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2007-09-01

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Original Publication Citation

Phillip J. Bryson and Keren Sun, "Provincial Development in China: Lessons from EU Regional Policy Experience," *Global Economic Review*, Vol. 36, No. 3, September 27, pp. 193-215.
<http://www.tandfonline.com/doi/abs/1.18/12265871561935>

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Bryson, Phillip J. and Sun, Keren, "Provincial Development in China: Lessons from EU Regional Policy Experience" (2007). *Faculty Publications*. 239.
<https://scholarsarchive.byu.edu/facpub/239>

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**Provincial Development in China:
Lessons from EU Regional Policy Experience**

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Abstract

Regional development in the Chinese provinces and in the regions of the EU countries are evaluated and compared. Development efforts in southern Italy, northeast England and eastern Germany are reviewed along with EU, Community-wide regional development programmes. Equity concerns suggest promotion of regional policy, but the pursuit of maximum national economic growth would avoid it, since it sacrifices some economic growth. The impact of FDI and domestic investments on individual Chinese provinces is compared with their impact in Europe. There is an implicit contrast between public sector regional development programs and more effective private foreign direct investments.

Keywords: Regional economic development, European Union, FDI, Economic Growth, regional development programs, lagging regions.

Provincial Development in China: Lessons from EU Regional Policy Experience

Regional economic development can be financed by investment funds generated locally at the sub-national level, by funds from other regions of the nation, by public funds from outside a country, such as those provided by the European Union to regions of individual member countries, or from foreign direct investment (FDI). The Chinese government can fund regional investments from its own budget, transfer investment funds from other regions, and create an environment that encourages foreign direct investment from abroad. Chinese economic development has been exceptionally dynamic over the past three decades, but has tended at best to be a reflection of the conditions prevailing in the most advanced regions. Those regions, an important part of the global economy, are becoming more closely linked to buyers and producers beyond national frontiers. Their prosperity cannot help but promote the wellbeing of neighbouring provinces and regions, but to this point, the positive influence has remained indirect and has failed to generate sufficient economic growth in the less-favoured regions.

Scholars have long considered the causes and effects of Chinese economic growth and have been concerned about the strategies and policies that will promote more rapid growth in the lagging regions. More balanced regional development has been a policy concern for a number of years in the European Union (EU). It is of interest for China to review EU experience, which has been a product *inter alia* of an effort to promote more rapid development in lagging regions. This paper seeks to derive insights and lessons from EU experience that would benefit China as it seeks to achieve more balanced regional economic development.

Section I addresses the relationship between regional development and economic integration and discusses some of the programs designed to promote regional development in EU member states. China has not been engaged in a process of economic integration building on a customs union, as have the smaller European countries over the past several decades, but it is in a process of economic integration internally. This section reviews the various kinds of programs the European Union has adopted to promote the development of lagging regions within the community and which may or may not serve as a model for China.

Section II considers some of the EU countries that have received regional development funds along with the results of those programs. It reviews development experience in southern Italy, northeast England and eastern Germany, after which it looks at the evolving nature of regional development efforts across the community. Also, a comparative review of the institutions of research and development in the “new economy” is made for the EU and the United States.

Section III considers the promotion of regional policy supportive of the growth of the lagging regions on the basis of equity. But a concern for maximizing national economic growth might suggest that such policy be avoided or minimized, since the redistribution that would drive regional development implies at least some sacrifice of immediate growth. Section III evaluates some of the important factors in provincial development, *e.g.*, the role of international trade and the tendency of the market to produce

outcomes of greater equality for regions of disparate income levels. Some of the forces that work against market equalization are also considered, as are the reasons why China might perceive the need for active policies to achieve more rapid development for lagging provinces.

Section IV turns to the question of the actual regional development record in China. The Chinese economic system and the economic situation play a role in the divergent development paths of the regions. These factors and the role of domestic and foreign direct investment in the development of the provinces are evaluated.

I. Regional Development in Integrating Europe

Regional Development and Economic Integration as Complementary Policies.

The European Commission has emphasized the importance of balanced regional development as the economic complement of the liberalization of trade policy (European Commission, 2005). Regional integration is seen by the EU, at least formally, as simply being a part of a wider strategy of geographically equitable growth. Regional integration alone is not considered an appropriate objective. If done effectively, regional integration should increase competition, promote foreign direct investment, help diminish private transaction costs, and permit firms to benefit from scale economies. Regional groupings should avoid the temptation to pursue the protective tariffs of autarkic development, since regional economic integration and multilateralism are best thought of as mutually reinforcing processes.

The EU is of interest to China, which is currently contemplating how more expeditiously to promote the development of its provinces. The EU has pursued that objective with considerable resources because regions within and across European countries are of widely diverse levels of economic development. The differences are considered too great to accommodate a spirit of economic cooperation in the community's overall development process. With the expansion of the EU to the peripheries of the continent, inclusive of transition and less highly-developed economies, this has become an increasingly great challenge.

But fundamental to economic integration and the development of regions is the reciprocal opening to trade of the markets of all member countries. Trade gains are the substance from which regional trading agreements can provide resources for regional development. Naturally, those agreements, like the EU itself, are generally inferior to universally open markets (Frankel, 1996). There are some minor exceptions to this general thesis, such as in cases of high transportation costs. The desirability of regional trade agreements would depend on whether the achieved level of integration had exceeded optimality, so that transportation costs between regions were too great to justify global specialization and trade. Since the latest round of the energy crisis, economists have not yet adopted the view that the period of low transportation costs is permanently behind us. So the assumption remains that worldwide free trade would have to be the wave of the future for the wellbeing of the global economy.

European Regional Development Programs: Structural Funds

Given the priorities and aspirations of the European Union for regional development, it is appropriate to consider the policies in place and the resources already committed to achieve the objective. The European

Commission has admitted that “major socio-economic disparities persist” among the regions of the community (European Commission, 2004). Regional development programs are intended to reduce those and promote “economic and social cohesion.” Two of the most important of the Commission’s programmes are the Structural Funds and the Cohesion Fund, which are to promote the development of regions whose average per capita GDP is less than 75% of the EU average.

The Structural funds include the European Regional Development Fund (ERDF), discussed separately below; the European Social Fund (ESF), which provides assistance under the European employment strategy; the European Agricultural Guidance and Guarantee Fund (EAGGF), which promotes the development and structural adjustment of lagging rural areas. Finally, the Financial Instrument for Fisheries Guidance (FIFG) supports the restructuring of regional fisheries. The use of these funds is to restore declining rural and fishery areas to viability and to aid economically challenged urban areas. The effort is addressed to areas containing 18 per cent of the expanded Union’s population. A number of regions originally receiving assistance between 1994 and 1999 are no longer eligible and decreasing aid will be granted to them. These include East Berlin (Germany), Hainault (Belgium), Cantabria (Spain), Corsica and the districts of Valenciennes, Douai and Avesnes (France), Molise (Italy), Southern and Eastern Ireland, Flevoland (Netherlands), Lisbon and Tagus Valley (Portugal), Northern Ireland and the Highlands and Islands of the UK. Structural programs have been available, of course, to lagging regions in the wealthiest countries of the Union as well as to the lagging regions in countries of lower incomes.

The program offers four initiatives designed to stimulate competition between and among nations and regions, to promote rural development, to provide for new ways to combat discrimination and inequality in accessing labour markets and to encourage both the social and the economic regeneration of towns, cities and suburbs in decline. The total budget for Structural Funds programs for the period 2000-2006 was 195 billion Euros, with 158.4 billion of that being targeted at lagging regions and those with structural difficulties. It is important to note the EU’s principle of “additionality,” which is that Community assistance must be additional to national funding; it cannot simply replace it.

The (ERDF) and Other Initiatives

The objective of the European Regional Development Fund (ERDF) was to promote economic and social cohesion by correcting the main regional imbalances for the period 2000-2006. The next round of Structural Funds Programmes for the period 2007-2013 will be significantly less well funded. The attempt is to regenerate economic and industrial areas in decline, including depressed urban and rural areas and those dependent on fisheries. Investment projects finance the development of trans-European telecommunications, transport, and energy networks; they also support the activities of small and medium-sized enterprises, especially their investments, the transfer of technologies, and the provision of local infrastructure. In some of the lagging regions, investments in education and health are intended to promote economic and social cohesion.

The ERDF is particularly concerned with “innovative measures” as a formal part of the strategy approved at the European Council in Lisbon in March of 2000, which committed the EU to increase employment, economic competitiveness and social cohesion, all in the framework of the information economy. From 2000-2006, innovative measures are to be adapted to promote regional economies based on knowledge and technological innovation, develop the information society to achieve regional development, and achieve regional cohesion by integrating economic, environmental and social activity.

The European Commission (2003) has announced the funding of a series of investment projects with objectives similar to those of the ERDF. The report discusses measures to attract public and private sector funds to invest in networks and knowledge. Member States are to maintain sound macroeconomic policies and pursue accelerated structural reform. Trans-European networks in transport, energy and telecommunications are to be developed. The total volume of investments was expected to reach 62 billion Euros by 2010. Priority projects were based on their trans-national scope, their impact on growth and innovation, and their prospective environmental effects.

The Commission (2005) presented a number of new legislative proposals for the period 2007-2013. The Union’s enlargement to 25 countries changed the social and economic situation prevailing in the community rather dramatically. Whereas the Union increased in area by 23% and in population by 20%, its wealth increased by only 5%. The average *per capita* GDP declined by 13%, and regional disparities doubled. In July, 2004, the Commission adopted seven regional policy legislative proposals. The new regional policies budget (EUR 336.1 billion) is responsible for the community’s largest single expenditures category and accounts for a third of the budget. As a result, Union action will continue to focus on regional development problems, which relate closely, of course, to European employment strategy.

Union Regional Policy in the Context of European Expansion

With the accession of ten new countries to the Union in May of 1984 (mostly in the central and east European areas), together with the accession of Romania and Bulgaria at the beginning of 2007, Europe’s single market expanded from 370 million to about 485 million consumers. These new states, mostly still in the transition from central planning to democratic market orientation, are at a significantly lower level of GDP than the earlier member states.

Of the 135 million people living in the newly acceded countries, over 127 million are from regions of per capita GDP less than 75% of the enlarged community’s average. The needs of their regions are extremely great in terms of developing industry, agriculture, transport, services, and investing in environmental preservation and amelioration. They are also in need of considerable human capital investments. Managing a regional development policy is beyond the experience of the new member countries. Recognizing this challenge, the European Commission (2004) announced a strategy. In the Commission’s view, the principles of solidarity require that European structural policies concentrate on less-developed regions, recognizing that these included basically all the regions of the new member countries. Moreover, continuing disparities in the original 15 would also require their inclusion.

The new members would have to manage the Structural Funds to which they have since become entitled. Integrated, multiple-year regional development programs would have to be designed and the responsibilities of all those involved in their implementation would have to be designated. Regular reports were made by membership candidates on their progress towards compliance with the principles and standards of the *acquis communautaire*. The Commission developed accession partnerships with them and opened programs to them well before their actual accession.

After the 2004 accession of the ten new member states had been successfully concluded, the European Council granted them EUR 21.7 billion of additional resources for 2004-2006. Following the Commission's guidelines, the new members finalized their regional programs for those years and began receiving Structural Funds in January, 2004. They are also participating in other Community initiatives for rural development and disadvantaged areas.

As the future of regional policy in the enlarged European Union is currently under discussion, the Commission has drawn up proposals for a "cohesion" policy after 2006. A new "Objective 1" will address needed structural measures for lagging regions not yet having "achieved economic convergence" with their more advanced counterparts, and nearly all the regions of the newly acceded member countries. Objective 1 will concentrate three quarters of allocated funds on Regional Policy.

A newly redefined "Objective 2," accounting for 20% of the Commission's funds, will support projects promoting regional competitiveness, employment and training for regions not qualifying for Objective 1 projects. Each Member State will have to concentrate their efforts on specific areas, budgets and time horizons. The remaining five per cent of the Commission's considerable funds will apply to interregional cooperation both within and beyond the borders of the EU.

II. EU Lagging Regions and Past Development Efforts

The EU's considerable fiscal effort to develop its lagging regions has extended over decades. Where community-wide labour mobility is not currently high and is not likely to become much greater, one cannot rely on individual action to bring labour markets closer to equilibrium and incomes into much greater equality. Thus, the European Community pursues greater income equality through regional development programs. It is not clear, however, how effective such programs have been or may yet prove to be. We turn now to consider briefly some of the European efforts to jump-start or enhance the economic development of lagging regions.

Southern Italy.

Italy's 145 years of political unity have brought about a higher degree of homogeneity of the country's northern, central and southern regions. But even after that extended period, the Bull (1996) reported the very idea of State-funded regional development was in question." In the late 1940s, Italy's regions were granted limited legislative powers in fields such as police, town planning, public works, health services, local transport and communications, tourism, agriculture and forestry; but 'primary' legislative responsibilities were withheld from them until a series of laws in the 1970s set up today's regional system.

Although a high degree of cultural and lingual homogeneity has been reached across the regions, years of regional policy and regional development efforts have been addressed to the continuing, basic North/South divide.

Since the beginning of the 20th century, such efforts have been essentially without effect, partly due to the lack of indigenous entrepreneurial culture in the south, but especially to a lack of resources and the presence of corruption (Clark, 1983). The distribution in the south of subsidies and patronage by central, state development agencies is largely the history of the century. The attempts of such agencies appear more to have been targeted to win political support than to achieve lasting economic progress.

The attempt to promote industrial development was, doubtless, inevitable. An important regional objective was the promotion of small and medium-sized firms and the entrepreneurship that would sustain development. Two huge, state holding companies became the vehicle to make investments in the South; they established numerous, capital-intensive industrial plants in a nascent heavy industry sector. Unfortunately, the energy crisis in the early 1970s and steel over-production throughout Europe provided these firms with few hopes from the outset. Regional governments basically proved incapable of designing or implementing effective development projects and corruption was also a problem.

After more than forty years of active regional policy and regional development, the south has been modernized, but has not achieved economic development. Regionalism seems to have gained and retained public acceptance in part because of a rejection of central bureaucracy, inefficiency and incompetence, with little regard in general for the European movement. But a consensus seems to be developing that indiscriminate subsidies and politically-directed transfers from the northern to the southern regions should end.

Regional Development in the North East of England

The North East (NE) has shown rather poor long-term economic performance in the United Kingdom (Johnson, 2005). Other regions across the UK have also demonstrated lower income growth and lower than acceptable employment levels. In 1997 the UK was among the top ten nations in terms of economic competitiveness, but the country declined substantially thereafter. The decline in competitiveness is seen as a result of the widening disparity between the nation's leading and lagging regions. London remains the country's top performer among regions, but it is also not as strong as it was in 1997.

The decline came in spite of years of EU regional development support and substantial restructuring among the UK's diverse regions. Through that period, the Northeast region has remained weak (Hudson, 1998). Development prospects in general now appear discouraging as a number of regions have failed to achieve non-ambiguous economic development (Cambridge Econometrics, 2000, p. 182). The British government (Office of the Deputy Prime Minister, 2005) has recognized that EU structural funds, henceforth to be disbursed among 25 rather than 15 member states, can now be expected to diminish dramatically. It has proposed a framework to continue support of lagging regions even as EU financial support diminishes. Such support would be for devolved policies and programs to be determined by the regions themselves. The UK government contends that reform is essential and is now prepared to step up

its commitment to lagging regions. The government persists in the view that there can be no secure, long-term prosperity for the country as a whole unless all regions are enabled to achieve adequate developmental performance.

Regional Development in Eastern Germany

By 2000 the claim had been made that real incomes in East German regions had reached the level of West Germany (Sinn, 2000). *Per capita* investment in the preceding period had been much higher than in the west. Unfortunately, a full third of the funds involved had come from the west and investment in equipment had fallen below the *per capita* West German level. The attempt to close the gap in incomes, investments and productivity had bogged down completely. Overall labour productivity had failed to exceed 55% of that of West Germany, largely due to excessively high East German wages stemming from the reunification policy of 1990 and the lack of incentives this provided for investors.

From the European Regional Development Funds and other EU programs, East Germany was able to take advantage of Structural Funds from the first program period, 1991 to 1993. A total of ECU 3 billion were made available to East Germany, or approximately ECU 180 per capita (Toepel, 1999). The main fields of assistance were: investment in general economic infrastructure programs (25.2 % of funds); development of human resources (12.9 %); productive investment (25.3 %); investment in agriculture and food processing (13 %); long-term unemployment and occupational programs (7.7 %); and environmental protection and rural development programs (14.6%). It should be noticed that these early Structural Funds programs were broadly spread and in areas that would not directly promote general economic and labour productivity growth as later programs would attempt to do.

In the second programming period from 1994 to 1999, the East German states were classified as priority regions and were entitled to doubled funds: about 13 billion ECU were available to them during this period. One must keep in mind that in the early years of EU regional development programs, funds from these sources flowed into East Germany in substantially lesser amounts than the transfers being sent from West Germany. In fact, the total volume of EU aid for *all* East European recipients up to 1994, 14 billion ECU, was less than 20 per cent of the volume of financial transfers from west Germany to east Germany in one year. These continuing EU funds could be used for investments in infrastructure, for the support of small and medium enterprises, for the promotion of R&D, and so on.

EU financial support for regional programs for the years 2000-2006 amounted to EUR 195 billion. The funding came from structural funds for the entire European Union. Of that total, EUR 29.8 billion (15 per cent) were earmarked for Germany (Reissert, 2003). The European Regional Fund (ERDF) is the source of 50 per cent of this funding in Germany. The European Social Fund (ESF) provided a little less than 40 per cent. *Länder* governments receive EU funds not only for the standard purposes of investment assistance, but also for urban development, technology, environmental, and transport projects designed to promote regional economic development.

In spite of the generous flows of development assistance to East Germany, it can hardly be asserted that regional policy has been an unqualified success. Emigration from the East German *Länder*

continues, especially of the young workers who would normally be the core of the labour force. These regions of the country face an aging populace and a dangerous loss of the more highly-trained and creative workers. German unemployment, although high in the West, is substantially higher in the East. The economic growth of the new German states has lagged that of the West for a number of years. If the West German economy had not been relatively stagnant in recent years, the ever-widening development gap between East and West would be even larger. The financial costs of East Germany's reconstruction amount to about four percent of the country's annual GDP. Since that amount exceeds annual economic growth, however, the continual flow of aid to the East is seen as eroding the West's economic base.

Regional Development across the EU

Across the EU there are many significant economic problems to confront, not least of which is employment. Consider the difference between the EU and the US; in services alone this amounts to 14%, which translates to 36 million jobs. In the most dynamic markets characterized by technological change and new information technologies, the EU's competitiveness is most tenuous. There is little evidence of a 'new economy' in terms of a rapid expansion of productivity growth such as the United States experienced beginning in the second half of the 1990s. EU expenditures for public and private research amounts to only 1.8% of GDP, while that of the United States is 2.7% on average and that of Japan is 3.1%. Over the last quarter century, the larger EU economy has spent only about half as much on industrial R&D as the United States, which amounts to a difference in excess of \$60 billion annually. Researchers account for only 2.5 per thousand of the industrial labour force in Europe, whereas they account for 6.7 per thousand in the US and 6 per thousand in Japan (Mitsos, 2001).

Across the larger, trans-national regions of Europe, there are some interesting and important differences in the structure of expenditures for technological development. In the northern regions, research and technology development (RTD) are generally the concern of private business and, consequently, a function of private sector, commercial demand. In the southern regions, especially in cases where the capital city is located there, public sector involvement is much greater. Business RTD expenditures in Greece and Portugal are only about ten percent of the EU average. In those instances, there is generally less knowledge transfer between the public and the private sectors, as well as between companies within the private sector. Linkages to international RTD networks are also weak.

Per capita GDP from Greece through southern Italy to southern and western Spain and Portugal is generally only from half to two-thirds of the EU average. In East Germany it is around 60% of the EU average. In the EU's outermost regions *per capita* GDP is no more than about half, or even less than half of the average. There are also clusters of poorer regions in the Northern periphery, particularly in Finland and the UK.

Initially, the EU's Structural Funds were committed primarily to physical infrastructure. Today, attention has shifted to the demands of the knowledge economy and there is cognizance of a greater importance for investments in education, training, research and innovation. Structural policies have been rethought and the EU is more interested in actions to enhance innovative capacity building than in simply

producing infrastructural improvement. Less than EUR 200 million were devoted to RTD expenditures from EU structural funds before 1988. In the last ten years expenditures of EUR 12 billion have been made in these areas.

Because Europe has been weak in its efforts to transform research results into innovative processes and products, the EU has adopted policies to promote innovation in the lagging regions. The effort is being made to compare regional experience and exchange “best practice” through benchmarking. Trans-regional co-operation is encouraged on innovation issues and support is provided for the creation of “technology enterprises” and the development of regional technology strategies (Mitsos, 2001). The evolution of this strategy has been evident in EU Commission programs described in the previous section. For some time the recognition has been ripening that, for example, regions like East Germany cannot compete globally with low-wage countries in manufacturing. Rather, it must attempt to develop capacities that will enable it to participate in the information and telecommunications industries, or in the biological/genetic/medical industries of the “New Economy.”

If one considers the efforts of the EU over the past two decades or so, comparing them with a model of RTD development in the United States over the same period, one can derive insights that should be of assistance to China in the course of its future development. The United States has developed its own model of generating and applying technological developments through phases of pure and applied research in the areas of defence-related technologies, then applying spin-offs from this process for technological-commercial development.

Pure and applied research must develop as a part of the higher education establishment. In the U.S. model, defence interests have supported the funding of pure and applied research in universities and other public and private institutions (*e.g.*, Los Alamos, NASA, RAND, and many other “think tank” centres and institutes, etc.). This brings about a transformation of knowledge structures to development and production for military and civilian applications. For economic development, the interface between research and development must be strong from both sides. Both military and commercial applications draw heavily on pure as well as applied research. Commercial development is the product of new applications drawn from innovative research and technology activities. It applies these activities to private market development efforts.

In regions where these activities tend to break down or are not even initiated from either or both sides in the first place, *i.e.*, from the research side at one end of the process or from the commercial side at the other end, regional development will fail. As we have seen, development can succeed in a given region, but fail in other regions. In the above-mentioned peripheral regions, especially in the south, the research effort needs to be strengthened. But where that is the case, the commercial application effort is also inadequate because of the lack of strong commercial activities in those regions. The EU regional effort first focused especially on infrastructure activities, in the regions showing the least development. To focus on infrastructure, environmental conditions, etc., does not necessarily improve the commercial strength of the region as a focus on research and technology development could.

More recently, the EU has begun to focus on the development of the ICT sectors of the developmentally lagged regions. It proposes the strengthening of research efforts in those regions as well. But this alone will not establish the productive interface between the weak business superstructure of the lagging regions and the RTD substructure on which effective commercial development of the “New Economy” depends.

The Role of FDI in Europe’s Regional Development

Before concluding this section, it is appropriate to consider the role of foreign direct investment in the regional development of the EU. Our research has demonstrated the very significant role these private sector, cross-border investments have in promoting economic development. We do not yet have data on the receipt of FDI by the individual economic regions of Europe, since Eurostat has not yet provided it. We have provincial data on FDI for China, and it will suffice for our purposes to compare the individual European countries (although it is not possible to make effective comparisons of some of the larger EU countries) to the Chinese provinces.

Table 1 displays regressions of the GDP of European countries on their domestic and foreign direct investment. Those variables explain a large share of the GDP growth of most European countries and we conclude that domestic investment and foreign direct investment have a strong, statistically significant relationship to the GDP of most of the Union’s countries. Regional programs may also have an indirect relationship to what growth the lagged regions have experienced, since they have provided important infrastructure improvements that *indirectly* aid economic growth, largely by making regions more attractive for foreign direct investment.

Some of the EU countries displayed in Table 1 have lower R square values, showing that domestic investment and FDI in those countries do not alone explain as much of the variance in GDP. We would expect in countries more developed than China that consumption (both government and personal consumption, representing both the public and private sectors) plays a greater role in determining GDP and its growth. Presumably for this reason, the larger EU countries of Denmark, Germany, Portugal and the Netherlands would be expected to have lower R square values, showing less of an impact of the investment variables on economic growth. It is not immediately clear why the same situation does not hold for France, Italy and the UK, where the relationship between FDI and GDP would not be expected to be as significant as for the smaller countries, but it is.

Low t-test values indicate for Poland, Slovakia and Latvia that FDI has no impact on GDP in those particular countries. There was also insufficient data on FDI to determine a relationship for Greece, Luxembourg, Romania and Slovenia. A low R square for Malta is accompanied by a low t-test for the log of FDI, which again indicates a lack of impact of that variable on Malta’s GDP.

III. Why Pursue Regional Development Programs in Integrating Economies?

The European Union has long pursued efforts to promote the economic development of poorly performing regions as an inherent objective of the process of economic integration in the European Coal

and Steel Community (ECSC), the European Economic Community (EEC) and the European Union (EU) as the development process has proceeded. This has been part of a more general strategy to promote equitable growth. Official Europe (European Commission, 2005) denies that this is an end in itself. If regional development is effective, it increases competition, reduces private transaction costs, encourages foreign direct investment, enables the region's firms to exploit economies of scale, and facilitates macroeconomic policy coordination.

Foreign Trade Areas and Customs Unions, according to the EU, should remain open towards the world market and keep trade barriers below levels that encourage trade diversion. Regional autarky has often enough led to failures and should be avoided. The objective, then, is for regional integration to bring community members the benefits of regionally open markets at the same time as the global movement toward free trade opens global possibilities. Regional integration brings neighbouring countries these benefits while attempting to bring greater balance to overall development by promoting the process in lagging regions.

Overall growth vs. equity among regions

Especially in the earlier stages of economic development, the pursuit of inter-regional equalization can be made only at the cost of overall national growth (Bergs, 2001). There is a trade-off between growth and equity and if equity is the primary concern, nations or supranational organizations should promote regional policy. This would imply support of growth for lagging regions, for example, in the central and east European countries. If economic growth has the highest priority for them, however, they would support national growth policies. From this point of view, regional development policy represents, at best, "catch-up equalization." To pursue the greatest possible growth, the central organization or government would basically have to give up the hope for regional equalization.

By the same token, redistribution implies the sacrifice of some growth. The funds transferred will have lower productivity in the investment possibilities of the lagged regions than they would have had in those of the more advanced regions. Nevertheless, seen from the long-term the redistributive equalization of the short term should ultimately propel the lagged regions toward more effective development. From an equity standpoint, the lagging regions should receive investment support at least equivalent to that received by the more advanced regions earlier in their development. Moreover, such support should enable the lagging regions at some point to take their place with other fully productive regions to make similar growth contributions.

The equity/growth trade-off demands consideration. Private investors would look at the investment potential in more highly developed areas and perceive correctly that projects would yield higher returns in those regions. From the perspective of private investment, the availability of a given amount of investment resources represented by the distance of the horizontal axis in Figure 1, labelled capital, K , should be divided according to the varying marginal productivity of capital in regions I and II. Investments yielding maximal marginal productivity returns would be at K_{11} (the distance 0 to K_{11}) for region 1 with its lower productivity and at K_{12} (the distance K_{11} to K_{12}) for region 2 with its higher productivity. This

Insert Figure 1 here.

implies that only a small share of the total investment resources should be targeted at the low-productivity sector, and it accurately portrays the kind of calculation the private sector would be expected to make.

But comparing the productivity of divergently developed regions is comparing apples and oranges. In the $(MP_{\text{capital}})^{\text{II}}$ region, we do not find the investment history of the more developed region, where the marginal productivity of capital is enhanced by a different infrastructure, established economies of scale and scope, agglomeration economies, network effects, and so on. So if the responsible central government or organization does not invest in the development of those things, leaving the private sector simply to seek the highest possible returns where developmental conditions are more favourable at the moment, the lagged region's unfavourable conditions are perpetuated.

The market tendency would be toward equalization.

Neo-classical theory would suggest that the market will solve this problem over time, since the labour/capital ratio in the lagging region will be relatively high, making labour relatively inexpensive and the prospective returns to capital investments significantly higher. The lagging regions would grow faster than the more advanced ones without government intervention. Berg argues that significant market imperfections and inequality of opportunity provide important regional disadvantages to backward regions (Bergs, 2001). This is why, as we saw earlier, the EU has recognized the need to subsidize regional development.

But international transactions costs constrain the process.

Rodrik (2000) has indicated that the existence and persistence of international transactions costs hamper trans-national integration. As a result, international economic integration remains of much less significant scope than it otherwise could be and progress toward it remains slow. Summers (1999) also addresses hindrances to trade that constrain economic development. The political and legal discontinuities associated with national borders, "even in the absence of serious formal tariff or non-tariff barriers, linguistic or cultural differences, exchange rate uncertainty, and other economic obstacles" restrict and depress global commerce (Rodrik, 2000).

International trade promotes development

As freely functioning markets benefit economies, international trade does likewise, simply being an expression of markets functioning beyond national barriers. If a lagging region is to be developed, it must not only receive vital investments. It must also become a part of market trade with other regions in an integrating part of the world.

Domestic trade in Canada contrasted with that between Canada and the U.S. is an excellent example of this fact. Helliwell (1998) shows that intra-provincial Canadian trade is far more integrated than trade with comparably-sized and even comparably-distant regions separated by a national border. Adjusting for scale and distance, Canadian inter-provincial trade in 1988 was 17 times as great as that between Canadian provinces and American states; it was still about 12 times as great after the

implementation of NAFTA agreements. Helliwell concludes that economic activity is a function of social networks related closely to ties of nationality and language.

Sachs and Warner (1995) provide compelling evidence of trade's long-term benefits. They show that between 1970 and 1989 the nearly 120 countries they investigated that could be characterized as open, developing economies grew almost three percentage points more rapidly than closed developing economies. They present evidence of convergence of the open economies of poor countries with richer open economies. For the closed economies, there was no evidence of convergence with the more developed economies. Even in light of other very important growth-producing factors, *e.g.*, the level of investment and educational attainment, openness remained an important explanatory variable for development.

Rodrik contradicts the conventional wisdom on globalization when he contends that we are still a long way from a world whose goods, services, and factor markets are perfectly integrated. The implications of a whole range of studies are that international economic integration remains surprisingly limited. International price arbitrage in tradable commodities tends to occur very slowly. The investment portfolios of the advanced industrial countries are typically under-diversified, since investors target a much higher proportion of assets at their own countries than at others where returns are equally high. Investment rates in a given country remain closely correlated with national savings rates, since capital flows between rich and poor nations are significantly less than what theoretical models would predict. Rodrik's transaction costs arise from various sources, but the most important one is probably the enforcement of contracts across national boundaries. If a party to international transactions reneges on a contract, local courts may not be willing to enforce such a contract.

The process of global market integration, according to Rodrik, requires a reduction in the transactions costs arising from national sovereignties. When a country wishes to develop a lagging region within its own borders, it faces none of these transactions costs, but may simply lack the resources for the project. Those resources are more likely to be available to supranational jurisdictions, especially in the case of the EU. Perhaps that resource scarcity is an important part of the explanation for the persistence of lagging regions. The answer for some countries with lagging regions would be to join the EU and lay claim to whatever regional development subsidies for which it qualifies. That is the picture for the newly acceded countries in central and Eastern Europe. But we must also inquire why lagging regions seem to persist even in relatively affluent countries like Italy. Perhaps it is because the rich sector acts as a magnet for the capital of private investors looking, quite appropriately, for the most favourable returns.

Why China needs to pursue regional economic development

There are still those who argue against and oppose globalization, of course. Wan, Lu and Chen (2005) point out that the nature of the relationship between globalization and inequality is under heated debate. Those who gain and those who lose from the process have different perspectives. As markets change and improve, as superior production processes and factors become available they displace the older, higher-cost, less efficient production processes and factors. Then, the struggle for survival usually shifts

from the market to the political arena. If the political process slows or stops the process, everyone eventually loses.

Trade will usually increase income differentials as returns to education and development-promoting human capital and technical skills drive the process. But the expansion of global trade marginalizes certain groups and even certain geographic regions if adjustments are not made successfully. Lags may also be experienced in terms of the development of accommodating institutions and even of governance as the development process unfolds (Stiglitz, 1998).

Evidence from China, as well as from some other countries, provides some support for this kind of argument. They have experienced increasing inequality after their economies have become more open. Wan, Lu and Chen consider studies that indicate a decline in equality due to trade expansion in some of the open economies. Since 1990 regional incomes have been diverging in China (Jian *et al*, 1996). Not surprisingly, the divergence can be explained by the variance between coastal and interior provinces. The inference is that China has become a dual economy including a prosperous and dynamic coastal region and a poor interior growing at a lower rate. Ravallion and Jalan (1999) show that the incidence of poverty is substantially greater in the rural areas of China than in the country's urban areas. In fact, this cleft in China is greater than any other country for which data is available. Averaging over all the households of a county, those counties that begin with greater wealth also usually enjoy higher average rates of growth. These authors observe that persistent pockets of poverty in China tend to perpetuate themselves. Moreover, geographic externalities are a common experience; lower returns to investment can be expected for those investing in a poor area. Again, we observe why the Chinese government has reached the view that public action is required to assure that poor areas don't remain stagnant due to underinvestment.

The empirical studies show that convergence for lagging industries is most dramatic when economic regions are linked by open trade and factor mobility. With the adoption of Chinese reforms beginning in 1978, labour mobility has become somewhat greater, although it remains constrained today. Although illegal migrants lack access to schools for their children, health care and other urban services, migration has increased in the last couple decades to 100-150 million people, many being single individuals without families (Jian *et al*, 1996). Some leave their families in rural areas, working and returning home on a seasonal basis. China seems to be moving toward a system that permits greater mobility as a means of enhancing the process of regional development and the economic well-being of the people.

IV. China and Regional Development

There is clearly a need for regional development in China as the overall economy is subjected to processes that will integrate the country. The case for openness in the Chinese economy need not be established, since it was accepted long ago by Deng and since then by his intellectual descendants. But two considerations need to be remembered in Chinese development as the process proceeds. First, the regions that have never received the status of the Special Economic Zones still need to become a part of the openness of the Chinese economy to the world. There is a developmental trade-off between openness to

international trade and a system of nationally funded regional development programs. Huge investments designed to bring lagging regions up to par may fail to achieve that goal. As we have seen in the EU's regional development programs, the actual achievement of regional equalization is very difficult, even given large expenditures over numerous years. If that process is successful, at the end of the developmental effort the elevated region will have become competitive and will be empowered to engage in globalization pursuits. It will also likely have begun to be integrated into global markets. China has demonstrated that economic development can occur on the basis of open markets and integration into the global community. Opening a region (or zone) to global markets is a lot less expensive than transferring large sums to build a region through EU-type regional development programs.

The second consideration that needs to be remembered in Chinese regional development is that the lagging regions are generally still under the shadow of central planning. Remnants of the command economy continue to stand between the Chinese and the economic modernization of the lagging regions. For some time, China has been preparing to complete the privatization of state-owned enterprises. Where there is no prospective economic viability for such enterprises, they should be closed and the possibilities for absorbing the resulting unemployment should be pursued. This process needs, of course, to be brought to conclusion. It will ultimately promote greater equality of China's people and openness for the lagging regions will likewise move the country in that direction. To go back would only be to restore an equality of want.

China has shifted its development strategy away from that old regime of self-reliance and import substitution industrialization and is intensely interested in pursuing fuller utilization of its comparative advantages in global trade. It has therefore been engaged in restructuring and reforming its economic system, which has involved a process of expanding its private sector and opening it to the global economy. Development has reflected the assistance of widespread foreign direct investment.

Globalization processes can stimulate unequal regional development

Wan, Lu and Chen (2005) intuit that globalization might play an important role in increasing regional inequalities through a number of mechanisms.

- Some regions have location advantages through which they are in a position to exploit the benefits of trade more completely. These would be regions that are in closer proximity to ports, or that are closer to Hong Kong, Macau, Russia, or Vietnam.
- Some regions, possessing closer family ties to overseas investors might be in a position to attract more FDI with their associated spill-over effects.
- Some regions can attract more tourists and can expand tourism more readily as China opens up.
- Some regions are in a better position to attract FDI or tourism as a result of the industrial planning which was of such dominant influence under the old system.
- Finally, local culture, customs and traditions differ from region to region. These differences are embedded in the leadership styles of the regional and local governments, making regional economies more or less receptive to foreign capital and technologies. In fact, such differences also

lead to different rates of economic reform in different areas of China, despite the uniform national policy of opening and the appeals of the central government for local governments actively to embrace globalization.

Obviously, these problems occur quite naturally as China continues to open up its economy. One should welcome them, since their absence would mean that none of China's regions would be doing well. Wan, Lu and Chen (2005) discuss not only the problems of the open economy, but also the associated benefits. They indicate not only that FDI positively affects China's economic growth, but also that the growth effects are more considerable in provinces that have a larger private sector in terms of the numbers employed in that sector.

Shifting the development strategy from import substitution industrialization to fuller utilization of comparative advantages requires economic restructuring and reforms. The result has been that the private sector, which has received mostly foreign funding, has gained an increasingly larger share of the nation's production and employment. This has meant a welcome decline in the share of national activity transacted through the state-owned sector. It has been accompanied by an unwelcome, increasing inequality of wellbeing of the people employed in the public and private sectors.

The Role of Foreign Direct Investment in Chinese Provincial Development

It is appropriate to consider the significant role of the interaction of the Chinese private sector with private sector foreign direct investments. Quantitative analysis reveals that both domestic and foreign direct investments both have a statistically significant impact on GDP growth in the Chinese provinces. Table 2 shows the results of regressing domestic and foreign direct investment on GDP in those Chinese provinces where they have had a strong impact on output and growth.

China has three regions – eastern, central and western. The eastern region is the most highly developed, the western one is least, while the central one is somewhere between the other two. This does not mean, of course, that all of the eastern provinces are highly developed or that all of the western ones are equally backward. The eastern region includes 12 provinces, including three city-districts and one autonomy-district. These include Beijing, Tianjin, and Shanghai city districts; the Hebei, Liaoning, Jiangsu, Zhejiang, Fujian, Shandong, Hainan and Guangdong provinces; and, finally, the Guangxi autonomy district.

The central region includes nine provinces, including the Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, and Hunan provinces – plus the Neimenggu autonomy district. The Western region includes ten provinces, city- or autonomy-districts. Chongqing is the city-district; the provinces are Sichuan, Guizhou, Yunnan, Shanxi, Gansu and Qinghai province, the autonomy districts are Xizang, Ningxia, and Xinjiang.

Table 2 about here

In seven provinces or cities in the eastern region, Tianjin city and Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan provinces, FDI has had a significant impact on economic growth. Some of the effects of foreign direct investment are also apparent in the Liaoning province and the Guangxi

autonomy district. Our quantitative results, however, do not show that FDI had any significant affect on economic growth in Shanghai city, Beijing city, or Hebei province.

In the central region, FDI has had a strong impact on economic growth in Neimenggu autonomy district and Hubei province. It has also shown some effects on growth in the Henan and Jilin provinces. In the western region, our results show a strong impact of FDI on growth in only two provinces, the Sichuan and Shanxi provinces. It did show some effects on growth in the Gansu province.

Similar quantitative analyses of the relationships between domestic and foreign direct investments and the GDP of Chinese provinces are displayed in Table 3. These results are for provinces in which foreign direct investment has had no statistically significant impact on GDP, as evidenced by the negative or very low t-test values for the logged FDI variable. The basic problem is that these less developed regions often receive little FDI, but the result can also reflect that what has been received has not contributed to GDP growth.

The manufacturing regions of China receive a much greater impact in terms of FDI. Since the early days of the Special Economic Zones, they have received larger amounts of it and it enhances their manufacturing capacity and output. Because China is not highly developed, trade and investment have a greater than proportional impact on growth than in the more developed countries, such as the European ones with which we compare the provinces. Because many of China's regions are still very much in the process of development, the growth rate of GDP is not as greatly affected by including consumption and government expenditures. The government's services are much more modest in China than in Europe. In the consumption especially of the rural regions, much less economic activity is market activity than would be the case in the more urbanized, economically developed regions. People raise more of their own food and supply their own services, which do not register as market (purchased) transactions. Where products and services are bartered to avoid taxes in the less developed regions, these are also not registered as market transactions that would enter into the GDP.

The cases of Beijing and Shanghai are of special interest, since both are large, Beijing is the capital and Shanghai is an international trade and finance center. For both cities, additional regressions of shorter time horizons reveal positive FDI effects on economic growth (high R squares and statistically significant t-test values) since 2000 in Beijing and since 1999 in Shanghai. Investments before this decade were mainly in the tertiary industry of the two cities. When the Asian crisis struck in 1997 and then began to affect China, FDI flows into China declined and those of the tertiary industry were most easily and rapidly reduced. Since 1998, FDI flowing into Beijing and Shanghai decreased nearly 20 percentage points per year, recovering gradually after 2001 in Beijing and after 2000 in Shanghai. But other regions of concentrated FDI such as Jiangsu, Zhejiang, Shandong, and Guangdong provinces, did not experience as dramatic a reduction in FDI or for quite as long a period.

Beijing and Shanghai cities retained GDP growth by increasing domestic investment and consumption. Since 1998, China has increased expenditures for higher education and Beijing and Shanghai

have the largest number of universities in China, Education reform since 1998 appears to have been very important in sustaining the country's economic growth.

Opportunities and challenges for further regional economic development

FDI in China has remained very strong in recent years and China is the number one target for global investment activity. It increased again in 2004, even though the Chinese government had announced its efforts to moderate the pace of economic growth (The US-China Business Council, 2005). Record-breaking FDI flows into China in 2004 exceeded \$153 billion in new contractual agreements, which represented an increase of about one third over the previous year. FDI actually utilized also reached a record high of nearly \$61 billion, surpassing that of 2003 by 13.3 percent. Although there were a reduced number of new projects, both actual and contracted foreign direct investments increased in 2005 with actual inflows reaching \$60.3 for that year.

A recent trend for investments to venture beyond the manufacturing sector into information technologies, high-tech, and service sectors is also continuing. Moreover, it is reportedly expected that investments will continue to push into interior locations. This is of particular importance, since these kinds of investments complement the strategic intent of China to begin now to prepare for a post-industrial future. As trade goes on and capital flows into China, trade forces will increase Chinese wages and incomes. Ultimately, one must expect that China will not remain primarily a low-wage economy. It will be important for China to develop in directions that the EU has chartered for its newly acceded, transitioning, middle-income countries in Central and Eastern Europe. Those countries are beginning to perceive the need to develop the more sophisticated industries that have promoted higher, "new economy" productivity in the United States since the middle of the 1990s. The development of sectors with significant R&D activities promoting information and telecommunications technologies, a sectoral complex of pharmaceutical/biological/medical products and services, and other high-tech industries will be important at some juncture in China's future. It is not too early to begin developing in these directions and such development has in fact begun. Chinese companies and joint venture partners are producing increasingly sophisticated processes and products in the information technology, chemical, pharmaceutical and other high-tech sectors. China is no longer merely a pure, low-cost industrial producer; it is becoming a credible centre for low-cost R&D in certain industries. Representative of this development, Japan has recently provided the China Export and Import Bank (Eximbank) loans of 5.59 billion yuan (US \$698.75 million) for six Chinese provincial government departments to pursue nine projects in underdeveloped areas of the Anhui, Guizhou, Henan, Hunan and Jilin provinces and the autonomous region of Guangxi Zhuang. The race is to improve local infrastructure, environmental protection, education, energy production and scientific research (China Internet Information Center, 2003). These loan projects include a poverty relief program in the Hunan province, a comprehensive environmental improvement project in Guangxi, the establishment of urban natural gas networks in Henan and Anhui, as well as an array of educational programs for Anhui, Guangxi, Guizhou, Henan and Jilin regions.

As a part of the development of the regions that have heretofore been disadvantageded in China, consideration should be given to establishing or upgrading a number of universities capable of serving as a part of the complex of institutions that can promote such development. Goldstein and Renault (2004) have written on the contributions of universities to regional economic development and conclude that they can be significant. Their research efforts, their creation of human capital through teaching and research functions, their initiatives in developing and transferring technology are important for regional development. Sometimes they also contribute significantly to agglomeration economies. Frequently, significant knowledge spillovers can result from their research and technology functions. These will unquestionably assist in the promotion of regional economic development.

Playing that educational, R&D role will lead the way into the future. As we saw in a previous discussion, the university, along with other pure and applied research institutions, will be an integral part of the substructure of the “new” or information economy that will stimulate reorganization in the commercial sector to accommodate and apply the technological and information innovations that will increase labour productivity and make the overall economy competitive in the future.

We conclude that China should choose some important cities from the Central and Western regions to absorb FDI, such as Wuhan city in Hubei province, Chengdu city in Sichuan province, and Xian city in Shanxi province. The econometric results show that FDI affects economic growth and these cities have become core cities. Their newly developed economic influence should be expanded geographically.

Viewing the quantitative results we have presented, it is apparent that consumption has had little effect on Chinese economic growth. To secure more effective growth, the government should change its approach from an ongoing expansion of investment to an increase in consumption, and it has indicated that it intends to do so. The public sector can still appropriately develop infrastructure as needed. It should also expand fiscal expenditures in lagged regions for education and pensions.

We interpret China’s current situation and recent historical development to suggest emphasis on regional specialization, as different regions have their own advantages and potential. The western region might develop tourism and other non-manufacturing pursuits. Even for China, the age of manufacturing should not be viewed as permanent and is in some places already prepared for relative decline. Clearly, the government should permit and encourage greater mobility. Facilitating rather than inhibiting migration (emigration from the western provinces to the eastern regions, for example) should be policy. Issues of the identification and status of agricultural labourers, and assistance with health care and education should be pursued to achieve the ends of regional development.

Figure 1
Productive Returns in Regions of Diverse Development Levels

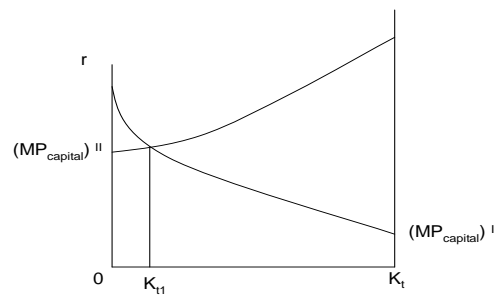


Table 1	
FDI Effects in European Countries	
1. Czech Republic log(gdp)=0.2252+0.9102log(I-FDI)+0.27log(FDI) (0.15) (6.9) (6.37) R ² =0.931 D.W=2.73 F=27.08	13. Luxembourg: insufficient FDI data
2. Denmark log(gdp)=5.691+0.5496log(I-FDI)+0.0856log(FDI) (2.52) (2.55) (3.25) R ² =0.771 D.W=2.3 F=6.74	14. Hungary log(gdp)=0.903+0.8923log(I-FDI)+0.2429 log(FDI) (0.77) (8.21) (4.11) R ² =0.974 D.W=3.12 F=36.95
3. German log(gdp)=12.98+0.088log(I-FDI)+0.0398log(FDI) (4.10) (0.4) (0.94) R ² =0.214 D.W=0.41 F=0.82	15. Malta log(gdp)=6.218+0.1034log(I-FDI)+0.2433 log(FDI) (3.07) (0.943) (0.99) R ² =0.506 D.W=1.52 F=0.52
4. Estonia Log(gdp)=2.302+0.738log(I-FDI)+0.193log(FDI) (5.21) (9.42) (4.882) R ² =0.979 D.W=1.80 F=139.7	16. Netherlands log(gdp)=6.329+0.36log(I-FDI)+0.26 log(FDI) (3.05) (2.61) (3.77) R ² =0.705 D.W=1.33 F=7.16
5. Ireland gdp=-2123.16+4.4946(I-FDI)+4.3838 (FDI) (-0.20) (9.30) (10.8) R ² =0.975 D.W=1.82 F=58.42	17. Austria log(gdp)=-4.60+1.542log(I-FDI)+0.0579log(FDI) (-1.78) (6.48) (4.02) R ² =0.876 D.W=2.89 F=21.28
6. Greece: insufficient FDI data	18. Poland log(gdp)=-2.08+1.509log(I-FDI)-0.17log(FDI) (-0.62) (4.24) (-1.42) R ² =0.819 D.W=1.58 F=9.06
7. Spain log(gdp)=5.753+0.5839log(I-FDI)+0.0723 log(FDI) (15.19) (15.41) (7.43) R ² =0.994 D.W=2.27 F=533.81	19. Portugal log(gdp)=5.54+0.528log(I-FDI)+0.10log(FDI) (3.06) (2.82) (3.10) R ² =0.819 D.W=0.75 F=13.64
8. France log(gdp)=4.8577+0.668log(I-FDI)+0.101 log(FDI) (1.69) (2.58) (2.99) R ² =0.961 D.W=1.20 F=61.36	20. Romania: insufficient FDI data 21. Slovenia: insufficient FDI data
9. Italy log(gdp)=2.565+0.9297log(I-FDI)+0.0019log(FDI) (4.27) (16.98) (0.20) R ² =0.993 D.W=1.23 F=412.57	22. Slovakia log(gdp)=8.69+0.178log(I-FDI)-0.007log(FDI) (0.78) (0.19) (-0.02) R ² =0.32 D.W=1.29 F=0.25
10. Cyprus log(gdp)=3.354+0.474log(I)+0.393log(FDI) (2.788) (3.62) (6.138) R ² =0.904 D.W=2.59 F=18.87	23. Finland log(gdp)=6.22+0.459log(I-FDI)+0.12log(FDI) (7.41) (5.62) (6.76) R ² =0.916 D.W=1.49 F=32.5
11. Latvia log(gdp)=5.54+0.441log(I-FDI)+0.038log(FDI) (3.17) (3.54) (0.22) R ² =0.837 D.W=1.79 F=10.29	24. Sweden log(gdp)=5.20+0.533log(I-FDI)+0.19log(FDI) (3.90) (4.78) (5.09) R ² =0.915 D.W=2.39 F=16.19
12. Lithuania log(gdp)=-0.146+1.092log(I-FDI)+0.1999 log(FDI) (-0.11) (8.09) (3.26) R ² =0.946 D.W=2.13 F=35.03	25. United Kingdom log(gdp)=7.98+0.279log(I-FDI)+0.25log(FDI) (3.39) (1.38) (9.74) R ² =0.973 D.W=2.58 F=54.34

Table 2
Positive FDI Effects in Chinese Provinces

2. Tianjin city. log(gdp)=1.868+0.783log(I-FDI)+0.68log(FDI) (3.48) (16.7) (1.41) R ² =0.989 D.W=2.50 F=193.23	5. Neimenggu autonomy district. Log(gdp)=2.915+0.632log(I-FDI)+0.1258log(FDI) (5.90) (7.7) (1.43) R ² =0.953 D.W=2.07 F=40.50
6. Liaoning province. log(gdp)=3.26+0.684log(I-FDI)+0.0486log(FDI) (5.46) (7.3) (0.73) R ² =0.949 D.W=1.23 F=37.59	7. Jilin province Log(gdp)=-0.509+0.987log(I-FDI)+0.172og(FDI) (0.37) (6.7) (1.25) R ² =0.9837 D.W=2.05 F=120.92
10. Jiangsu province log(gdp)=2.15+0.715log(I-FDI)+0.17log(FDI) (4.68) (6.07) (1.51) R ² =0.985 D.W=1.536 F=128.57	11. Zhejiang province. lg(gdp)=6.42+0.26lg(I-FDI)+0.154lg(FDI) +0.89AR(1) (3.05) (3.17) (1.34) (3.32) R ² =0.9987 D.W=2.4 F=513.12
13. Fujian province lg(gdp)=0.68+0.91lg(I-FDI)+0.16lg(FDI) +0.065AR(1) (1.94) (32.1) (5.69) (0.489) R ² =0.992 D.W=1.376 F=256.69	15. Shandong province Log(gdp)=0.855+0.9186log(I-FDI)+0.11164log(FDI) (1.56) (9.45) (2.22) R ² =0.996 D.W=2.51 F=566.97
16 Henan province log(gdp)=0.17+1.07log(I-FDI)+0.05log(FDI) (0.29) (20.59) (0.83) R ² =0.99 D.W=1.54 F=389.40	17. Hubei province Log(gdp)=1.965+0.605log(I-FDI)+0.4127log(FDI) (1.99) (3.62) (5.28) R ² =0.981 D.W=2.048 F=99.68
20. Guangxi autonomy district. log(gdp)=3.36+0.63log(I-FDI)+0.05log(FDI) (2.83) (4.63) (0.58) R ² =0.936 D.W=1.939 F=29.18	21. Hainan province log(gdp)=0.413+0.874log(I-FDI)+0.327log(FDI) (0.77) (15.72) (4.78) R ² =0.994 D.W=2.315 F=318.77
23. Sichuan province log(gdp)=2.38+0.77log(I-FDI)+0.07log(FDI) (5.54) (10.98) (1.43) R ² =0.983 D.W=2.269 F=118.34	24. Guizhou province Log(gdp)=3.146+0.5889log(I-FDI)+0.11099log(FDI) (13.87) (17.69) (2.70) R ² =0.988 D.W=2.89 F=162.92
27. Shanxi province log(gdp)=3.07+0.63log(I-FDI)+0.045lg(FDI) 0.51AR(1) (23.04) (34.34) (1.21) (-1.45) R ² =0.9975 D.W=1.86 F=266.47	28. Gansu province Log(gdp)=1.939+0.81log(I-FDI)+0.03log(FDI) (4.78) (12.45) (0.96) R ² =0.975 D.W=3.11 F=77.77
29. Qinghai province log(gdp)=2.306+0.64log(I-FDI)+0.002log(FDI) (14.09) (20.65) (0.69) R ² =0.994 D.W=1.453 F=341.60	

Table 3
Chinese Provinces Without Significant FDI Effect

<p>1. Beijing city $\log(\text{gdp})=0.7935+1.0685\log(\text{I-FDI})-0.15 \log(\text{FDI})$ (1.15) (15.5) (-1.173) $R^2=0.9844$ D.W=3.19 F=128.58</p>	<p>3. Hebei province. $\log(\text{gdp})=0.019+1.103\log(\text{I-FDI})-0.0007\log(\text{FDI})$ (0.03) (14.9) (-0.0139) $R^2=0.987$ D.W=1.34 F=155.05</p>
<p>4. Shanxi province. $\log(\text{gdp})=3.126+0.695\log(\text{I-FDI})-0.089\log(\text{FDI})$ (2.88) (5.876) (-0.643) $R^2=0.937$ D.W=2.23 F=29.8</p>	<p>8. Heilongjiang province. $\log(\text{gdp})=2.549+0.866\log(\text{I-FDI})-0.141\log(\text{FDI})$ (1.49) (3.99) (-1.388) $R^2=0.88$ D.W=2.008 F=14.92</p>
<p>9. Shanghai city. $\log(\text{gdp})=-0.608+1.325\log(\text{I-FDI})-0.167\log(\text{FDI})$ (-0.55) (9.1) (-1.27) $R^2=0.966$ D.W=2.20 F=42.79</p>	<p>12. Anhui province $\log(\text{gdp})=0.29+1.134\log(\text{I-FDI})-0.066\log(\text{FDI})$ (0.25) (6.34) (-0.54) $R^2=0.915$ D.W=1.43 F=21.63</p>
<p>14. Jiangxi province $\log(\text{gdp})=2.1435+0.84\log(\text{I-FDI})-0.03\log(\text{FDI})$ (2.82) (6.26) (-0.68) $R^2=0.96$ D.W=1.55 F=48.77</p>	<p>18. Hunan province $\log(\text{gdp})=2.55+0.81\log(\text{I-FDI})-0.03\log(\text{FDI})$ (14.11) (30.69) (-0.85) $R^2=0.996$ D.W=2.736 F=564.30</p>
<p>22. Chongqing city $\log(\text{gdp})=3.828+0.57\log(\text{I-FDI})-0.040\log(\text{FDI})$ (47.60) (65.42) (-3.86) $R^2=0.9994$ D.W=2.216 F=3476.3</p>	<p>25. Yunnan province $\log(\text{gdp})=3.07+0.68\log(\text{I-FDI})-0.0039\log(\text{FDI})$ (1.42) (2.48) (-0.02696) $R^2=0.823$ D.W=2.069 F=9.3</p>
<p>26. Xizang autonomy district.(Tibet) Region receives too little FDI. No data available.</p>	<p>30. Ningxia autonomy district. $\log(\text{gdp})=2.8+0.55\log(\text{I-FDI})-0.0107\log(\text{FDI})$ (44.66) (44.47) (-1.307) $R^2=0.998$ D.W=2.42 F=1023.56</p>
<p>31. XinJiang autonomy district. $\log(\text{gdp})=5.76+0.286\log(\text{I-FDI})-0.82\log(\text{FDI})$ (2.92) (1.06) (-1.95) $R^2=0.891$ D.W=1.916 F=16.418</p>	