, 45, 115-135.
[13] CARKOVIC, M., AND, R. LEVINE. (2009) Does Foreign Direct Investment

Accelerate Economic Growth? *Global Economy Journal*, 9, Art. 1.

[14] CARKOVIC. M. AND LEVINE. R. (2009) Does Foreign Direct Investment Accelerate Economic Growth? 9, Art. 1.

[15] CAVES, D., CHRISTENSEN, L.R., AND, DIEWERT, W.E., (1982) The Economic Theory of Index Numbers adn the Measurement of Input, Output and Productivity. *Econometrica*, 50, 1393-1414.

[16] COE, D. T., AND, HELPMAN,E. (1995) International R & D spilloovers. Eurpoean *Economic Review*, 39, 859-887.

[17] DE MELLO. (1997) Foreign Direct Investment in Developing Countries and Growth: A Selective Survey. *Journal of Development Studies*, 34, 1-34.

[18] DESAI, M. A., F. FOLEY AND J.R. HINES JR. & . (2005) Foreign direct investment and domestic capital stock. *American Economic Review Papers and Proceedings*, 95.

[19] ENGLE, R., AND, GRANGER, C.. (1987) Cointegration and Error Correction: Representation Estimation and Testing. *Econometrica*, 55, 251-76.

[20] FRY M.J. (1992) Foreign Direct Investment in a Macroeconomic Framework: Finance, Efficiency, Incentives and Distortions. *PRE Working Paper*, Washington D.C. World Bank.

[21] GHOSH M AND WANG W. (2009) Does FDI Accelerate Economic Growth? *Global Economy Journal*, 9.

[22] GHOSH, M., AND WANG, W. (2009) Does FDI Accelerate Economic Growth? The OECD Experience Based on Panel Data Estimates for the Period 1980-2004. *Global Economy Journal*, 9, 1-21.

[23] GHOSH, M., P. SYNTETOS AND W. WANG (2007 June) Impact of Foreign Ownership Restrictions on FDI Stock in OECD Countries. *Canadian Economic Association Meetings*.

[24] GOLUB, S. (2003a) Measures of Restrictions on Inward Foreign Direct Investment for OECD Countries. OECD *Economic Studies*, 36.

[25] GOLUB, S., N. GIUSEPPE, D. HAJKOVA, D. MIRZA, AND K. YOO (2003b) Policies and International Integration: Influences on Trade and Foreign Direct Investment. *Working Papers*. OECD Economics Department

[26] GROSSMAN, G. M. A. E. H. (1991) *Innovation and Growth in the Global Economy*, The MIT Press, Cambridge. Mass.

[27] HADRI, K. (2000) Testing for stationarity in heterogenous panel data. Econometric Jounal, 3, 148-161.

[28] HARRISON A. AND REVENGA A. (1995) The Effects of Trade Policy Reform: What Do We Really Know ? *Working Paper No. 5225*, National Bureau

of Economic Research., NBER.

[29] HECKMAN, J. J. (1978) Simple Statistical Models for Developed for Discrete Panel Data Developed and Applied to Test for Hypothesis of True State Dependence against the Hypothesis of Spurious Dependence. *Annales de I'INSEE*, 30/31, 227-269.

[30] HERZER, D. (2008) The Long-run Relationship Between Outward FDI and Domestic Output: Evidence from Panel Data. *Economics Letters* 100, 146-149.

[31] HSIAO, C. (2003) Analysis of Panel Data, Cambridge, Cambridge University Press,.

[32] IM, K. S., PESARAN, M.H., AND, SHIN, Y.,, (2003) Testing for unit roots in heterogenous panels. *Journal of Econometrics*, 115.

[33] KHAWAR, M. (2005) Foreign Direct Investment and Economic Growth: A Cross Country Analysis. *Global Economy Journal*,, 5, 1-11.

[34] KOKKO A. (1994) Technology , Market Characteristics and Spillovers. *Journal of Development Economics*, 43, 279-93.

[35] KRUGMAN, P. (1994) *The Age of Diminished Expectations*.

[36] LEVIN, A., LIN, C., AND, CHU, C.S.J., (2002) Unit root tests in panel data. *Journal of Econometrics*, 108, 1-24.

[37] MADDALA, G. S. A., WU, S.. (1999) A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and Statistics*, 61, 631-652.

[38] MARKUSEN J R AND VENABLES A J. (1998) Multinational Firms and the New Trade Theory. *Journal of International Economics*, 46, 183-203.

[39] MUNDLAK, Y. (1961) Empirical Production Function Free Management Bias. *Jounral of Farm Economics*., 43, 44-56.

[40] O'DONELL, C. J. (2008) An Aggregate Quantity-Price Framework for Measuring and Decomposing Productivity and Profitability Change. *Working Paper.*

[41] O'DONELL CJ. (2009) Mesauring and Decomposing Agricultural Productivity and Profitability Change. *Conference of Agricultural Resource Economics Society*.

[42] PEDRONI, P. (1999) Critical values for cointegration tests in heterogenous panels with multiple regressors. *Oxofrd Bulletin of Economics and Statistics*, 61, 653-670.

[43] PEDRONI, P. (2001) Purchasing power parity tests in cointegrated panels. *The Review of Economics and Statistics*, 83.

[44] PEDRONI, P. (2004) Panel cointegration: asymptotic and finite sample

properties of pooled time series tests with an application to PPP hypothesis. Econometric Theory., 20.

[45] PORTER, M. E. (1991) The Competitive Advantage of Nations.

[46] ROMER, P. (1990) Endogenous Technical Change. *Journal of Political Economy*, 98: . S71-S102.

[47] SAVVIDES, A., AND, ZACHARIADIS, M. (2005) Internatioonal technology diffusion and growth of TFP in the manufuacturing sector of developing countries. *Review of Development Economics*, 9, 482-501.

[48] SHANKS. S. AND ZENG. S. (2006) Econometric Modelling of R&D and Australia's Productivity. *Staff Working Paper, Productivity Commission*.

[49] SOLOW, R. M. (1956) A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics*, 70, 65-94.

[50] STEVENS, G. V. G., LIPSEY, R.E (1992) Interactions between domestic and foreign investment. *Journal of Money and Finance,* 11, 40–62.

[51] STIGLITZ, J. (2009) *Making Globalization Work*, New York, Norton & Co.

[52] VAN POTTELSBERGHE, B., AND LICHTENBERG, F. (2001) Does Foreing direct investment transfer technology across borders,. *The Review of Economics and Statistics*, 83, 975-1000.

[53] XU, B. (2000a) Multinational Enterprises, Technology Diffusion, and Host Country Productivity Growth. *Journal of Development Economics*, 62, 477-493.

[54] XU, B. (2000b) Multinational Enterprises, Technology Diffusion, and Host Country Productivity Growth. *Journal of Development Economics* 62, 477-493.

APPENDIX – PANEL DATABASE OECD (Not for publication due to space constraints)

Appendix - Panel DATABASE												
CON_ IDENT	DTFP	GDP	GDPPC	FDII	FDIO	OPEN	INFL	GOVX	EMP	CAPF	DEFL	YEAR
Australia	1	90907.96922	15889.84	26262.53	5731.628	0.6621	-3.30863	13561.99	6416.5	16255.45	78.32988	1982
Austria	4.1218	307893.9265	17798.34	3030.623	675.9154	0.6621	-0.93654	13561.99	3090.3	16255.45	52.46954	
Belgium	0.7163	58936.86625	16969.93	3000	3000	1.3299	-3.06917	21562.9	3533.693	18032.56	54.55581	
Canada	0.8677	52258.6959	17748.22	59227.27	30473.4	0.4749	3.846541	70468.23	8500	59396.95	69.34697	
Denmark	0.6864	574493.0243	22223.13	2628.101	1386.45	0.7381	-1.10805	16712.15	2368.7	10500.64	51.76992	
Finland	0.7985	751505.2324	22397.16	1044.415	670.9318	0.5818	-3.05478	9968.721	2385	14436.27	48.34598	
France	0.695	52546.46412	18196.08	35676.77	32587.28	0.4623	-3.14254	130511.9	21644.2	126639.6	56.50958	
Germany	0.7282	3159.113848	22158.59	32130.86	45964.23	0.4806	-1.26319	159998	26774	162283	55.1049	
Greece	0.6437	20837.82464	8741.528	6127.7	2000	0.4923	-5.22033	7941.19	55810	12843.68	61.36629	
Iceland	0.6592	411662.9903	22219.44	57.42416	53	0.6907	-7.22443	596.0345	115.6	885.8738	60.9863	
Ireland	0.7433	1083891.171	10198.04	35889.32	9000	0.9704	-1.80294	4343.564	55360	5452.194	58.8182	
Italy	0.736	79454.3	15984.88	7376.642	8424.09	0.4532	1.133705	75511.82	20725	97572.25	45.49755	
Japan	0.7037	203057.2905	18287.17	3998	28969	0.2835	3.672464	154850.3	55810	329486.1	49.97119	
Korea, Republic of	0.7217	1161.801257	3366.048	1363.159	246.509	0.6528	0.055733	9714.504	14023	22460.29	58.5526	
Mexico	0.6769	106412.8692	3308.359	2983.77	1758.791	0.2800	-8.16012	19722.29	15200	57413.14	78.06307	
Nether-lands	0.7086	61850.31583	16117.19	17975.6	39737.3	1.9055	-3.02589	301.282	5107.9	218.9801	63.75029	
New Zealand	0.6511	29192.88959	12300.51	2308.03	55.7283	0.4686	-2.11984	10484.14	1350.5	10532.1	61.48595	

Scientific Papers (www.scientificpapers.org)
Journal of Knowledge Management, Economics and Information Technology

Norway	0.6782	190311.3495	22687.37	7708.395	618.798	0.7784	-3.57296	16939.33	1935	16674.69	66.30564	
Portugal	0.6698	106412.8692	5714.509	3412.171	535.4961	0.5915	-5.45845	3895.18	3968.5	9941.407	51.45439	
Spain	0.6998	105123.3112	10382.25	5325.356	2953.8	0.3648	-6.90078	28751.79	11230.6	41792	48.24699	
Sweden	0.6638	86764.24211	23912.45	3427.24	5757.76	0.6637	-5.20837	31278.19	4225	20244.81	53.4682	
Switzer-land	0.7328	492477.2254	30279.28	7000	17000	0.6703	-0.39472	10968.9	3240	26992.46	54.3832	
Turkey	0.6653	3246777.003	2042.036	8990	7000	0.2122	-5.87572	6635.769	4500	15640.44	65.55052	
United Kingdom	0.6646	184118.2328	13623.28	52149.7	84016.53	0.5024	-5.27478	106949.4	24345	80716.67	62.961	
United States	0.7398	71494.2444	17831.47	124677	207752	0.1877	3.034947	571067	100397	605446	76.80205	
Australia	1	86061.69676	16399.54	26458.31	6316.948	0.6453	1.596193	13722.66	6300.4	15546.18	75.02126	1983
Austria	0.7312	333804.3143	18338.21	2750.22	746.2585	0.6453	-2.98903	13722.66	3158.4	15546.18	51.533	
Belgium	1.4362	59204.86533	17033.29	4000	5000	1.3578	-3.44944	20118.48	3432	14826.74	51.48663	
Canada	1.3413	50400.24914	18049.56	64022.02	39940.97	0.4766	-1.2565	75799.85	9500	66002.84	73.19351	
Denmark	1.365	549026.7807	22828.97	2811.646	1494.938	0.7240	-3.25015	16358.24	2389.3	10564.91	50.66187	
Finland	1.1563	745824.3141	22929.09	1013.425	1306.294	0.5808	0.28369	9840.73	2419	13640.82	45.29121	
France	1.3966	47557.59772	18308.69	37307.78	36554.74	0.4601	-3.43939	125763.8	21693.7	109706.7	53.36704	
Germany	1.2745	2724.978297	22594.75	29777.15	46253.18	0.4718	-4.57636	156873.4	26608	166539.7	53.84171	
Greece	1.4317	20149.74209	8601.066	6865.1	2400	0.4843	-2.66493	7431.327	57330	11177.93	56.14596	
Iceland	1.5042	426854.3993	21489.81	34.02416	57	0.7721	-0.29355	516.3394	122.8	572.8146	53.76188	
Ireland	1.5097	1182299.817	10086.27	36058.97	11000	1.0094	-4.11246	4106.544	56380	4522.583	57.01526	
Italy	1.4484	88099.21841	16138.59	7320.277	13099	0.4186	-1.98145	80032.41	20725	94838.26	46.63126	
Japan	1.4763	174019.5922	18449.66	4364	37921	0.2613	1.711338	172534.3	57330	335550.3	53.64365	

Korea, Republic of	1.7764	1155.98983	3669.164	1452.81	397.284	0.6345	1.189189	10277.04	14505	25179.6	58.60833	
Mexico	1.8065	97850.79162	3108.623	5175.369	1783.166	0.3098	9.687494	14209.61	15500	44573.85	69.90296	
Nether-lands	1.326	60780.25137	16368.77	16924.2	39781	1.7274	-6.10892	323.7119	5007	200.0611	60.7244	
New Zealand	1.3238	26050.83895	12523.29	2249.992	489.8763	0.5204	-5.15849	12700.73	1390.6	12343.38	59.36611	
Norway	1.3862	165977.9706	23490.26	8051.579	667.107	0.7579	-3.18115	15135.2	1945	16695.3	62.73268	
Portugal	1.5758	97850.79162	5676.351	3567.254	567.03	0.6254	-2.59994	3524.858	4352.8	7352.404	45.99594	
Spain	1.4145	104914.0655	10518.95	5277.92	3536.33	0.3974	-0.44952	25823.88	11044.4	35069.08	41.34621	
Sweden	1.3368	82911.91265	24353.41	3374.58	7341.9	0.7044	-0.14215	28066.32	4224	18349.68	48.25983	
Switzer-land	1.3181	466934.9336	30280.81	8277.128	17849.52	0.6748	-4.11501	11312.54	3256.5	26304.54	53.98848	
Turkey	1.7219	3527963.004	2098.292	9036	9000	0.2318	-5.2848	6998.445	15990	14024.96	59.67481	
United Kingdom	1.4125	197983.5063	14091.88	54008.73	86874.91	0.5153	-4.79443	100716.6	23624	80268.34	57.68622	
United States	1.4297	67402.63254	18466.6	137061	218093	0.1791	2.997422	616688	100834	658836	79.83699	
Australia	1.0001	82275.81045	17023.92	26385.32	6653.094	0.6876	-12.1994	12966.5	6493.86	15191.42	76.61745	1984
Austria	0.9701	347149.6964	18321.41	2674.104	1079.051	0.6876	-0.23019	13235.41	3235.3	15191.42	48.54398	
Belgium	0.9651	57714.6439	17457.07	5000	6000	1.4461	0.873733	19175.65	3466.336	14974.88	48.03719	
Canada	1.0035	52259.10841	18895.7	65070.38	43142.75	0.5375	-1.58912	75737.41	10000	71196.33	71.93701	
Denmark	0.9328	521269.2899	23796.44	2761.368	1800.938	0.7396	0.921175	14855.85	2488.4	11604.59	47.41172	
Finland	1.0311	701694.1657	23500.86	1039.816	1829.131	0.5729	1.001563	10198.76	2442	13573.28	45.5749	
France	1.0293	46211.23615	18473.01	39506.29	38780.64	0.4830	1.316089	120169.3	21509	100620	49.92765	

Germany	1.0137	2822.001925	23330.78	26934.88	59908.58	0.5007	-0.62848	146168	26626	155132.9	49.26535	
Greece	0.9849	19510.47847	8734.554	7588	2600	0.4811	-1.53223	7443.491	57660	11302.17	53.48104	
Iceland	0.9611	421901.3687	22116.47	47.72416	59.4609	0.7605	0.457126	491.3052	128.5	653.902	53.46832	
Ireland	1.0206	1258070.288	10459.37	36180.33	12206.05	1.1187	1.386614	3844.216	57330	4183.041	52.90279	
Italy	0.9852	97169.59849	16631.89	11565.28	16599.9	0.4420	0.203825	78225.07	20809	98218.47	44.64981	
Japan	1.0461	205268.1186	18902.75	4458	43974	0.2736	1.038158	180953.4	57660	355031.6	55.35499	
Korea, Republic of	1.0129	1167.612684	3905.19	1585.401	461.039	0.6342	-1.76156	10663.71	14429	28999.03	59.79752	
Mexico	1.0525	101769.2005	3162.693	6716.368	2005.145	0.2937	1.773355	17584.87	16000	50315.56	79.59045	
Nether-lands	1.0034	61098.8845	16858.5	18016.5	47813	1.6120	-1.00068	345.5782	5120.5	182.4128	54.61548	
New Zealand	0.9651	24116.23742	13027.34	1739.612	662.3608	0.6516	-0.17679	14441.11	1400.5	15313.67	54.20762	
Norway	1.01	167103.4295	24793.28	7831.03	1092.78	0.7697	-0.10469	15913.58	1970	15923.87	59.55153	
Portugal	1.1594	101769.2005	5551.625	3787.228	589.6069	0.6839	1.989799	3239.578	4288.2	5352.752	43.396	
Spain	1.0716	99955.38233	10667.29	6331.411	4455.4	0.4159	1.09072	25591.42	10743.2	33466.86	40.8967	
Sweden	1.0151	80641.27502	25379.8	3337.23	10767.5	0.7031	1.173347	28188.19	4255	19758.35	48.11769	
Switzer-land	0.9916	439021.5497	31043.61	7652.998	25093.19	0.7146	-1.09587	10546.85	3288.2	26760.3	49.87347	
Turkey	1.0941	3922889.002	2193.413	9149	1163.97	0.2821	4.087404	5812.429	16000	13682.85	54.39001	
United Kingdom	1.0166	173604.2099	14436.88	46375.54	100313.5	0.5632	1.049511	93646.15	24235	79654.79	52.89179	
United States	1.0015	68782.54505	19600.28	164583	238369	0.1874	2.529866	671865	105005	835801	82.83441	
Australia	0.9999	85156.19868	17513.6	26615.78	8653.712	0.7240	1.536704	13370.63	6697.45	15848.8	64.4181	1985

Austria	1.1433	355708.4794	18768.18	3580.15	1219.11	0.7240	19.12346	13561.99	3234.5	15848.8	48.31378	
Belgium	1.1057	61203.8532	17736.71	6000	7000	1.3970	17.91983	19409.59	3513.8	14841.41	48.91092	
Canada	1.0358	55159.61198	19566.23	64656.89	46935.17	0.5424	0.878155	77675.79	11742	74381.72	70.3479	
Denmark	1.0231	544152.0038	24762.96	3613.335	2454.938	0.7514	16.65398	15508.68	2553.4	13193.55	48.33289	
Finland	1.0663	708870.1758	24158.12	1338.564	2341.865	0.5610	13.12194	11268.11	2466	14066.43	46.57646	
France	1.1097	46013.64396	18680.85	41716.12	44011.37	0.4774	18.74437	125540.7	21450.3	104591.4	51.24374	
Germany	1.1036	2939.842439	23885.25	36925.61	78084.3	0.5188	19.27994	147157.9	26940	152840.1	48.63687	
Greece	1.0564	20639.57956	8916.104	8308.7	2856.477	0.4750	8.987449	7704.228	58070	11834.9	51.94881	
Iceland	1.1609	435686.2914	22583.82	71.32416	61.5609	0.8032	13.91775	539.4305	130	610.598	53.92545	
Ireland	1.2045	1346803.939	10742.97	36343.99	12206.05	1.1131	19.31738	4037.018	57660	3880.224	54.28941	
Italy	1.0929	100722.3555	17076.36	18976.47	26080	0.4441	16.8972	81441.53	20894	100814.7	44.85364	
Japan	1.0896	215658.8732	19752.5	4743	58071	0.2531	24.7624	188377.1	58070	386872.3	56.39315	
Korea, Republic of	1.1995	1189.889823	4110.195	1803.286	619.326	0.5995	2.402996	11143.37	14970	29751.22	58.03596	
Mexico	0.8786	106562.0396	3191.035	8699.968	2326.668	0.2811	-22.0508	18464.21	18000	56362.56	81.36381	
Nether-lands	1.1677	64256.95088	17154.45	24698.7	57540.8	1.5791	18.84767	353.0736	5144.5	218.9801	53.6148	
New Zealand	1.1922	25930.11096	13030.49	2042.901	749.1283	0.5648	13.47913	18595.28	11475.5	19553.94	54.03083	
Norway	1.1001	175542.7549	26030.08	7436.368	1608.65	0.7813	9.204538	16657.22	2014	15693.65	59.44684	
Portugal	1.4348	106562.0396	5696.931	4080.757	608.1529	0.6533	16.88634	3597.754	4279.2	5342.243	45.3858	
Spain	1.1222	101211.232	10880.62	8939.026	5937.54	0.4091	14.53896	27367.95	10641.1	35538.32	41.98741	
Sweden	1.0282	90378.97493	25889.82	4333.27	16131.4	0.6994	14.13273	29162.73	4299	22485.45	49.29103	
Switzer-land	1.1523	463442.1191	31937.47	10093.38	34226.05	0.7407	19.84752	10759.15	3354	27051.98	48.7776	

Turkey	1.1532	4209469	2241.703	9248	1163.98	0.2783	3.069514	6525.83	16162	18338.02	58.47741	
United Kingdom	1.1823	181997.7952	14925.41	64027.56	118945.7	0.5611	9.773768	95342.59	24539	83697.57	53.9413	
United States	1.0725	98203.17766	20201.91	184615	270472	0.1776	1.909155	736335	107150	851659	85.36428	
Australia	0.9998	118476.1017	17654.57	27310.68	14881.37	0.6611	9.029793	19296.7	6974.51	22027.73	65.9548	1986
Austria	1.0072	368867.2185	19153.66	4989.278	1334.667	0.6611	15.83873	13722.66	3282.3	22027.73	67.43724	
Belgium	1.1469	86365.55676	18036.37	7000	8000	1.2668	14.48198	26946.47	3524.8	20200.69	66.83075	
Canada	0.9605	72556.50253	19779.22	69579.14	57037.24	0.5474	6.84872	80180.64	12095	77821.52	71.22605	
Denmark	1.0559	761419.8768	25986.35	4591.488	3073.938	0.6737	15.5686	20875.56	2662.5	20177.01	64.98688	
Finland	1.2023	1012517.95	24696.78	1680.434	4432.565	0.5035	12.1075	15031.1	2458	17745.05	59.6984	
France	1.138	54253.72485	19029.84	44464.55	52712.41	0.4138	12.90076	173000.9	21550.7	151250.5	69.9881	
Germany	1.1672	3930.526899	24383.63	49277.1	99144.48	0.4650	15.18554	208995.8	27083	218499.8	67.91681	
Greece	1.1043	27863.8231	8927.928	9071	2866.813	0.5018	11.6548	8611.935	58530	13504.42	60.93626	
Iceland	1.2079	616972.1657	23732.05	79.82416	62.2609	0.7331	18.63862	738.3851	132	724.4523	67.8432	
Ireland	1.1986	1995533.661	10689.36	36594.28	12314.26	1.0033	9.466289	5512.07	58070	4917.747	73.60679	
Italy	0.7883	116031.1571	17550.93	25553.52	32331.8	0.3767	13.54667	113402.5	21006	133996.3	61.75084	
Japan	0.7253	151310.2374	20241.8	6514	77022	0.1869	13.67017	279448.4	58530	568368.7	81.15555	
Korea, Republic of	1.5381	1543.781557	4484.726	2238.947	939.423	0.6266	7.986626	12566.57	15505	33303.79	60.43895	
Mexico	0.7346	140938.2969	3013.891	11100.67	2293.923	0.3363	3.786754	12776.35	20000	34621.99	59.31297	
Nether-lands	2.1449	77202.4265	17624.33	33354.2	72092	1.2979	14.16166	388.9164	5600	401.887	72.46247	
New Zealand	1.9356	37050.97957	13226.84	2364.701	1309.156	0.5695	17.78489	20949.67	1544.1	20417.82	67.50997	

Norway	2.219	244016.3763	26980.87	8470.076	2455.03	0.7192	12.11962	24197.46	2086	21013.45	68.65138	
Portugal	0.5738	140938.2969	5930.286	4353.802	596.5423	0.5737	10.5234	5086.924	4287.1	8264.259	62.27214	
Spain	0.1634	144843.3563	11204.73	13435.96	8421.1	0.3539	11.39643	37554.33	10880.9	51557.61	56.52638	
Sweden	0.2313	101796.1748	26525.76	6012.612	23939.81	0.6346	11.28198	37955.48	4299	27913.9	63.42376	
Switzer-land	1.9984	568691.3275	32276.42	18604.87	45276.06	0.7005	15.99329	15430.06	3430	38490.2	68.62512	
Turkey	3	4451578	2354.153	9373	1172.98	0.2356	3.161443	7387.769	16500	23975.23	61.54692	
United Kingdom	1.024	217488.6919	15489.24	76282.81	152609.5	0.5164	11.07798	116958.7	24568	101444.3	63.71507	
United States	0.8717	123087.8835	20672.8	220414	326253	0.1809	2.410536	792738	109597	874675	87.27344	
Australia	0.9666	147474.6693	18264.04	42955.61	28501.77	0.6493	16.6038	24153.26	7128.76	27924.51	74.9846	1987
Austria	0.3242	421532.8151	19411.61	6648.267	1359.729	0.6493	3.320117	12966.5	3299.8	27924.51	83.27597	
Belgium	0.7787	107366.082	18414.82	8000	9000	1.2396	3.041952	33065.16	3479.827	26593	81.31273	
Canada	0.3755	90377.00596	20331.95	81502.54	66876	0.5246	9.820914	88890.45	12422	93109.94	78.07477	
Denmark	1.0784	924178.3794	26048.27	5628.639	3793.938	0.6385	4.521208	27201.96	2678.7	22967.94	80.55547	
Finland	1.0223	1256278.938	25493.17	2620.122	5708.419	0.4988	9.551566	19064.47	2452	22753.19	71.80589	
France	0.979	63170.69896	19391.99	49084.08	52533.94	0.4064	3.318621	208181.9	21631.2	187575.1	82.88887	
Germany	0.7302	5438.529434	24685.96	64713.88	104186.4	0.4514	3.385697	262062.2	27366	264165.6	83.10235	
Greece	1.7092	32913.71864	8696.261	10135.5	2884.011	0.4980	8.268405	10215.17	59110	11964.34	72.59106	
Iceland	3.0858	776335.1067	25477.05	82.22416	56.29222	0.6959	9.271221	1067.361	134	1125.974	86.48182	
Ireland	1.0491	2420153.833	11207.32	36916.76	13064.39	1.0408	4.845956	6143.573	58530	5289.68	83.07308	
Italy	1.0472	145950.933	18103.74	31353.43	36906.96	0.3704	4.664713	148473.7	20986	171556.8	75.29751	
Japan	1.0374	163957.9054	20928.1	9018	110780	0.1765	13.0155	341146.7	59110	701733.6	94.82572	

Korea, Republic of	0.9974	1613.760832	4918.947	2840.804	1095.617	0.6573	14.37507	15423.52	16354	43592.32	68.42558	
Mexico	0.9971	171653.8414	3011.644	13735.27	2332.195	0.3591	13.22203	13372.01	22000	38977.7	63.09973	
Nether-lands	0.9663	92448.47828	17875.1	43449.4	73471.3	1.4293	2.880035	393.5376	5864	345.5536	86.62413	
New Zealand	1.0678	46076.16545	13219.1	3159.424	1923.673	0.5642	16.56717	24474.43	1556.8	18791.43	85.29486	
Norway	0.978	309478.061	27352.74	8616.125	3972.603	0.6700	6.799181	27581.8	2126	25367.91	80.771	
Portugal	0.7829	171653.8414	6314.523	4869.681	642.0109	0.6326	6.401268	6246.021	4402.7	12142.97	72.79553	
Spain	1.0564	180918.9742	11800.2	22992.05	9434.11	0.3631	8.350686	49206.05	11368.9	69698.31	67.92281	
Sweden	0.9021	117175.6311	27311.25	9233.926	28422.93	0.6396	7.512175	44836.56	4316	35678.79	74.70574	
Switzer-land	0.9456	697700.0564	32474.02	26307.36	48907.05	0.6902	3.923214	19078.27	3515	48809.32	84.61841	
Turkey	1.0329	4728278	2531.211	9488	1172.99	0.2650	1.334984	7399.859	17000	27505.58	64.70837	
United Kingdom	1.0581	274882.9669	16162.12	109351.7	184958	0.5152	11.79096	139823.4	25083	130888.3	74.79305	
United States	0.9722	132148.3596	21128.35	263394	347179	0.1920	3.073646	838716	112440	916080	89.68397	
Australia	0.9044	160218.2118	18633.06	62070.65	28950.23	0.6877	6.233687	25642.57	7181.7	31810.02	91.58839	1988
Austria	0.7459	498163.5237	20032.11	6816.395	2878.329	0.6877	-3.19397	13370.63	3310.6	31810.02	86.59609	
Belgium	0.8372	113230.3601	19234.47	9000	10000	0.6877	-1.86615	33628.13	3495.9	32166.74	84.35468	
Canada	1.0616	107621.5746	21035.25	95728.18	77604.94	0.6877	7.617611	103933.6	12818.9	113871.8	87.89569	
Denmark	1.0561	1005374.748	25985.15	5485.307	5859.938	0.6877	-2.85405	29246.72	2694.9	22916.5	85.07668	
Finland	0.9972	1355931.51	26714.63	3039.818	7938.187	0.6877	2.88092	21842.15	2458	29593.37	81.35746	
France	0.928	73383.25397	20170.71	56286.8	76889.09	0.6877	-3.05564	222683.4	21829.5	216179.1	86.20749	

Germany	0.8638	6016.183109	25403.25	61525.59	121075.5	0.6877	-3.36991	279445.2	27742	294374.8	86.48804	
Greece	1.0262	36651.07216	9035.302	11632	2870.892	0.6877	0.00609	10438.48	60110	16012.96	80.85947	
Iceland	1.0134	859008.2745	25179.98	94.55981	60.11117	0.6877	-7.03554	1246.848	135	1253.502	95.75304	
Ireland	1.0533	2938525.965	11826.71	37174.2	14577.68	0.6877	-1.59843	6235.5	59110	5741.884	87.91903	
Italy	0.9303	195406.4203	18859.25	36883.98	42779.22	0.6877	0.594493	167759.9	21253	193691.3	79.96222	
Japan	0.9677	200783.465	22267.96	10416	154367	0.6877	-5.35774	402830.5	60110	916320.5	107.8412	
Korea, Republic of	1.0629	1673.085823	5377.711	3689.151	1488.02	0.6877	12.57394	20732.6	16870	60437.09	82.80065	
Mexico	1.0061	193829.6344	2990.745	16615.26	2449.134	0.6877	12.85679	16095.56	28127.9	50587.04	76.32176	
Nether-lands	0.8904	100057.3374	18370.13	42545.5	88004.6	0.6877	-4.95927	390.3816	6032	467.1857	89.50417	
New Zealand	0.9464	53881.99889	13135.72	3167.902	2058.829	0.6877	-4.05456	27488.73	1508.2	17906	101.862	
Norway	0.9369	365230.5831	27190.29	8660.578	5094.482	0.6877	-0.24687	28542.96	2114 4	27839.26	87.57018	
Portugal	0.9676	193829.6344	6798.833	5861.227	737	0.6877	0.820194	7584.494	4516.8	15803.96	79.1968	
Spain	1.0626	195539.8287	12377.31	29578.08	11371.7	0.6877	3.957644	57500.48	11772.7	90025.6	76.2735	
Sweden	1.0124	122128.8501	27877.93	9907.422	38220.65	0.6877	2.175323	49475.91	4375	42239.81	82.21791	
Switzer-land	0.8688	847689.0362	33300.68	25229.85	54628.52	0.6877	-7.06959	20934.7	3607	55531.76	88.54162	
Turkey	1.0509	5092167	2539.819	9842	1173	0.6877	11.64636	7505.426	19445	28083.08	66.04335	
United Kingdom	0.8979	304353.1666	16926.51	129654.3	194182	0.6877	-0.97821	164012.6	25914	178981.4	86.58401	
United States	0.9439	131913.3385	21746.07	314754	381781	0.6877	3.522418	877279	114968	952384	92.75762	
Australia	0.9778	162108.986	19067.11	70169.88	30506.67	0.7289	2.177921	25123.81	7716.3	32837.72	97.82208	1989

Austria	1.5961	555517.4234	20663.69	9208.225	4746.903	0.7289	16.59788	19296.7	3346.4	32837.72	83.40212	
Belgium	0.7485	110058.7879	19844.09	10000	11000	1.4090	17.51147	32739.06	3594.9	35024.99	82.48853	
Canada	1.1312	117467.6383	21280.7	105945.8	84807.38	0.5134	4.486704	116944.2	13086	129348.9	95.5133	
Denmark	0.9039	1010119.614	26094.68	6905.335	7341.938	0.6972	17.77737	28016.57	2645.3	22678.39	82.22263	
Finland	0.7954	1353872.505	28071.66	3964.77	11227.3	0.4860	15.76162	23493.53	2531	35812.53	84.23838	
France	0.8011	76177.54263	20898.33	69348.07	112441.2	0.4478	16.84815	218498.7	22146.2	226311.5	83.15185	
Germany	0.8463	5588.534138	25987.18	84218.4	151581	0.4896	16.88187	265887.1	29334	306227.3	83.11813	
Greece	0.9296	38076.79926	9332.821	13011	2881.598	0.4796	19.13444	11506.84	61280	16789.29	80.86556	
Iceland	0.769	894717.4451	24979.37	108.3374	74.97743	0.6480	11.28249	1121.024	136	1050.917	88.71751	
Ireland	0.821	2940287.139	12544.13	37366.96	14941.57	1.1619	13.67939	6016.005	60110	6730.864	86.32061	
Italy	0.7677	240260.9247	19493.94	49390.79	60184.31	0.3859	19.44328	172992.3	21154	199506.9	80.55672	
Japan	0.6933	244456.0701	23369.34	9160	201441	0.1930	-2.48349	396644.3	61280	950672.7	102.4835	
Korea, Republic of	0.6846	1878.236153	5677.969	4426.412	2300.909	0.5633	4.625411	27295.47	17560	80356.04	95.37459	
Mexico	0.8528	204421.7045	3056.434	19790.76	2672.373	0.3467	10.82146	19258.02	2900	62633.18	89.17854	
Nether-lands	1.0758	100770.512	19054.58	52051.5	106899.5	1.6110	15.4551	432.5604	6155	619.0655	84.5449	
New Zealand	1.0073	57946.30764	13115.66	5180.12	4421.912	0.6179	2.192532	32897.49	1468.4	24026.32	97.80747	
Norway	1.1508	402726.0533	27337.97	9690.098	10884.47	0.7248	12.67669	25896.3	2049	25354.04	87.32331	
Portugal	0.8666	204421.7045	7248.856	7669.5	900	0.6887	19.983	8580.898	4613.1	15781.59	80.017	
Spain	0.6857	188114.1006	12950.19	41951.48	15651.54	0.3730	19.76886	65471.03	12258.3	104465.3	80.23114	
Sweden	0.7982	144027.0894	28477.83	10920.19	50719.55	0.6404	15.60677	52567.73	4442	48938.37	84.39323	
Switzer-land	1.0442	855936.4419	34540.02	25669.38	66087.15	0.7484	18.52798	20468.39	3704	56371.03	81.47202	

Turkey	0.8915	5472304	2502.256	10505	1157	0.2706	22.31028	10863.49	18866	30918.59	77.68972	
United Kingdom	0.9891	310528.0276	17250.14	150200.9	229306.8	0.5096	14.39419	163441.5	26684	186526.6	85.60581	
United States	1.3641	164851.2946	22250.09	368924	430521	0.2083	3.719965	919431	117342	1021589	96.28003	
Australia	1.1876	202688.6456	18673.29	73643.63	30888.81	0.7393	1.738071	31029.02	7836.6	41300.99	100	1990
Austria	0.6972	582735.3174	21509.44	10971.68	5993.88	0.7393	1.076436	24153.26	3420	41300.99	100	
Belgium	1.1667	135839.0686	20405.49	11000	12000	1.3699	0.676388	40529.4	3636.7	45319.91	100	
Canada	1.0891	139560.8036	21036.73	112843.2	94382.14	0.5150	4.847279	129774.8	13165.1	121857.3	100	
Denmark	1.2371	1246905.628	26428.11	9191.828	15608.35	0.6971	-0.66179	34127.33	2670	27082.4	100	
Finland	1.295	1714442.036	27988.06	5132.361	10845.15	0.4643	-3.7047	30219.23	2525	39874.52	100	
France	1.3045	94202.54678	21342.58	97814.2	132571.7	0.4384	-1.03752	270947.3	22381.1	280801.5	100	
Germany	1.3736	6372.905667	21583.55	111230.9	173265.2	0.4966	0.363855	330118.9	29684	397047	100	
Greece	1.1229	47845.63165	9271.453	5680.8	2855.857	0.4718	4.177306	14301.86	62490	21301.63	100	
Iceland	1.1982	1133465.444	25012.11	146.7413	100.9349	0.6598	7.056601	1269.264	137	1209.381	100	
Ireland	1.1272	3018270.974	13613.22	37988.87	15134.71	1.0850	-0.93645	7779.396	61280	9889.746	100	
Italy	1.4683	274976.0803	19886.16	59997.56	70400.18	0.3825	3.855534	228221.3	21454	253267.8	100	
Japan	1.4501	288013.2464	24500.73	9850	231791	0.2003	10.64481	404536.8	62490	999968.9	100	
Korea, Republic of	1.4118	1980.288633	6136.763	5185.608	3327.627	0.5393	6.803395	32050.13	18085	101681.9	100	
Mexico	1.2838	244717.0529	3149.848	22424	2849.283	0.3490	14.84599	23006.2		74432.3	100	
Nether-lands	0.9569	117623.7039	19720.04	68731	117255	1.7553	0.429603	473.0926	6356	590.4745	100	
New Zealand	0.9233	75278.36893	12970.98	7938.44	5890.608	0.6149	-2.24628	38631.94	1481.4	29450.85	100	

Norway	1.0029	520938.2507	27731.73	12391.03	12154.7	0.7393	-1.33491	26682.89	2030	24603.09	100	
Portugal	1.3441	244717.0529	7543.433	10571	1363	0.6907	8.617743	11751.17	4717.5	20087.22	100	
Spain	1.5813	239641.3311	13412.66	65916.39	20528.08	0.3552	4.899928	86901.39	12578.8	135941.5	100	
Sweden	1.3283	202545.7796	28592.35	12636.01	54797	0.6047	6.671958	65759.54	4485	56760.37	100	
Switzer-land	0.9682	1006802.904	35535.97	34244.77	75884.4	0.7105	2.137398	26795.62	3821	72325.81	100	
Turkey	1.1202	5789487	2686.512	11189	1184	0.2435	-0.67784	17922.44	19946	45093.9	100	
United Kingdom	1.0995	316709.7585	17335.83	203905.4	232140.9	0.5020	5.879272	195891.8	27191	199534	100	
United States	0.7996	172161.7208	22396.79	394911	467844	0.2126	3.490602	983441	118793	1021536	100	
Australia	1.0162	207800.7057	18438.82	77057.15	34539.53	0.7241	-4.57076	32709.47	7667.9	43671.94	101.7381	1991
Austria	0.7621	598199.3803	22141.46	11510.64	6584.084	0.7241	10.1941	25642.57	3481.7	43671.94	101.0764	
Belgium	0.9368	136694.8637	20715.4	12000	13000	1.3374	9.921132	43328.34	3730.5	43588.58	100.6764	
Canada	1.112	125998.9601	20339.38	117024.9	87869.56	0.5081	-4.15526	141600.5	12916.1	112365.5	104.8473	
Denmark	1.0639	1246494.315	26703.25	14712.1	16305.7	0.7165	7.696101	34607.43	2647.2	25517.87	99.33821	
Finland	1.0397	1808581.718	26121.42	4220.421	8564.538	0.4433	-8.78796	31157.9	2402	27827.75	96.2953	
France	0.9614	101180.0807	21457.18	110174.2	156329	0.4422	8.763984	277022.9	22420.3	270525	98.96248	
Germany	0.945	6807.371248	22550.01	123992.1	178353.8	0.5194	11.58488	344839.7	30094	433972.4	100.3639	
Greece	0.9865	48312.10565	9477.019	6815.8	2902.356	0.4537	10.17345	14488.71	63690	23583.76	104.1773	
Iceland	0.99	1195221.06	24707.25	165.3901	98.37297	0.6383	6.484199	1399.707	136.9	1363.59	107.0566	
Ireland	0.9583	3451455.013	13849.39	39350.54	15349.1	1.0996	8.604573	8309.575	62490	9125.955	99.06355	
Italy	0.9875	321269.921	20176.27	61575.56	70369.25	0.3571	5.291796	241756.5	21595	263190	103.8555	
Japan	0.9804	344737.5917	25228.51	12297	248058	0.1845	8.955539	465262.1	63690	1130234	110.6448	

Korea, Republic of	0.9494	2076.591133	6654.659	6318.117	4425.365	0.5236	1.176341	36892.14	18677	125825.1	106.8034	
Mexico	1.0135	258226.5764	3220.294	30790	3496.283	0.3247	13.30397	29816.32	30534.1	89811.63	114.846	
Nether-lands	0.9935	119656.622	20068.04	72474.8	121061.3	1.7294	9.016019	478.7597	6521	651.1689	100.4296	
New Zealand	0.9686	85337.35869	12614.61	10760.6	6281.63	0.6100	-4.84282	35644.75	1460.8	23322.98	97.75372	
Norway	1.0771	560376.8221	28447.1	15871.42	11798.69	0.7200	3.525888	24283.11	2010	23781.95	98.66509	
Portugal	1.1325	258226.5764	7874.774	13020	2050	0.6408	20.93671	14790.71	4857.4	21142.88	108.6177	
Spain	1.0131	242487.3635	13721.6	79570.6	27648.97	0.3539	8.715203	97346.85	12609.4	141769.5	104.8999	
Sweden	1.0582	203036.7394	28093.32	18084.82	48842.82	0.5469	5.193678	71171.12	4396	50879.68	106.672	
Switzer-land	1.0145	1051485.451	34866	35748.87	74413.67	0.6831	4.134957	28462.31	4075	66171.59	102.1374	
Turkey	1.1731	5981530	2664.23	11999	1249	0.2416	-0.61126	20262.04	19022	42194.96	99.32216	
United Kingdom	1.0986	312817.186	17051.71	208345.6	221678.7	0.4704	3.726422	213985.3	26305	176635.4	105.8793	
United States	1.0462	193090.383	22095.99	419108	502063	0.2121	2.380514	1027005	117718	971452	103.4906	
Australia	0.9998	231771.7006	18892.68	75777.77	40509.45	0.6996	-6.39432	37358.16	7612.2	47610.4	97.16732	1992
Austria	1.0829	579519.7419	22493.34	12040.11	7974.403	0.6996	-3.26379	25123.81	3546.7	47610.4	111.2705	
Belgium	1.0133	150194.661	20964.96	13000	14000	1.2977	-3.71855	49033	3772.5	48089.55	110.5975	
Canada	1.0956	110223.4576	20276.19	108502.9	92467.52	0.5456	-4.99085	139640.5	12842	103140.9	100.692	
Denmark	1.098	1375425.024	27146.63	14387.3	15799.2	0.6946	-6.72925	37946.15	2652.2	26843.84	107.0343	
Finland	1.1605	2062247.491	25017.86	3688.847	9177.976	0.5090	-17.5125	27939.13	2233	20484.8	87.50734	
France	1.0799	111838.1204	21653.16	127883.3	158750.4	0.4297	-5.46669	313644.5	22001.5	274086.8	107.7265	

Germany	1.0681	6976.079399	22910.13	119965.3	186184.3	0.4861	-2.26087	403752.7	29782	482329.1	111.9487	
Greece	1.0517	54264.00996	9446.102	7959.8	2879.924	0.4565	-5.54715	15488.87	64360	23319.1	114.3508	
Iceland	1.0328	1265831.306	23641.95	123.2322	113.9145	0.6068	-15.1208	1477.773	136.9	1262.958	113.5408	
Ireland	1.1675	3767082.331	14253.47	40808.71	15569.11	1.1318	-9.39714	9536.945	63690	8668.471	107.6681	
Italy	1.1101	343893.2038	20311.03	49963.42	81067.96	0.3670	-20.3261	254523.1	21609	271219.5	109.1473	
Japan	1.1421	398629.399	25375.75	15511	259795	0.1764	17.34301	522312.7	64360	1166912	119.6003	
Korea, Republic of	1.0678	2176.850436	6991.442	6885.361	5441.274	0.5142	3.705708	40874.13	19033	126413.3	107.9797	
Mexico	1.0887	267597.1841	3273.916	35680	3386.283	0.3235	11.23221	37715.97	31000	103687.5	128.15	
Nether-lands	0.9566	128298.961	20276.25	74439.7	120122.6	1.7572	-4.16904	509.2489	6597	633.2091	109.4456	
New Zealand	1.0576	102895.5752	12529.75	12544.6	4430.723	0.6637	2.109598	31278.19	1466.6	20244.81	92.91091	
Norway	0.9978	612573.2747	29290.61	13647.19	12609.74	0.6901	-10.6212	25146.19	2004	24334.38	102.191	
Portugal	0.958	267597.1841	7955.805	14893	2198	0.5977	-12.7656	17864.04	4586.7	24707.93	129.5544	
Spain	1.1187	252610.0913	13810.8	107839.6	29996.65	0.3590	-18.0664	111978.6	12822.3	143352.7	113.6151	
Sweden	1.0285	213862.7085	27562.33	14056.51	45522.97	0.5435	-25.641	76672.76	4209	48327.15	111.8656	
Switzer-land	1.0222	1090253.456	34548.47	32989.9	91570.8	0.6788	-2.71938	30679.83	4016	60072.11	106.2724	
Turkey	0.9901	6323723	2774.522	12843	1263	0.2516	4.899918	22198.64	19085	46665.05	98.7109	
United Kingdom	0.9692	312793.7656	17040.27	172986.3	245629	0.4803	-13.441	226382.5	25728	173161.6	109.6057	
United States	1.0906	188278.4549	22565.97	423131	564283	0.2136	2.43777	1057487	118492	1038326	105.8711	
Australia	0.9778	221825.2995	19447.22	82889.72	47774.08	0.6551	8.024598	38030.69	7644.8	44768.18	90.77299	1993

Austria	1.8317	563676.1194	22391.62	12105.77	9623.482	0.6551	4.932842	31029.02	3575.5	44768.18	108.0067	
Belgium	0.9599	140625.7796	20697.31	14000	15000	1.2294	5.956523	47532.41	3745.5	44679.88	106.879	
Canada	0.921	87353.63557	20520.58	106867.8	104302.1	0.6042	-4.257	132676.9	13014.7	100595.8	95.70117	
Denmark	1.0199	1293702.061	27026.92	14617.9	19612.86	0.6804	3.513782	37183.88	2584.4	22841.98	100.3051	
Finland	1.0645	2004389.959	24657.25	4216.613	12533.94	0.5885	7.58677	21133.74	2099	13848.72	69.99485	
France	0.9819	104710.2798	21364.32	135077.9	182326.8	0.4114	3.452143	311381	21713.9	226441.4	102.2598	
Germany	1.1591	6126.457214	22592.73	116133.9	225734.8	0.4459	4.722465	393538.8	29397	444347.4	109.6879	
Greece	0.9238	50861.51082	9193.714	8936.8	2895.71	0.4354	5.508057	15093.34	64500	20777.96	108.8036	
Iceland	0.9779	1020950.862	23723.88	116.8706	149.2094	0.6238	-0.81789	1328.368	136.6	1036.077	98.41996	
Ireland	1.0013	4324015.954	14550.84	41886.6	16005.82	1.2048	2.953798	8839.855	64360	7554.645	98.27098	
Italy	0.9264	377512.6039	20109.04	53949.48	89629.15	0.3953	0.941615	203794.5	20705	192625.9	88.82127	
Japan	1.033	442028.8198	25340.85	16884	275574	0.1611	12.18264	620500.7	64500	1279729	136.9434	
Korea, Republic of	1.1366	2319.904085	7367.649	7431.627	7470.629	0.4984	8.634549	44098.57	19328	132967.2	111.6854	
Mexico	0.9995	202145.0278	3275.141	40600	4444.283	0.3136	-0.07357	46454.29	32832.7	103653.5	139.3822	
Nether-lands	1.0413	118167.8512	20397.24	74478.1	142953.5	1.6848	4.374305	588.8155	6648	584.9375	105.2766	
New Zealand	1.0172	90861.55394	13084.5	15539.1	5896.214	0.7044	11.12082	28066.32	1495.8	18349.68	95.0205	
Norway	1.0029	509851.8509	29938.75	13620.64	17731.44	0.6944	0.282217	23996.6	2004	23131.66	91.56978	
Portugal	1.057	202145.0278	7782.767	16427	2485	0.5751	4.580186	16322.1	4493.1	19368.83	116.7889	
Spain	0.8882	245760.1507	13627.14	100298.6	29060.61	0.3693	-1.25539	96024.78	12293.8	106411.8	95.54877	
Sweden	0.9892	242531.2741	26825.64	13126.99	60309.59	0.6185	3.077818	58215.1	3964	30583.06	86.22461	
Switzer-land	1.0479	979172.2805	34141.45	38713.69	112585.9	0.6719	9.736835	29382.72	3983	54969.8	103.553	

Turkey	0.9366	6643991	2945.561	13479	1312	0.2597	-24.2518	25496.25	18047	61234.5	103.6108	
United Kingdom	1.1354	355750.4687	17377.39	179232.7	276743.8	0.5158	3.521466	196448.3	25317	151970	96.1647	
United States	1.0189	201203.1982	22900.96	467412	612893	0.2148	2.288577	1073757	120259	1129481	108.3089	
Australia	0.928	241745.2171	20094.58	95519.41	53009.06	0.6836	3.646139	40921.44	7904.3	49102.09	98.79759	1994
Austria	0.6701	564478.15	22828.44	14804.27	11831.72	0.6836	17.50947	32709.47	3742	49102.09	112.9396	
Belgium	0.9734	153594.3816	21301.96	15000	16000	1.2770	16.78334	51586.7	3754.95	48871.61	112.8355	
Canada	0.8194	100284.3681	21280.44	110203.9	118105	0.6683	1.602299	125648.2	13291.7	106530.4	91.44417	
Denmark	0.8723	1366998.193	28411.87	18083.2	24702.5	0.7014	15.53147	39201	2554.9	27072.34	103.8188	
Finland	0.9696	2146238.272	25413.62	6714.033	14993.35	0.6381	19.63684	23564.32	2080	16890.68	77.58162	
France	0.9451	112211.3518	21748.78	163446.9	204431	0.4283	13.4096	324628.5	21750	250534.1	105.7119	
Germany	0.8445	6294.80182	23074.76	139153.5	268419.3	0.4604	17.5689	418116.2	36048	482294.4	114.4103	
Greece	1.0025	55405.73171	9280.649	9917.8	2937.305	0.4254	17.12007	15576.14	64530	20983.97	114.3117	
Iceland	1.0667	1053976.841	24346.04	126.7204	179.7026	0.6638	11.0881	1357.257	137.7	1007.519	97.60207	
Ireland	1.0084	4760419.187	15281.5	42743.58	16826.69	1.3069	10.57816	9535.814	64500	8785.457	101.2248	
Italy	0.9979	441416.5728	20527.28	60376.11	106323.1	0.4228	3.50381	202936.4	20373	197573.5	89.76289	
Japan	1.0442	461300.8998	25527.61	19211	238452	0.1617	12.10162	700218.5	64530	1349838	149.126	
Korea, Republic of	1.0604	2492.785944	7940.235	8226.964	10230.54	0.5112	14.2779	49853.19	19905	160797.4	120.32	
Mexico	0.7636	217623.8373	3356.498	33197.7	4181.283	0.3505	-38.3388	50803.96	33000	111870.4	139.3086	
Nether-lands	1.0545	124519.521	20865.6	93409.1	172672	1.6620	17.20158	622.8183	6692	582.098	109.6509	
New Zealand	1.0039	95335.97847	13536.11	22062.17	7675.623	0.7031	13.65453	28188.19	1559.5	19758.35	106.1413	

Norway	1.0316	515144.1734	31273.81	16282.17	22519.39	0.7017	13.58565	26354.49	2035	24707.89	91.852	
Portugal	0.9784	217623.8373	7843.099	17697	3574.253	0.6070	16.52881	17181.95	4481.8	21061.67	121.3691	
Spain	0.929	272170.7001	13909.81	93147.64	34635.59	0.4164	12.00685	93936.59	12207.6	108457.9	94.29338	
Sweden	0.9752	175628.2021	27722.61	22649.6	73182.84	0.6780	10.82837	60559.2	3928	35437.67	89.30243	
Switzer-land	1.0025	1059483.303	34242.91	48667.48	142479.3	0.6696	18.71991	32218.54	3955	64294.06	113.2898	
Turkey	1.2199	7060147	2736.721	14087	1425	0.3347	16.58723	16514.99	19401	34500.65	79.35898	
United Kingdom	1.0051	384085.6317	18076.71	189587.5	304865	0.5331	5.864254	207302.7	26000	171610.7	99.68617	
United States	0.8184	238330.4327	23546.13	480667	699015	0.2253	2.267794	1102446	123060	1278594	110.5975	
Australia	1.0758	284324.9784	20693.19	104074.4	66816.14	0.7069	7.151974	48747.78	8218.2	59168.02	102.4437	1995
Austria	1.2116	590499.7726	23143.08	19720.49	13059.97	0.7069	-5.0172	37358.16	3758.8	59168.02	130.4491	
Belgium	1.1667	181985.5894	21752.59	16000	17000	1.3125	-5.53663	61246	3794.9	56900.03	129.6188	
Canada	1.0972	130600.9096	21658.14	123181.2	132329.1	0.7146	2.127007	125658.6	13295.4	110771.3	93.04647	
Denmark	1.0197	1573017.037	29166.7	23800.9	27622.17	0.7119	-1.72604	45907.03	2609.7	35499.28	119.3503	
Finland	1.0723	2522623.668	26300.46	8464.645	17665.76	0.6514	-4.9882	29755.43	2128	23170.65	97.21846	
France	1.1268	131725.84	22121.27	191433.7	231094.3	0.4441	-1.01929	372608.6	21954.4	291966.8	119.1215	
Germany	1.0193	7018.106402	23417.43	165914.2	290837.4	0.4744	-5.65354	493784.4	35982	560587.6	131.9792	
Greece	1.108	67091.66721	9391.176	10970.8	2911.937	0.4364	4.345222	20352.83	64570	24289.95	131.4317	
Iceland	1.0445	1126076.952	24140.24	129.0817	240.7086	0.6744	-0.33938	1547.665	141.8	1146.9	108.6902	
Ireland	1.0591	5247610.125	16628.24	44186.51	17554.65	1.4062	2.29379	10945.28	64530	12158.13	111.8029	
Italy	1.0438	539073.8092	21105.39	65349.97	117341.1	0.4767	10.32266	202254	20233	223356.5	93.2667	
Japan	1.0918	313728.2092	25946.54	33531	258612	0.1692	-22.6084	793788.4	64570	1491725	161.2276	

Korea, Republic of	0.9902	2571.313266	8604.317	9497.42	13827.9	0.5560	1.054368	59594.86	20432	200155.7	134.5979	
Mexico	1.1783	253706.424	3092.388	41129.6	4219.283	0.5300	10.54415	31237.66	32652.2	69440.74	100.9698	
Nether-lands	0.9747	148920.8633	21378.9	116049.1	194025.3	1.6674	-4.46846	650.0206	6835	621.851	126.8525	
New Zealand	1.016	112958.5181	13885.98	25727.61	9293.317	0.6994	7.30655	29162.73	1632.6	22485.45	119.7959	
Norway	1.0201	596753.9328	32400.72	18800.44	25440.43	0.6975	2.453879	33249.06	2079	29477.25	105.4376	
Portugal	0.9971	253706.424	8160.513	18981.53	4198.475	0.6361	0.699805	20265.06	4441.7	26305.96	137.8979	
Spain	1.0814	318376.6449	14251.73	104521.5	45100.26	0.4477	1.96379	107910.9	12512	130673.2	106.3002	
Sweden	1.2233	227606.7782	28704.71	31042.62	72132.73	0.7274	7.303015	67522.62	3986	42901.79	100.1308	
Switzer-land	0.9673	1155629.076	34116.42	57062.84	141590.8	0.6674	-5.46572	37675.76	3952	74462.58	132.0097	
Turkey	0.8639	7387641	2883.262	14972	1535	0.3505	0.150361	19818.01	19893	53027.91	95.94621	
United Kingdom	1.0561	427039.4069	18556.96	199771.8	330432.6	0.5668	2.406143	225656	27660	193195.8	105.5504	
United States	0.9664	234157.1417	23849.14	535553	795195	0.2397	2.144807	1131793	124900	1340514	112.8653	
Australia	0.9574	275432.7422	21270.01	116724.1	71935.25	0.7270	-4.33745	47722.56	8324.2	57923.96	109.5957	1996
Austria	0.9932	613775.8975	23675.19	19629.37	14010.95	0.7270	-16.6712	38030.69	3709.8	57923.96	125.4319	
Belgium	0.9711	184437.0679	21963.87	17000	18000	1.3535	-15.5333	60570.73	3791.88	53889.44	124.0822	
Canada	0.96	128476.0737	21798.47	132977.5	152968.3	0.7275	-0.32504	125533.5	13421.4	111632.2	95.17347	
Denmark	0.9601	1576825.049	29870.64	22340	28127.7	0.7096	-12.2975	46852.11	2627.3	35110.8	117.6243	
Finland	0.8929	2438564.677	27179.67	8797.347	20297.38	0.6686	-8.82237	29846.76	2158	21614.6	92.23026	
France	0.8775	139290.1368	22281.62	200156.4	237271.1	0.4488	-13.5479	377217.4	22036.4	278287	118.1022	

Germany	1.0251	7330.962406	23587.73	162513.5	308839.4	0.4889	-16.3849	483182	35805	514778.9	126.3257	
Greece	0.9137	74085.366	9543.103	12028.8	3067.6	0.4415	-7.97347	20403.25	64860	26883.56	135.777	
Iceland	0.7961	1259660.34	25044.99	199.3572	271.5849	0.7196	-3.69772	1606.782	142	1389.218	108.3508	
Ireland	0.9529	4635653.364	17850.64	46803.99	18354.58	1.4239	-1.71896	11536.66	64570	14497.7	114.0967	
Italy	0.9313	581320.0852	21270.62	74640.08	139546.1	0.4479	-7.3531	229978.6	20320	241441	103.5894	
Japan	0.7656	364346.7277	26589.03	29940	271904.6	0.1915	-13.2446	710992.6	64860	1340506	138.6192	
Korea, Republic of	0.8055	2691.843575	9133.978	11509.56	16821.5	0.5603	-15.6423	66664.5	20817	222751.4	135.6523	
Mexico	0.9369	276186.1316	3193.881	46912	5327.283	0.5667	14.46488	33496.58	33968.6	94014.08	111.514	
Nether-lands	0.8062	160158.0926	21969	126542.7	198554.6	1.6312	-13.8531	676.0894	6971	796.4804	122.384	
New Zealand	0.8525	117640.0032	14201.05	34743.69	5646.559	0.6346	-2.36981	37955.48	1687.5	27913.9	127.1024	
Norway	0.8594	622468.4388	33864.28	21001.16	27967.25	0.7261	-6.75729	33687.98	2131	32358.48	107.8915	
Portugal	0.8898	276186.1316	8433.773	21118.14	5741.852	0.6331	-11.9989	21387.66	4467.2	27700.41	138.5977	
Spain	0.9152	307253.1135	14558.01	119766.3	53050.19	0.4671	-12.3726	111974.8	12817.5	135105.2	108.264	
Sweden	1.0265	243933.0383	29061.11	34835.1	78151.58	0.7053	-11.6125	75316.93	3963	45093.35	107.4338	
Switzer-land	0.8228	1220515.769	34155.35	53918.23	165364.6	0.6822	-18.9052	36785.64	3950	69416.7	126.544	
Turkey	0.8292	7810487	3032.779	15694	1786	0.3901	-2.58473	22785.33	20388	54772.34	96.09657	
United Kingdom	0.9606	428515.3409	19021.61	228642.6	360796.3	0.5841	8.627042	232031.9	27967	205874.6	107.9566	
United States	1.0423	206873.921	24437.02	598021	871316	0.2423	1.954746	1167913	126708	1449646	115.0101	
Australia	0.9677	249414.8731	21979.24	101042.4	78635.05	0.7937	-16.0932	40231.61	8391.3	51459.38	105.2583	1997

Austria	0.9585	637528.7986	24077.26	19521.68	17468.06	0.7937	-1.17196	40921.44	3719.4	51459.38	108.7607	
Belgium	0.8937	170436.363	22692.64	18000	19000	1.4355	0.650865	53540.12	3839.17	50904.84	108.5489	
Canada	0.9187	123206.3679	22513.26	135943.6	171779.8	0.7702	-6.69852	124045.9	13706	132181	94.84844	
Denmark	0.9235	1427242.272	30696.68	22267.8	38876.85	0.7390	-0.28198	42551.4	2682	35468.46	105.3268	
Finland	0.8951	2160569.896	28756.85	9529.766	29407.38	0.6934	0.411517	27473.36	2194	23052.52	83.40789	
France	0.8855	135879.28	22695.62	195863.6	288069.9	0.4850	-0.17968	340749.7	22166.6	248148.9	104.5543	
Germany	0.9623	7422.992231	23979.47	158832.1	372492.5	0.5370	-0.99552	418978.5	35860	456142.6	109.9408	
Greece	1.0258	81153.18804	9832.585	13012.8	2792	0.4790	-3.58056	20739.17	65570	26607.69	127.8035	
Iceland	1.0305	1192358.39	25987.52	335.9102	342.2389	0.7194	4.896097	1609.381	142	1461.519	104.6531	
Ireland	1.0534	4258577.791	19705.79	48939.92	20313.46	1.4573	0.557889	12138.15	64860	17163.26	112.3778	
Italy	0.9157	538206.0158	21698.83	85468.45	176963	0.4659	0.605276	218379	20413	230813.4	96.23626	
Japan	0.9461	439481.2192	26947.25	27079.65	270034.6	0.2065	-9.46042	652636.9	65570	1207876	125.3746	
Korea, Republic of	0.7623	2777.219433	9480.214	14151	20293.1	0.6188	-33.8052	61359.28	21106	190836.5	120.0099	
Mexico	0.9866	252393.9374	3350.904	55810	6009.681	0.5533	-0.00814	41501.59	35924.8	126931.9	125.9788	
Nether-lands	1.0057	158223.0424	22768.98	122192.7	229000.1	1.4250	0.264768	721.3461	7194	690.1739	108.5309	
New Zealand	0.8488	111953.4151	14298.6	31507.18	5490.835	0.6396	-22.461	44836.56	1735.9	35678.79	124.7326	
Norway	0.9151	572661.1686	35492.76	22485.89	23719.21	0.7451	-7.05196	36959.03	2194	34747.64	101.1342	
Portugal	0.9745	252393.9374	8760.044	22392.51	10225.07	0.6519	1.253092	20278.81	4546	28663.92	126.5988	
Spain	0.8974	266880.1742	15082.3	105295.5	74133.45	0.5174	0.416862	100058.7	13345.6	126351.8	95.89145	
Sweden	1.1205	255243.1829	29761.7	41453.6	93573.5	0.7673	-3.26305	67498.64	3922	40279.93	95.8213	
Switzer-land	1.0263	1358947.156	34742.06	59518.93	184232.3	0.7501	0.422539	31188.83	3951	59309.88	107.6388	

Turkey	0.8665	8304986	3206.173	16499	2153	0.4352	2.177425	25260.7	20362	58617.91	93.51184	
United Kingdom	0.9488	381799.3356	19558.6	252958.6	488372.1	0.5668	4.49657	246632.4	28468	233943.3	116.5836	
United States	1.0451	212145.8297	25229.84	681842	1000703	0.2503	1.30286	1206599	129558	1614750	116.9648	
Australia	1.0589	255131.0823	22860.89	105944.4	89556.2	0.8166	4.306003	41054.81	8572.3	52550.31	89.1651	1998
Austria	0.9315	616781.7793	24920.47	23564.24	19126.87	0.8166	-3.8218	48747.78	3723.3	52550.31	107.5887	
Belgium	1.1792	173653.201	23032.58	19000	20000	1.4505	-4.14826	54395.34	3857.47	52252.68	109.1998	
Canada	1.2156	130237.03	23227.5	143344.7	201434.2	0.8088	1.401668	120877.3	14046.2	125747.7	88.14991	
Denmark	1.094	1474678.247	31228.61	35693.89	51332.65	0.7432	-2.45068	44488.84	2692.4	37399.56	105.0448	
Finland	1.1459	2184474.594	30179.68	16455.06	33849.52	0.6803	-2.8416	27958.16	2247	25810.87	83.81941	
France	1.1273	136514.8739	23399.73	246214	334096.8	0.4993	-4.31924	340602.6	22694.6	275868.9	104.3747	
Germany	1.1917	8291.725191	24452.1	206776.4	413394.6	0.5595	-4.14814	418315.5	36402	472033.2	108.9453	
Greece	1.1861	88116.38434	10116.1	13084	3935	0.4929	-0.47434	21048.09	65140	28439.5	124.2229	
Iceland	1.1885	1217117.061	27375.07	465.9983	454.4728	0.7387	1.391431	1838.431	147.9	2001.484	109.5492	
Ireland	1.1334	3856551.243	21082.21	62450.23	25231.54	1.6183	-0.93884	12511.04	65570	20297.96	112.9357	
Italy	1.1534	360101.1496	22035.44	108821.6	181851.7	0.4729	-3.10406	220447.5	20618	238815.3	96.84154	
Japan	1.1764	461558.2734	26345.63	26064.01	248776.9	0.1994	15.58077	613451.1	65140	1012702	115.9142	
Korea, Republic of	1.6096	2807.531166	8757.845	19223.29	23333.6	0.7517	15.31675	45490.34	19994	88730.1	86.20472	
Mexico	1.3018	253097.4046	3460.785	63610.4	7910.232	0.5787	12.62366	45726.77	36871.7	125353.6	125.9707	
Nether-lands	1.1582	151139.2	23521.55	164473.2	260874.5	1.4809	-2.60059	664.3213	7435	786.038	108.7957	
New Zealand	1.2083	118547.1449	14245.83	33190.54	7006.237	0.6354	-0.4725	49475.91	1725	42239.81	102.2716	

Norway	1.1443	600849.3123	36241.87	25618.42	29814.17	0.7346	2.955996	40300.08	2248	37762.8	94.08227	
Portugal	1.1412	253097.4046	9152.1	30088.81	11492.83	0.6684	-1.49805	21647.62	4857	32183.74	127.8519	
Spain	1.1444	275109.6313	15702.84	126059.5	118040.5	0.5355	-1.7603	104022.3	13904.2	140919.1	96.30831	
Sweden	1.2206	269262.0543	30907.05	51002.65	106249.6	0.7961	-2.67977	68251.57	3979	43065.49	92.55825	
Switzer-land	1.1036	1455892.099	35563.63	71995.13	194584.7	0.7635	-3.11788	31122.44	4006	64816.67	108.0613	
Turkey	0.9925	8752441	3250.7	17439	2798	0.4152	-3.01648	27606.68	20872	59543.31	95.68927	
United Kingdom	1.105	416179.8768	20157.49	337386.2	686420.1	0.5385	-0.14953	259165.1	28651	267382.7	121.0802	
United States	1.1762	210923.9792	25969.66	778418	1215960	0.2454	1.722633	1246905	131463	1747673	118.2677	
Australia	0.9812	253825.9926	23500.97	120588.8	85385.45	0.8347	-5.42822	41640.17	8720.2	52114.62	93.4711	1999
Austria	0.9096	661250.6296	25720.46	23471.09	24820.64	0.8347	-12.446	47722.56	3762.3	52114.62	103.7669	
Belgium	1.0079	173943.2703	23768.92	20000	21000	1.4631	-12.5257	54603.14	4006.88	53562.26	105.0515	
Canada	0.9894	130706.8345	24291.04	174990	237639	0.8271	3.739579	125227.2	14406.7	134248.3	89.55158	
Denmark	0.9756	1460321.573	31898.79	47642.86	44981.47	0.7636	-11.3941	44776.27	2707	34503.69	102.5941	
Finland	0.9007	2143555.863	31286.19	18320.29	52109.17	0.6747	-9.11721	27677.65	2317	24737.19	80.9778	
France	0.9098	140643.8536	24066.72	244668.3	445091.1	0.5019	-12.3176	338102.8	23080.2	282307.3	100.0554	
Germany	0.8446	8742.606422	24935.13	235259.2	541861	0.5793	-14.7858	412559.9	33604	460576.9	104.7971	
Greece	0.9529	96418.35724	10421.68	15890	6093.8	0.5473	-16.72	21878.92	64620	30914.89	123.7486	
Iceland	0.9578	1200785.476	28222.7	477.7395	663.1641	0.7186	-5.14861	2005.536	153.3	1906.151	110.9406	
Ireland	0.9991	4368738.11	22998.25	72815.42	27925.26	1.6423	-9.7999	13267.89	65140	22730.85	111.9968	
Italy	0.8935	464313.3676	22462.06	108638.5	180275.2	0.4709	-11.0374	218903.7	20864	240894.3	93.73747	
Japan	1.0533	526888.7386	26263.69	46115.46	278442.1	0.1897	5.084647	721705.8	64620	1085528	131.495	

Korea, Republic of	1.0125	2788.482816	9514.687	29106.22	26833.2	0.6760	5.979707	56388.92	20281	133294.7	101.5215	
Mexico	1.0294	257063.7728	3534.73	78060	8273.376	0.5755	18.53665	55333.06	37279.9	138127.3	138.5944	
Nether-lands	0.866	159045.8645	24481.35	192228.2	305461.1	1.5670	-10.5746	658.2969	7613	780.0715	106.1951	
New Zealand	0.8501	121658.7275	14878.38	32875.38	8491.035	0.6404	-11.5805	52567.73	1766.3 3	48938.37	101.7991	
Norway	0.9942	617861.8659	36766.52	29429.69	34026	0.7143	2.40333	36474.9	2259	34890.12	97.03827	
Portugal	0.9307	257063.7728	9463.024	26910.42	19793.15	0.6601	-13.7751	22647.43	4921.6	33818.11	126.3538	
Spain	0.9111	270883.7016	16360.43	125360.9	129193.6	0.5519	-9.96223	106129.5	14689.8	155221.4	94.54801	
Sweden	1.0215	249761.6577	32324.87	73300.82	123256	0.7988	-7.63586	69185.35	4068	44470.1	89.87848	
Switzer-land	0.8838	1502661.135	35933.2	75994.87	232160.7	0.7855	-10.5406	30243.23	4038	61090.66	104.9434	
Turkey	1.1435	9277902	3048.113	18222	3668	0.3873	0.37407	30543.27	21413	47763.72	92.67279	
United Kingdom	0.9844	399612.3282	20706.46	385145.9	897845.4	0.5372	-6.37349	274492.6	29037	271837.5	120.9307	
United States	0.9832	191200.3323	26807.41	955726	1316247	0.2507	2.644401	1327129	133488	1886464	119.9903	
Australia	1.0318	231933.6712	23675.62	111138.7	109602.3	0.9108	-7.24953	36567.87	8951.3	46808.79	88.04288	2000
Austria	0.5852	724915.9995	26516.96	31164.88	28510.59	0.9108	-1.06163	40231.61	3776.5	46808.79	91.32092	
Belgium	0.9319	160081.272	24592.04	21000	22000	1.6635	-0.83686	49454.54	4092.17	50631.06	92.52587	
Canada	1.046	121796.4792	25321.77	212715.6	250692.6	0.8540	-2.83262	134726.7	14764.2	146656.5	93.29116	
Denmark	0.9981	1330608.906	32898.9	45916.45	45825.32	0.8707	-0.41543	40219.37	2722.1	33908.09	91.19998	
Finland	0.9697	1900219.658	32780.35	24272.57	52225.24	0.7746	0.047747	24781.63	2356	24548.53	71.86059	
France	0.9177	127087.941	24881.28	259775.4	508861.5	0.5623	-0.8327	304712.5	23689.3	272319.8	87.73777	

Germany	0.9342	8697.306704	25721.52	271610.7	617760.6	0.6640	-1.536	361074	36816	413837.9	90.01138	
Greece	0.9585	96595.65092	10851.63	14112.8	7020.42	0.6322	-1.5436	22634.13	64460	29633.99	107.0286	
Iceland	1.0372	1097345.758	29177.05	497.4734	842.8363	0.7443	-13.068	2037.157	156.4	2020.811	105.792	
Ireland	0.9716	4667449.302	24795.22	127088.7	40819.08	1.8273	2.398205	13314.44	64620	23123.16	102.1969	
Italy	0.9309	533385.2068	23231.58	121169.8	182374.9	0.5318	0.022414	202439.5	21225	227094.9	82.70012	
Japan	1.0245	636731.3487	26971.01	50322.02	300113.8	0.2052	-16.9575	788208.7	64460	1187402	136.5796	
Korea, Republic of	0.9779	2856.44203	10251.21	38109.8	19970	0.7427	-9.99469	63752.09	21156	163015.1	107.5012	
Mexico	1.0709	245571.6044	3713.656	97170.2	12077.5	0.5825	11.16789	67673.88	38044.5	169123.3	157.131	
Nether-lands	1.0716	168287.6216	25304.26	243732.6	332154.2	1.5002	1.988112	663.4892	7798	779.1813	95.62053	
New Zealand	1.0514	112649.8122	15088.68	24893.8	7174.851	0.6047	-3.70084	65759.54	1800	56760.37	90.21853	
Norway	1.0877	580673.0386	37741.77	30265.02	37466	0.7596	-0.41314	34278.17	2269	30999.99	99.4416	
Portugal	1.0016	245571.6044	9785.047	32043.19	22264.94	0.7041	0.773936	21764.95	5032.9	31196.59	112.5788	
Spain	0.9593	252396.3338	17049.58	156348.2	143580.3	0.6120	1.018418	99834.09	15505.9	152586.9	84.58578	
Sweden	0.9995	266559.6451	33700.75	93995.08	123275.5	0.8689	-7.61015	63862.08	4159	44922.95	82.24262	
Switzer-land	1.0529	1477511.641	37045.81	86804.22	252236.7	0.8714	0.820832	27992.71	4080	58622.85	94.40279	
Turkey	1.039	9834008	3222.325	19204	4581	0.4319	-19.5632	31257.83	21851	55355.9	93.04685	
United Kingdom	1.0626	380520.2379	21418.84	438631	869700.4	0.5710	-3.16054	275326.8	29509	260913.8	114.5572	
United States	1.1203	190154.0031	27483.83	1256867	1460352	0.2713	2.955402	1411822	135208	2012959	122.6347	
Australia	1.0039	231660.5668	24268.64	111739.2	114888.2	0.9471	6.62346	35899.72	9060.839	45097.67	80.79335	2001

Austria	0.8799	715442.9374	26624.35	34999.31	42484.66	0.9471	6.026019	41054.81	3799.6	45097.67	90.25929	
Belgium	1.0085	160475.7043	24704.05	22000	200970	1.6608	6.526908	50449.66	4051.198	47468.93	91.68901	
Canada	1.081	125089.7084	25518.69	213756.8	275698.9	0.8134	-0.21026	136693.8	14946.2	137231	90.45854	
Denmark	1.0442	1342426.75	33014.83	43458.97	57412.93	0.8783	7.127228	41243.61	2725.1	32679.08	90.78455	
Finland	1.0504	1890953.996	33564.43	24070.26	63933.2	0.7332	4.681382	25534.45	2388	24669.13	71.90834	
France	1.0834	131030.5948	25194.34	295323	586367.4	0.5509	6.670561	305943	24145.5	269484.2	86.90508	
Germany	0.9749	7922.978114	26017.87	272153	695765.5	0.6761	5.89812	358144.4	36536	368542.6	88.47538	
Greece	1.0586	104687.2064	11306.37	13941.25	9000.988	0.6122	9.555606	22755.5	64120	30405.99	105.485	
Iceland	1.117	1117350.18	30064.25	686.2749	1257.334	0.7866	11.36057	1866.346	159	1685.478	92.72396	
Ireland	1.118	4095485.152	25865.14	134052.5	58882.38	1.8432	10.33593	15268.05	64460	23742.25	104.5951	
Italy	1.0393	504584.0691	23570.14	113434.5	194496	0.5281	7.216452	211950.7	21634	229951.4	82.72253	
Japan	0.9538	681762.3728	26977.84	50318.66	304236.9	0.2049	-5.47356	716886	64120	1013808	119.6221	
Korea, Republic of	1.1272	2898.759492	10581.34	53210	20730	0.6922	5.949138	64299.26	21572	147146.4	97.50649	
Mexico	1.099	225205.287	3664.217	140358.6	12868.7	0.5225	5.898252	76404.85	38065.8	158590.8	168.2989	
Nether-lands	1.1059	170923.7223	25653.14	282881.7	396530.1	1.5431	8.975857	490.9162	7953	1047.576	97.60864	
New Zealand	1.1028	115711.1793	15478.36	20925.4	9425.379	0.5469	8.711234	71171.12	1845.8	50879.68	86.51769	
Norway	1.1162	609102.3794	38265.16	32669	47076	0.7459	10.52343	32471.22	2278	31011.98	99.02845	
Portugal	1.0985	225205.287	9924.46	36023.23	21325.2	0.6781	10.56933	22761.14	5121.7	31347.73	113.3527	
Spain	1.0664	257479.2803	17478.91	177253.6	163588.9	0.5957	8.306848	103972.2	16146.3	160522.1	85.6042	
Sweden	1.0252	196007.1955	33957.43	91941.99	146507.1	0.8631	5.816883	59537.7	4239	39959.1	74.63246	
Switzer-land	1.1191	1470986.317	37235.63	88765.69	292203.8	0.8693	8.367171	29758.39	4146	59386.53	95.22362	

Turkey	1.2374	10147524	2937.284	19677	5847	0.5076	12.63967	24297.69	21524	29549.66	73.48364	
United Kingdom	1.1406	424693.538	21841.17	506685.6	994136.3	0.5654	8.192816	280116	29824	256770.6	111.3966	
United States	1.0717	205964.5727	27394.69	1343987	1616548	0.2491	2.21972	1497456	135073	1910499	125.5901	
Australia	0.9512	251895.5157	24720.39	141136.1	161949.4	0.9332	20.55098	38362.09	9245.777	45431.39	87.41681	2002
Austria	2.4071	734656.5547	26703.27	44895.47	55961.32	0.9332	20.5524	41640.17	3835.7	45431.39	96.28531	
Belgium	0.9814	173880.8994	24978.86	229513	306288	1.6038	21.49352	56753	4069.833	48422.12	98.21592	
Canada	0.931	135342.1245	25995.15	225892	318954.7	0.7871	14.15935	143009.9	15310.4	141752.6	90.24828	
Denmark	0.9735	1460303.339	33062.33	53116.36	68608.6	0.8862	21.35795	45626.98	2715.3	35484.76	97.91178	
Finland	0.9753	2017012.506	34031.27	33987.07	76049.58	0.7138	14.88842	28570.85	2393	24817.62	76.58972	
France	1.0101	147395.1855	25287.07	385178.8	724219	0.5252	20.75105	341533.7	24316.4	276966	93.57564	
Germany	0.9045	8907.213121	25990.62	297785.2	830718.6	0.6689	20.139	387557.6	36172	348406.6	94.3735	
Greece	1.0008	122525.8066	11720.33	15560.6	12336.98	0.5569	27.70038	26969.32	63300	32880.66	115.0406	
Iceland	1.0263	1218980.724	29804.61	797.8655	1733.427	0.7331	21.05555	2259.265	156.7	1620.852	104.0845	
Ireland	1.0957	3918332.894	27056.69	182897.4	73322.17	1.7082	26.33794	18361.65	64120	27069.65	114.9311	
Italy	0.9418	575929.7572	23535.99	130819	238887.5	0.5049	21.21809	234137.3	21922	257565.8	89.93898	
Japan	0.9542	711103.0668	27008.14	78140.12	335499.5	0.2142	7.335905	704258.7	63300	903922.1	114.1485	
Korea, Republic of	0.986	2934.263036	11260.59	62660	24990	0.6478	8.122686	72680.96	22169	168153	103.4556	
Mexico	0.9447	248611.5167	3649.005	164080.4	16587	0.5056	-4.99296	82197.38	38939.7	163640.4	174.1971	
Nether-lands	1.0959	191927.5361	25540.38	349968.9	523206.4	1.4668	24.01872	512.7274	8018	868.5735	106.5845	
New Zealand	1.095	127460.7196	16059.46	30194.7	11883.31	0.5435	28.00424	76672.76	1906.2	48327.15	95.22893	

Norway	1.0174	686278.1575	38605.57	42781.06	57083	0.6888	17.65108	36304.61	2286	34312.07	109.5519	
Portugal	1.0945	248611.5167	9935.751	44636.74	34443.26	0.6425	29.37719	25545.68	5145.6	32149.31	123.922	
Spain	1.0097	281308.0721	17712.68	257105.7	221020.6	0.5678	23.37463	118015	16630.3	182756.3	93.91105	
Sweden	1.0723	232530.4849	34629.94	119367.5	185732.6	0.8235	18.31205	67577.45	4244	41883.62	80.44935	
Switzer-land	1.0815	1611999.98	37123.38	124805.3	341372.8	0.8217	17.49775	32972.41	4171	59837.66	103.5908	
Turkey	0.6935	10492427	3126.334	18795	6138	0.4880	19.83292	29600.93	21354	40958.04	86.12331	
United Kingdom	1.056	545653.5897	22194.11	523319.5	1187046	0.5478	14.67799	318599.5	29974	275281.1	119.5894	
United States	0.953	252024.1413	27550.56	1327170	1769613	0.2425	2.729863	1617133	136485	1894519	127.8098	
Australia	0.9522	310062.5352	25391.47	199340.7	203775.8	0.9370	19.03768	47522.89	9464.923	57788.06	107.9678	2003
Austria	1.0147	865906.682	26856.67	57636.38	69806.06	0.9370	14.34247	36567.87	3798.4	57788.06	116.8377	
Belgium	0.9568	212622.8684	25115.47	351499	370687	1.5753	15.15507	71342.62	4070.422	59215.55	119.7094	
Canada	0.9014	164547.8306	26206.7	289140.4	372670.3	0.7248	11.66083	170169.3	15672.3	173096.4	104.4076	
Denmark	0.9704	1803530.864	33090.96	65840.27	95113.5	0.8444	14.52505	56353.13	2692.5	41739.17	119.2697	
Finland	0.9685	2442118.015	34543.18	50256.53	85022.5	0.7014	9.805737	35831.58	2385	30450.29	91.47814	
France	0.9363	193457.551	25386.05	527583.2	845368.7	0.5012	13.451	427919.7	24325.3	339531.7	114.3267	
Germany	1.1238	10967.71164	25906.82	394512.5	925095.3	0.6732	12.88053	470467.2	356569	424836.9	114.5125	
Greece	0.9549	157377.6782	12286.08	22453.6	13791.27	0.5334	19.66977	33184.16	63160	47017.49	142.7409	
Iceland	0.9326	1507108.925	30360.64	1193.267	4039.728	0.7166	15.07017	2856.641	156.9	2169.407	125.1401	
Ireland	1.0244	4229098.16	27703.37	222837.3	106692	1.5161	17.34138	23806.87	63300	36588.21	141.269	
Italy	1.0085	643760.1377	23405.92	180890.6	280481.1	0.4856	14.67335	296762.8	22133	311483.5	111.1571	
Japan	0.9436	700323.1604	27354.34	89729.23	370543.6	0.2239	7.291141	763391.3	63160	966287	121.4844	

Korea, Republic of	0.9348	3019.639444	11556.33	66070	32170	0.6847	7.635305	83967.95	22139	192409.2	111.5783	
Mexico	0.905	311038.2627	3659.473	180555.3	21672.6	0.5217	4.498726	82847.57	39221.5	160313.9	169.2042	
Nether-lands	0.9541	225109.7777	25499.14	426610.9	587252.1	1.4413	14.13443	544.3582	7991	880.6484	130.6032	
New Zealand	0.9455	156407.1739	16409.69	44327.44	13957.1	0.6185	21.07174	58215.1	1955.6	30583.06	123.2332	
Norway	0.9616	883632.9675	38748.27	48967.07	80932	0.6762	13.47674	40903.97	2269	38996.12	127.203	
Portugal	1.0485	311038.2627	9790.546	60584.31	43940.69	0.6254	19.48595	31747.08	5127.7	35794.78	153.2992	
Spain	0.9924	328122.448	17994.06	339651.9	282294.4	0.5502	16.94047	153401.5	17295.9	241976	117.2857	
Sweden	1.0677	303008.2892	35111.92	158884.2	214586.8	0.8075	10.15961	85540.81	4234	51540.85	98.7614	
Switzer-land	0.9106	1860893.346	36755.22	162232.8	400589.6	0.8152	10.79662	39167.74	4156	68083.29	121.0885	
Turkey	0.8402	10987209	3263.057	33537	7060	0.4703	16.59311	36967.27	21147	53319.66	105.9562	
United Kingdom	0.928	660151.0201	22703.68	606157.6	1247190	0.5329	20.15779	380129.7	30264	311272.8	134.2674	
United States	0.836	289039.1313	27970.67	1395159	2160844	0.2453	3.753454	1741001	137736	1984103	130.5397	
Australia	0.974	359624.5181	25792.12	263389.4	175540.6	1.0001	11.05457	53835.96	9623.283	65673.58	127.0055	2004
Austria	1.0669	992229.8096	27304.9	70713.75	71806.89	1.0001	2.578073	35899.72	3744.0 3	65673.58	131.1802	
Belgium	0.9211	244728.1142	25738.36	466548	478170.2	1.6331	3.615831	81926.83	4139.2	72759.56	134.8645	
Canada	0.8887	188921.7932	26730.24	315262.5	388316.9	0.7253	12.73339	190156.3	15947	205622.6	116.0685	
Denmark	0.9994	2065523.497	33700.9	82504.74	110165	0.8584	4.126994	64934.79	2720.1	49825.6	133.7948	
Finland	0.9606	2745214.903	35726.83	57379.14	81860.51	0.7305	0.397019	41501.68	2387	35503.16	101.2839	
France	0.9133	230766.1743	25835.26	641760.9	868469.9	0.5132	2.420476	489911	24346.1	404038.6	127.7777	

Germany	1.0133	13233.60798	26160.8	512066.2	927459	0.7178	1.117444	516362.1	36566	470618.9	127.393	
Greece	1.009	184978.2397	12824.37	28481.53	13601.94	0.5399	5.564944	39346.38	63290	52273.69	162.4107	
Iceland	0.9538	1727825.272	32309.01	2087.893	10091.41	0.7386	20.58511	3318.941	156.1	3099.499	140.2102	
Ireland	0.9719	4605935.545	28331.25	207646.8	104152.2	1.5267	4.334943	28513.9	63160	45374.33	158.6104	
Italy	0.9433	721975.7811	23539.94	220720.3	293475.2	0.4999	3.027691	342997.3	22404	359363.8	125.8304	
Japan	0.9572	758223.93	28078.2	96984.25	386581.3	0.2467	-3.91758	826932.9	63290	1061126	128.7756	
Korea, Republic of	0.9774	3103.573227	12051.1	87770	38680	0.7761	13.84934	96154.59	22557	216106.7	119.2136	
Mexico	0.9277	357192.0645	3772.067	204214.2	29641	0.5509	16.08215	81596.56	40561	187349.5	173.7029	
Nether-lands	0.9222	258579.4536	25944.98	477218.9	615726.8	1.5367	3.236608	581.9583	7928	836.8234	144.7376	
New Zealand	0.9155	178959.8505	16859.34	52640.12	11584.46	0.6780	12.6764	60559.2	2024.1	35437.67	144.3049	
Norway	0.923	1044299.169	39963.74	79395	92923	0.7053	19.24894	51612.31	2276	46617.23	140.6797	
Portugal	0.888	357192.0645	9876.188	66970.55	41965.47	0.6464	4.82353	36935.8	5127.5	41371.06	172.7852	
Spain	0.9723	366446.2094	18312.57	407472.3	305426.6	0.5588	5.913201	185948	17970.8	295277.3	134.2262	
Sweden	1.0048	392156.0281	36362.86	196168.4	208776.9	0.8448	-0.8751	95597.75	4213	58563.02	108.921	
Switzer-land	0.8803	2198167.271	37407.97	197678.9	431980.1	0.8577	0.224262	43048.79	4169	77061.41	131.8852	
Turkey	0.825	11713709	3507.904	38523	8315	0.4974	14.48379	46861.03	21791	76039.34	122.5493	
United Kingdom	0.8965	738811.5324	23329.83	701913.4	1198637	0.5327	2.476001	460963.4	30543	375938.3	154.4252	
United States	0.9048	304000.6467	28708.47	1520316	2241656	0.2644	4.344612	1854665	139252	2218049	134.2931	
Australia	0.9817	375705.1186	26239	213529.5	225479.1	1.0407	4.634944	56130.55	9968.577	68911.61	138.06	2005

Austria	1.4915	1132754.196	27706.99	82551.39	105696.6	1.0407	3.548472	38362.09	3824.4	68911.61	133.7583	
Belgium	1.4459	257676.0365	26036.36	378156.4	618532	1.6950	3.93734	85875.24	4235.3	78187.34	138.4803	
Canada	2.4092	195331.5426	27270.32	341629.9	450312.4	0.7189	12.03008	214725.9	16169.7	248916.6	128.8019	
Denmark	38.5067	2150812.928	34638.01	94031.94	124626.6	0.9307	4.244847	67119.4	2732.8	53662.14	137.9218	
Finland	0.2843	2789633.388	36651.87	54801.84	96207.62	0.7929	2.153583	43640.25	2421	40250.21	101.6809	
France	0.1254	245790.4293	26106.72	628016.7	1044444	0.5298	4.127606	509157.5	24497.5	437170.5	130.1982	
Germany	0.1248	16302.83945	26357.64	475996.2	1081317	0.7682	1.868732	522260.4	37322	471372.4	128.5105	
Greece	5.0461	201671.3923	13290.21	29189.32	22417.99	0.5290	7.23925	41068	63560	51481.62	167.9757	
Iceland	16.3379	1777694.871	34108.04	4708.654	13715.46	0.7550	-3.6507	4010.961	161.3	4618.789	160.7954	
Ireland	9.7116	4552187.814	29436.71	163530	120728.1	1.5119	5.224201	30970.25	63290	54523.7	162.9453	
Italy	1.1409	844865.5589	23418.43	224079.3	378931.4	0.5196	3.434163	361660	22563	367800.8	128.8581	
Japan	0.4644	844137.5893	28606.78	100898.5	449567	0.2728	-7.64289	822022	63560	1072790	124.858	
Korea, Republic of	0.3326	3270.910936	12504.16	104880	49190	0.7583	9.139826	117184	22856	250817	133.063	
Mexico	0.0166	366009.0552	3838.032	226136.3	36446.5	0.5597	8.422292	91454.02	40791.8	201404.1	189.7851	
Nether-lands	0.347	302012.5728	26215.47	451234.1	757870.7	1.5799	4.161264	625.1372	7958	930.8703	147.9743	
New Zealand	18.518	185449.1991	17114.3	52229.88	12824.8	0.7274	-6.88818	67522.62	2084.6	42901.79	156.9813	
Norway	10.1131	1130169.626	40738.43	76322	120458	0.7280	14.32011	63954.21	2289	56742.57	159.9287	
Portugal	4.3461	366009.0552	9892.764	63339.75	53983.73	0.6595	6.751654	39762.97	5122.6	41846.13	177.6087	
Spain	1.044	375604.7638	18721.62	384538.5	413605.5	0.5664	6.835952	203626.3	18973.2 3	333189.1	140.1394	
Sweden	1.8338	482985.9112	37363.43	171818.4	265544.2	0.8973	3.41065	96706.6	4263 5	63117.15	108.0459	

Switzer-land	0.2689	2277288.719	38075.02	170156.3	559949.6	0.9119	1.137943	43954.7	4201	81200.53	132.1094	
Turkey	0.7385	12450257	3718.161	71299	8866	0.4721	6.671187	56936.3	22046	96546.9	137.0331	
United Kingdom	0.0824	787417.8565	23639.57	840652	1454904	0.5627	5.985391	488434.2	30776	392572.1	156.9012	
United States	1.032	322771.0704	29303.71	1634121	2477268	0.2780	4.385468	1970730	141730	2435411	138.6378	
Australia	1	399205.4938	26768.72	260902.6	289516	1.0831	22.1072	59387.5	10218.35	72708.11	142.695	2006
Austria	0.654	1278682.021	28484.27	111072.3	156042.5	1.0831	15.95231	47522.89	3928.3	72708.11	137.3067	
Belgium	0.7328	273867.6152	26633.82	481355.9	748165	1.7145	16.27168	89428.36	4264	88216.53	142.4177	
Canada	0.4417	209510.0301	27746.67	376425	521652.7	0.6961	12.58521	245884.2	16484.3	292704.3	140.8319	
Denmark	0.0261	2270800.066	35763.23	107981.9	143263.5	1.0091	15.37972	71050.91	2786.6	61180.69	142.1666	
Finland	3.3684	2912283.379	38350.55	70568.68	115813.7	0.8543	12.28913	45876.46	2466	43420.18	103.8345	
France	8.1733	267464.6575	26464.73	762123.9	1291577	0.5478	14.94954	530779.4	24745.7	479660.8	134.3258	
Germany	8.5204	16646.48048	27118.62	591460.6	1294453	0.8503	14.4909	533694.9	38163	513598.1	130.3792	
Greece	0.1901	222402.3568	13818.64	41287.97	31650.13	0.5596	21.44409	42844.62	63820	57749.14	175.2149	
Iceland	0.0513	1863384.659	34342.65	7667.367	27590.29	0.8206	21.96196	4066.272	169.6	5859.191	157.1447	
Ireland	0.1137	4362579.561	30513.46	156491.3	145861.5	1.4908	19.10081	34235.23	63560	61437.83	168.1695	
Italy	0.8514	951772.9648	23720.39	294876.5	520083.9	0.5629	15.30961	375416.7	22988	402762	132.2923	
Japan	1.9463	945643.7719	29292.08	107633.5	542614	0.3098	-2.3397	779912.6	63820	1038003	117.2151	
Korea, Republic of	3.3813	3438.066738	13073.65	119140	74780	0.7798	3.753375	138146.2	23151	281933.9	142.2028	
Mexico	66.6592	393154.2476	3980.295	245452.6	44702.8	0.5765	6.15125	99276.63	42197.8	243011.4	198.2074	
Nether-lands	2.7011	336731.7568	26883.12	513301	876917.8	1.6445	15.96455	643.6572	8108	1023.801	152.1355	

New Zealand	0.055	195004.7965	17203.73	63054.57	15065.91	0.7053	27.16873	75316.93	2134.7	45093.35	150.0931	
Norway	0.1076	1232282.878	41254.67	95688	143051	0.7479	20.91478	74088.31	2362	66140.02	174.2488	
Portugal	0.2421	393154.2476	9962.873	88460.97	67707.74	0.7023	22.25063	40309.92	5159.5	43255.98	184.3604	
Spain	0.9368	392427.3531	19212.78	460583.5	590585.5	0.5919	18.31701	222716	19747.6	380744.5	146.9753	
Sweden	0.5663	530917.4091	38692.55	227329	327333.1	0.9484	14.2816	103338.6	4341	71659.82	111.4566	
Switzer-land	3.5978	2432184.782	39100.59	264943	657905.3	0.9714	7.89236	43982.71	4304	87280.07	133.2474	
Turkey	0.9766	13205402	3894.636	95078	12210	0.5025	21.57636	65473.09	22330	117093.1	143.7043	
United Kingdom	12.1849	947365.118	24186.68	1139155	1841018	0.6022	19.63478	525622.8	30500	427843.1	162.8866	
United States	0.9305	370685.8736	29848.15	1840463	2916930	0.2912	3.803804	2098112	144427	2591081	143.0232	
Australia	1	458390.1045	27516.39	341656.5	289516	1.1331	-164.802	67559.08	10512.35	84523.72	164.8022	2007
Austria	0.9695	1429709.702	29323.69	163403	156042.5	1.1331	-153.259	53835.96	4027.9	84523.72	153.259	
Belgium	0.968	310062.9612	27202.06	592973.4	748165	1.7463	-158.689	101705.7	4380.275	103464.4	158.6894	
Canada	0.9358	245893.4834	28208.79	497203.7	521652.7	0.6736	-153.417	276019.2	16866.4	332578.2	153.4171	
Denmark	0.9336	2599120.768	36322.25	120460.7	143263.5	1.0246	-157.546	80609.68	2778.6	70936.48	157.5463	
Finland	0.9593	3316145.147	39884.11	92147.82	115813.7	0.8638	-116.124	52608.85	2512	54789.14	116.1236	
France	0.9549	312302.6124	26814.9	950335.6	1291577	0.5489	-149.275	599385.7	25093.1	575880.9	149.2753	
Germany	0.9504	20317.07127	27809.38	675532.2	1294453	0.8681	-144.87	596246.4	38734	605731.3	144.8701	
Greece	0.9684	260872.1835	14339.78	53220.81	31650.13	0.5652	-196.659	52100.12	64120	70593.15	196.659	
Iceland	1.0433	2114482.216	33833.42	12765.82	27590.29	0.7996	-179.107	4946.202	177.2	5793.88	179.1066	
Ireland	1.0028	4380378.267	31399.4	193450	145861.5	1.4817	-187.27	41368.26	63820	68494.02	187.2703	
Italy	0.9572	1049239.043	23934.92	364839.2	520083.9	0.5826	-147.602	416577.3	23222	460618.3	147.6019	

Japan	0.8539	1019354.376	29926.37	132850.9	542614	0.3355	-114.875	784835.9	64120	1055680	114.8754	
Korea, Republic of	0.8869	3647.765363	13667.69	119630	74780	0.8234	-145.956	154168.5	23433	308760.1	145.9562	
Mexico	0.9072	453318.1333	4067.063	272730.6	44702.8	0.5844	-204.359	104636.7	42906.7	262118.4	204.3586	
Nether-lands	0.9929	388475.0071	27693.55	724074.1	876917.8	1.8012	-168.1	762.9956	8310	857.5265	168.1001	
New Zealand	0.9207	223338.2491	17551.76	70941.73	15065.91	0.7673	-177.262	67498.64	2174.5	40279.93	177.2619	
Norway	0.952	1437915.519	42054.94	121616	143051	0.7559	-195.164	89599.09	2443	82667.44	195.1635	
Portugal	0.9484	453318.1333	10142.24	115314.4	67707.74	0.7292	-206.611	45234.74	5169.7	49542.63	206.611	
Spain	0.9792	431036.3377	19733.92	605138.2	590585.5	0.5976	-165.292	262818.4	20356	448052.6	165.2923	
Sweden	0.9554	657277.165	39490.33	289988.8	327333.1	0.9750	-125.738	117294	4541	89308.56	125.7382	
Switzer-land	0.9663	2802331.731	40134.46	337533.4	657905.3	1.0256	-141.14	46378.97	4413	95826.29	141.1397	
Turkey	0.8314	13834863	4040.673	157649	12210	0.4894	-165.281	80177.55	20738	145713.8	165.2807	
United Kingdom	0.8076	1016897.317	24808.6	1263652	1841018	0.5622	-182.521	592352.5	30200	511385.5	182.5214	
United States	0.8894	413500.0101	30206.29	2109876	2916930	0.3011	-146.827	2228921	146047	2531980	146.827	