Geography, trade and regional development: the role of wage costs, exchange rates and currency/capital movements

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Abstract

Existing theories of geographical specialization and trade can be classified into four groups: supply-side; demand-side; endogenous growth and institutional models. In the recent past, economic geographers have paid little attention to earlier regional economic analysis and concentrated for the most part on detailed examination of production structures, the chains linking upstream and downstream activities into production and value networks, clusters, institutions and more recently, economic evolution. As a result, existing economic geography is ill-equipped to deal with the impact of some aspects of the evolution of costs, exchange rates, trade and capital flows on regional development and pays relatively little attention to economic calculation. Geographical economics includes an underlying theory of trade and micro-foundations, yet its supply-side approach neglects the role of monetary and demand-side (except in gravity models of trade) factors. The aim of this article is to argue for an extension of existing theoretical frameworks to embrace these issues in the light of recent trends in global economic geography and successive financial and debt crises that have stricken the developed world.

Keywords: Trade, regional development, trade surpluses and deficits, capital movements, absolute and comparative advantage, international values

JEL Classifications: F10, F11, F13, F21, F31, F32, F63, O10, R10, R11

Date submitted: 6 September 2012    Date accepted: 11 July 2013

1. Introduction

Efficiency wage costs, exchange rates and currency and capital movements profoundly shape the world economy and global economic geography. The establishment of sustained low exchange rates of East Asian currencies after the Asian financial crisis were important drivers of their relative competitiveness, of export-oriented investments in East Asia by foreign-invested companies and of changing geographies of economic activities; the depreciation of a currency can reduce the costs of imported necessities such as food, clothing, appliances and furniture helping reduce relative wage costs and directly affects relative profitability and international prices. These changes in industrial structure and competitiveness saw the emergence of large and growing trade surpluses...
and deficits, the accumulation by emerging economies of large foreign currency reserves and the growth of large Sovereign Wealth Funds. These developments marked a significant shift in the global distribution of wealth and had major impacts on asset markets and the ownership of economic assets. Italy’s adoption of the Euro closed off the option of devaluation that had long helped sustain the competitiveness of Italian industrial districts. More generally, in the European Union, peripheral Mediterranean countries suffered from increasing trade deficits with Germany funded by loans that contributed to the subsequent crises of government debt, the Euro zone crisis and the recession with its profound impacts on the geographies of output and employment.

In the recent past economic geographers (EG) and to a lesser extent geographical economists (GE) have paid relatively little attention to these drivers of the geography of economic activities, area specialization, trade and regional dynamics. In the past it was less the case as considerable attention was paid to concepts of absolute and comparative advantage, regional specialization and regional development, although this research paid little attention to wage costs, exchange rates, financial factors and adjustment mechanisms. The aim of this article is to help fill this gap, emphasizing the continuing importance of some older ideas, while amending them to incorporate normally unexamined adjustment mechanisms and monetary and demand-side factors.

In the past, EG drew mainly on a series of theories of the location of economic activities that rested on neoclassical theories of profit maximizing firms and utility maximizing consumers, while urban and regional economics included macroeconomic theories of the overall trajectories of urban and regional economies. Earlier commercial geography paid considerable attention to specialization and trade, yet when theoretical explanation was sought, geographers simply drew on the economics profession’s theories of comparative advantage (Chisholm, 1966). More recent research has, for the most part, adopted new points of departure and in some cases engaged with other disciplines such as management (Porter, 1990). A rapid succession of approaches have significantly helped explain the dynamism of local economies (Nelson and Winter, 1982; David, 1985; Granovetter, 1985; Scott, 1988; Arthur, 1994; Amin and Thrift, 1995; Storper, 1995; Boschma and Lambooy, 1999; Bathelt et al., 2004; Boschma, 2004; Coe et al., 2004; Boschma and Frenken, 2006; Martin and Sunley, 2006, 2007; Sunley, 2008; Becattini et al., 2009; Martin, 2010, 2011; Martin and Simmie, 2010). These approaches have prompted a renewed interest in concepts of cumulative causation refining some of the original concepts in the shape of ideas about path dependence.

These theories, however, have little to say about the reshaping of global economic geography and are unable to provide an ‘insight [in]to connecting factors between evolutionary economic geography and concepts from urban and regional economics’ (Heblich, 2011). As MacKinnon et al. (2009) point out, these approaches concentrate on micro-scale actors, routines, networks and processes. Overall costs and profitability relative to national and global rivals receive relatively little attention: the richness of analyses of actors and institutions should not lead EGs to overlook the significance of costs, cost recovery, profitability and the factors that shape them including a currency’s exchange value. These theories also concentrate on the immediate environment. An examination of temporal movements and spatial variations in comparative development requires however that attention be paid to a multi-scalar context which brings into
play distant rivals and meso- and macro-level trends and conditions relating to investment, demand and costs. These considerations play some part in global value chain and global production network research (Henderson et al., 2002; Coe et al., 2010; Coe, 2012, 390, 395), yet its analytical core is underdeveloped and requires an analytical re-interpretation of theories of absolute and comparative advantage.

The new GE also recognizes the significance of cumulative causation and endogenous growth offering a dynamic approach to the evolution of economic landscapes. In addition, it seeks to establish micro-foundations, albeit based on individual optimizing behaviour. In other respects however it is quite different. GE uses formal modelling methods, yet more importantly for this article, it grew out of the increasing returns revolution in trade theory and can be seen as an attempt to go behind Heckscher–Ohlin (HO) theories of trade: while HO theories see specialization and trade as driven by resource endowments, GE shows that second nature (humanly created) resource endowments are results of the creation of underlying economic and demographic landscapes (Krugman, 1991; Fujita et al., 1999). In developing international trade models GE confines itself, however, to modelling the impacts of backward and forward linkages (external economies) and transport costs on industrial specialization in worlds in which labour is internationally immobile. If logistic costs including the costs of currency transactions were used, these models could incorporate exchange rates and some other border costs, yet this step would not overcome the omission of some vital adjustment issues.

These GE models embody a predominantly real, supply-side approach, and involve the consideration of some drivers of growth as exogenous. All economies are considered to be in, or near and approaching, a state of equilibrium in which all resources are fully and efficiently utilized. In a world of increasing returns however the mechanisms driving change are largely endogenous and cumulative. Full employment is far from guaranteed. Changes in the use of resources and in production organization are not just equilibrating but also disequilibrating, creating new opportunities and altering development pathways (Kaldor, 1972).

More specifically, economic development processes can be viewed as a never-ending interaction in which changes in supply give rise to changes in demand and changes in demand give rise to changes in supply. A decision to increase the production of one commodity gives rise to changes in the demand for inputs, complements and substitutes and increases expenditure and the income of their producers. An increase in credit creates deposits and permits increased investment expenditure, modifying the structure of employment, and increasing the supply of goods which, if sold, raise incomes to generate the savings required to repay the initial investment finance.

In this conception of decentralized economic systems, growth is largely directed by the evolution of demand rather than by the capacity to produce as in supply-side theories. Changes in the capacity to produce depend on the accumulation of physical and human capital and the speed of technological progress which themselves depend upon investment expenditure and the provision of credit. Investment expenditure is a component of aggregate demand: not only therefore does demand determine short-term growth when an economy is operating at less than full capacity; growth in the long-term depends upon the succession of decisions about investment and other components of aggregate demand. Added together, these decisions give rise to constant shifts in the speed and direction of development, adverse shocks and periodic crises that require adaptation and adjustment. An adverse shock can cause one country to lose industries
to another with ‘no mechanism for the return of these industries’ once the shock is absorbed (Fujita et al., 1999, 304). Amongst these adjustment mechanisms that shape economic trajectories are shifts in efficiency wage costs, exchange rates and currency and capital movements that we shall examine in this article.

The rest of the article proceeds in the following way: to justify consideration of these mechanisms, the next section sets out a set of stylized facts about recent economic development that economic geography should see to explain. In the third section a conceptual framework that embraces trade-related wage and exchange rate adjustment and capital flows is developed to make sense of the dynamics of regional economies integrated into a global order. Section 4 insists on the importance of the idea that a regional economy can be represented by sets of economic accounts recording flows of income and a corresponding set of capital accounts, while Section 5 presents a reformulation of the principle of comparative advantage that gives considerable analytical weight to the advance of money, incomes and demand. The final section concludes.

2. World economic geography and the performance of regional economies

A reason why it is surprising that recent economic geography theories have paid relatively little attention to exchange rates, investment, cost competition and trade is that these drivers have played a profound role in reshaping world economic geography and the performance of regional economies.

The economic crisis of the 1970s saw major changes in the trajectories of national and regional economies. Up until that point in time, in developed countries, the growth of domestic demand played a major role in driving economic growth and development. In the case of USA, exports stood at just 5.2% of gross domestic product (GDP) in 1960 and 5.8% in 1970, while in the EURO zone they stood at 18.6% in 1960 and 19.8% in 1970. The 1970s crisis and neo-liberal globalization saw a significant reorientation of growth and development towards external markets: in the case of developed countries, increased wage costs and social conflict saw significant outward flows of invest-ment to lower cost countries, while imports and exports increased as shares of regional and national output and employment. In the case of the USA and the EURO zone, exports reached 12.7 and 41.1%, respectively, in 2007 (OECD, various years).

At the root of these transformations were a number of factors. In the case of the EURO zone economic integration was an important factor. Of more general importance however were gaping global disparities in wealth and income. These disparities meant that relocation in low cost countries could generate large reductions in efficiency wages at international exchange rates, although a large-scale geographical redistribution of economic activities could not have taken place without significant investments in improved communications and the general conditions of production and exchange and increased global economic and political integration. Complementary shifts accordingly occurred in less-developed countries. From the 1930s until 1960s many developing countries had pursued strategies of import substitution designed to replace imports with domestically produced goods and services (Hirschman, 1968). At the end of the 1950s and in the 1960s, the small East Asian Tiger economies adopted
export-oriented growth strategies (Balassa, 1978; Amsden, 1985). Their subsequent achievement of high and sustained growth rates saw a more general move away from import substitution and towards export promotion.

The 1997 Asian crisis led initially to a certain degree of scepticism about the real strengths of Asian growth. Indeed a number of economists concluded from growth accounting exercises that Asian growth reflected perspiration rather than inspiration, and that their rise would fade much as the rise of the Soviet bloc faded after the 1970s (Krugman, 1998; see also Young, 1992).

In the event the Asian crisis and its sequels in Russia, Brazil and Argentina helped change emerging-developed country relationships and the course of global development. The Asian economies responded strongly to the dangers of financial liberalization and dollar debts, altering their model of development to emerge with trade surpluses and as creditors of the USA and other developed capitalist economies. Asian domestic markets declined in importance, as Asian manufacturers reduced prices and increased export volumes: excess capacities of production, compressed margins and currency depreciation made these countries formidable trade competitors and drove down world prices. The arrival of cheap imported goods put strong downward pressure on profitability in developed countries and encouraged recourse to financially driven growth. In 1998–2000, a speculative financial boom associated with over-optimistic projections of internet-led growth encouraged household consumption and firm investment in new projects, generating serious problems of overproduction. Surprisingly, the Anglo-American economies responded quickly to the dotcom crisis: the monetary policy of the authorities drove down interest rates, credit markets were liberalized and a large inflow of savings from Asian and oil producing economies with large trade surpluses saw an explosion in the supply of credit, underpinned by house price increases to which credit expansion contributed. The consequences were 2-fold. The first was an extraordinary polarization of trade surpluses and deficits (globally and inside of trading blocs such as the European Union). The second was a dramatic increase in the foreign exchange holdings of emerging economies such as China enabling them to embark on processes of internationalization (Figure 1).

These imbalances have led to intense arguments about the exchange rate of surplus economies such as China and to sovereign debt crises in deficit countries such as Greece, Spain, Portugal and Ireland in the Euro zone. China strongly resists Western pressure to increase its exchange rate in part in the light of the Japanese experience. After the 1985 Plaza Accord, a sharp appreciation of the Yen caused a recession (Figure 2). A macroeconomic programme to stimulate growth resulted in credit growth and soaring asset values. In 1990, the financial bubble burst opening the way to two lost decades marked by dismal economic performance. As far as Euroland is concerned, current Mediterranean sovereign debt crises are connected with the inability of their currencies to continue to fall in value to restore competitiveness after adoption of the Euro (Figure 2; Dunford and Yeung, 2011).

Asian cost competition is also reflected in increasing international trade frictions with Europe and the USA in a wide range of sectors. In October 2011, Germany’s Solar World AG’s US subsidiary fronted a petition alleging that Chinese companies are selling solar cells and modules at prices below costs of production and have received 200 government subsidies. The petition was prompted by several factors. One was the bankruptcy of Solyndra, a solar panel maker that received a $0.5 billion US federal
Figure 1. Current account balance in different regions, 1980–2008. Elaborated from International Monetary Fund (IMF), 2013.
government loan and two other companies. Another was soaring Chinese imports rising from $21.3 million in 2005 to $2.65 billion in 2011. In December 2011 the US USITC upheld the complaint, opening the way for the US Department of Commerce to impose proposed antidumping and countervailing duties. Shortly after, in Gemany’s Solar Valley Q-Cells filed for bankruptcy, while Solar World announced its intention to instigate trade investigations in the European Union, prompting Chinese concerns about a looming trade war (Dunford et al., 2013).

3. Conceptualizing regional economies in a differentially integrated global order

These developments indicate the importance of exchange rates, investment, cost competition, trade and growth considerations that have played a relatively small role in recent economic geography. There are several reasons for these absences: geographers have paid little attention to trade (Andresen, 2010; Sheppard, 2012); research that deals
with value chains and geographies of trade does not deal with trade theories (Sheppard, 2012), though EG concentrates on real or institutional, micro-economic supply-side approaches to the study of economic development.

To deal with these developments, existing EG theories must be extended to embrace a number of issues: monetary issues associated with the polarization of surpluses and deficits and the growing importance of Sovereign Wealth Funds accumulated by surplus countries; adjustment issues including movements in exchange rates, wages and currencies and demand-side mechanisms that involve connecting the supply-side with income distribution, investment and market demand (Hudson, 2005, 21–37).

Figure 3 outlines a conceptual framework that embraces many of the issues that require attention in making sense of the dynamics of regional economies integrated into a global order. Existing EG and GE theories explore the evolution of resource endowments and productive systems and the ways in which regional resource endowments shape specialization, though only GE pays much attention to cost competitiveness (Figure 1). Cumulative causation and endogenous growth ideas entail analysis of the ways in which regional evolutions transform these endowments. EG (but not GE) pays significant attention to enterprise and regional institutional and governance structures, although it rarely considers national and international scale structures. These approaches, therefore, examine the ways in which trade, in the case of GE and growth are not simply a result but also a cause of conditions of production and exchange and recognize the significance of local governance. These developments amount to a significant step forward. What is missing however is sufficient attention to:

(i) the interaction of money wage and other costs and exchange rates in driving

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**Figure 3.** Geography, cumulative causation, trade and international payments. *Source: Aglietta (1982) and extended.*

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competitiveness and economic adjustment on the one hand and (ii) a concern with international and regional payments issues and of impacts on income, expenditure and demand, considered in some research in regional economics and Keynesian demand-side approaches to trade (Kaldor, 1970).

The rest of this article deals with two insufficiently examined aspects of this framework. In Section 4, regional enterprises and input–output relationships are situated into a wider system of accounts for regional economies emphasizing the importance of the relationship between studies of economic evolution and urban and regional dynamics including the trajectories of export-oriented industries and the capacity of industries serving local markets to compete with imports. To explain the impact of extra-regional competition, Section 5 demonstrates the significance of exchange rates and monetary adjustment mechanisms for the principle of comparative advantage. The conclusion connects these ideas with the principle of cumulative causation and considers the implications of these theoretical arguments for contemporary economic geography.

4. Systems of accounts and urban and regional economies

A regional approach to economic geography rests on a conception of the world as a constellation of national/regional institutional configurations and interests with different resource endowments and different degrees of autonomy that shape economic trends (Figure 3). Movements of capital, people and goods and services lead to the creation of global, trans-national and inter-regional organizations, chains and networks. Trade along with international investments and movements of people and goods are some of the (asymmetric) ways in which varying national models of development are integrated with one another, as are the financial flows with which they are associated. These asymmetries reflect the ever changing hierarchical relationships between nation states and economic blocs. Integration, interaction and interdependence modify the internal structure and dynamics of national and sub-national configurations and generate international/global disequilibria. In some cases economic integration is accompanied by closer political integration and a decline in national autonomy. The division of the world into national and regional institutional configurations remains however a fundamental foundation of the international and national economic order.

A comprehensive analysis of trade, growth and development must examine the underlying multi-scalar geography, institutional conditions and social relations of this global order. EG and GE have made significant contributions to this area of study, as has much research that is more general in character.

The starting point of this article is however different, resting on the idea that a regional economy can be represented by sets of economic accounts recording flows of income and a corresponding set of capital accounts. Figure 4 indicates the scope of a complete set of income accounts. All of the entries in this table are expressed in money terms. This approach is both limited and advantageous. It is limited in that the relationship between values and material things is not examined. It is advantageous in that difficulties associated with the physical measurement of heterogeneous capital goods are avoided. Every industry is given a production account. The information on inter-industry transactions indicates the structure of production within an economy.
from the point of view of the dependence of any industry on other industries either as a supplier of inputs or as a purchaser of outputs. Over time, these industries co-evolve as

<table>
<thead>
<tr>
<th>Debits of/ Credits of</th>
<th>Production account</th>
<th>Appropriation account</th>
<th>Accumulation account</th>
<th>External account</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production account</td>
<td>Intermediate products (O)</td>
<td>Final consumption (C)</td>
<td>Gross investment (V)</td>
<td>Exports (X)</td>
<td>Gross output (q)</td>
</tr>
<tr>
<td>Appropriation account</td>
<td>Net value added by factors of production or income (Y)</td>
<td>Current transfers (T)</td>
<td></td>
<td>Property income from abroad €</td>
<td>Income (y)</td>
</tr>
<tr>
<td>Accumulation account</td>
<td>Depreciation (D)</td>
<td>Net savings (S)</td>
<td>Capital transactions (F)</td>
<td>Capital transfers (net) from ROW (H)</td>
<td>Gross savings (k)</td>
</tr>
<tr>
<td>External account</td>
<td>Imports (M)</td>
<td>Current transfers (net) to ROW</td>
<td>Net investment abroad (B)</td>
<td></td>
<td>Imports and income outflows (x)</td>
</tr>
<tr>
<td>Totals</td>
<td>Gross output (q)</td>
<td>Income (y)</td>
<td>Gross investment (k)</td>
<td>Exports and income from abroad (x)</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 4.** Accounts for a regional economy.

The inverse $(I-A)^{-1}$, a sufficient condition for whose existence is that $A^i<1$ is known as the matrix multiplier. The solution for income, $y$, can be found by multiplying the elements of the vector $q$ by the proportions which factor incomes bear to total output in each industry, or by the complements of the proportions represented by total intermediate inputs. The input–output part of this system of accounts has been widely used in regional economics and has indeed been extended to create multi-regional models that explore the transactions within and between regions. Interregional linkages have important implications for the effects of an expansion of demand on a regional economy. Suppose that two regions have the following matrix multipliers:

$$(I - A^E)^{-1} = \begin{bmatrix} 1.0 & 0.3 \\ 0.3 & 0.4 \end{bmatrix}$$

$$(I - A^p)^{-1} = \begin{bmatrix} 1.9 & 0.7 \\ 0.7 & 1.8 \end{bmatrix}$$
do the relationships among them. These production linkages are studied in GE and EG. Figure 4 also includes three other accounts that are much less studied: an appropriation account (recording income and expenditures), an accumulation account (recording saving, net lending, investment, acquisition and disposal of financial and non-financial assets and liabilities) and an external account (recording transactions with other regions). The totals (gross output, income, gross savings and investment and exports and imports) are defined on the assumption that the accounts are consolidated (meaning that the items on the principal diagonal are set equal to zero).

5. Specialization and the international division of labour: the principle of comparative costs reinterpreted

In this world of relatively independent political and economic jurisdictions, national specialization, the international division of labour and international trade were traditionally seen as driven by comparative advantage (Ricardo, 1817). In the 1920s and 1930s this approach was modified in that comparative costs were seen as reflecting the underlying geography, production factors or resource endowments (Heckscher, 1919; Ohlin, 1933). According to the H–O theorem, a capital-abundant country exports capital-intensive goods to labour-abundant countries, while importing labour-intensive commodities in return. Assuming that the production factors (labour and capital) are mobile within countries but immobile between them, Samuelson’s (1949) factor price equalization theorem predicts that in a perfectly competitive world the prices of all factors along with those of traded goods will converge. Trade was finally seen as something from which everyone gains. Of these arguments, the claim that trade is driven by comparative advantage is widely although not universally accepted. The other two claims are contested, while the neoclassical trade theory prediction of regional income convergence has not materialized (see Durlauf et al., 2005; Sheppard, 2012).

As trade also occurred between similarly endowed countries in goods produced with similar factor intensities, new theories were developed. Krugman (1979, 1991) attributed international trade between similar countries and the geographical concentration of wealth to economies of scale and consumer preferences for diverse goods and services and also identified the potential significance of the size of the domestic market (a demand-side factor). In growth theory, Romer (1986) and Lucas (1988) incorporated increasing returns to capital arising from the accumulation of knowledge into new (endogenous) growth models, and showed that learning by doing, education and human capital formation could explain the polarization of income associated with the relatively faster growth of developed countries (Romer, 1994). GE added a further step examining the ways in which resource endowments are created as a result of the creation of economic landscapes.

Suppose also that the demand for the products of industry 1 in region 1 increases by £100 million. The multiplier attached to industry 1 in region 1 is equal to the sum of the column elements, or 1.3, so that output in region 1 expands by (1.3) (£100 million) = £130 million. Assume, however, that industry 1 in region 1 always buys 50% of its inputs from activity 1 in region 2. In these conditions, the demand for region 2’s exports increases by £50 million. As the multiplier for activity 1 in region 2 is 2.6, output in region 2 will expand by (2.6) (£50 million) = £130 million. Additional feedbacks are likely to occur from region 2 to region 1, while a complete interregional input–output table would be more useful than tables for closed regions and import coefficients (see also Thirlwall, 1974, 5–10).
These models have a number of implications. First, there is a feedback from trade and growth to the evolution of factor endowments making the development of industrial activities and industrial areas path dependent and cumulative as was clearly anticipated in earlier studies of cumulative causation (Myrdal, 1957) and in dynamic versions of trade theory such as the Asian flying geese paradigm (Akamatsu, 1962). Second, increasing returns and network externalities give rise to monopolistic competition and oligopolistic markets (Dixit and Stiglitz, 1977). Third, increasing returns open the way to a case for strategic industrial policies (see Amsden, 1985, 1989).

These models rest, however, upon a number of unrealistic assumptions (Sheppard, 2012) and in many cases rely on an aggregate production function linking quantities of heterogeneous production factors measured in physical terms with rewards to factors of production. As Steedman (1979) showed however the complications that arise for neoclassical trade theory due to the reswitching problem can be avoided by comparing prices of production. It is precisely for this reason that the starting point of this article is an expression of a regional economic structure in money value terms.

Models and explanations that draw on the idea of comparative or competitive advantage usually pay no attention to monetary mechanisms. At present, the values of most goods and services and the conditions governing the reproduction of the wage earning class are formed at a national level, sometimes in the light of international comparisons. National structures and processes of regulation are characterized by varying degrees of long-term autonomy. National (and regional) differences in the development of the wage-earning class, the process of wage determination and the conditions of production and exchange are constantly recreated.

As a result of these varying systems of regulation and national histories of investment, national (and regional) systems of production differ. As a result comparative costs also differ. These costs are expressed in money terms in a national currency. As wages are an important driver of costs, and as we want to identify their effects, we shall suppose that money costs can be expressed as the number of hours of labour that they command, and we shall suppose, as did Ricardo, that the costs of production in two countries are the ones set out in Table 1. More specifically, these costs are interpreted as quantities of direct and indirect labour commanded by the wage weighted by a rate of profit/mark-up which itself will reflect the difficulty of producing wage goods in the country concerned. These costs include all logistic costs (including exchange rates, tariffs and so on) associated with the delivery of goods and services to intermediate and final purchasers. In this situation, multiplying them by the money wage yields prices of production.

Algebraically, suppose that $a_{ij}$ is the quantity (in value terms) of good $i$ normally required to produce 1 unit of good $j$, and that $A$ is the corresponding matrix of input–output coefficients where $A$ is (i) non-negative and indecomposable and (ii) non-singular. If $l$ is the vector of quantities in money terms of abstract labour

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2 A scientific theory as opposed to an axiomatic theory is one in which the truth content or justification of its propositions depend on their correspondence with sense experience/empirical phenomena. If empirical observations are not consistent with the propositions, the initial hypotheses should be repudiated. In social science, however, the initial assumptions as well as any propositions derived from them should also be subject to empirical validation not in the sense that some considerations can be at least initially set aside (to simplify the analysis) but in the sense that careful attention should also be paid to the validity of assumptions/approximations.
commanded newly added to units of these goods in the period of reproduction, \( r \) is the general rate of profit, \( w \) is the wage share of value added (real social wage cost or wage cost per unit of value produced), the vector of prices of production is given by (see Lipietz, 1982, 76–78):

\[
p = (1 + r)(pA + wI) = wI \left( \frac{1}{1 + r} - A \right)^{-1}
\]

or

\[
p = (1 + r)w \sum_{n=0}^{\infty} (1 + r)^n I A^n
\]

These comparative costs and prices of production therefore summarize the impacts of a wide range of underlying drivers including wages, capital costs, profit rates, value added, input–output relationships, logistic costs, innovations and a whole range of government policies. No assumptions are made about equilibrium of any kind. The costs and prices are merely the ones that prevail at a given point in time and will evolve over the course of time.

To simplify, consider two industries. In the situation depicted in Table 1, Portuguese producers can produce both wine and cloth more cheaply than their English counterparts: the Portuguese have an absolute advantage in the production of both commodities. But in Portugal wine is comparatively cheap, as \( \frac{c_w^P}{c_w^E} = \frac{80}{90} < \frac{c_c^P}{c_c^E} = \frac{120}{100} \), whereas in England cloth is comparatively cheap. Alternatively, Portuguese producers have a comparatively greater advantage over their English counterparts in the production of wine, as \( \frac{c_w^P}{c_w^E} = \frac{80}{120} < \frac{c_c^P}{c_c^E} = \frac{90}{100} \), whereas English producers have a comparatively smaller disadvantage in the production of cloth.

The value of commodities bought and sold on the international market is not formed in the same way as values on the national market. In Ricardo’s example, where the terms of trade were assumed to be 100:100, England ends up exchanging the produce of 100 h of work for that of 80 h. Two points should be made. First, Emmanuel (1972) argued that terms of trade and unequal exchange work instead in favour of rich countries and not, as in this case, against them. Second, for Ricardo this inequality of exchange occurs largely because of the international immobility of capital.

International values are formed as a result of the establishment of a rate of exchange that establishes a correspondence between the price systems of relatively autonomous national economies. International exchange can only be sustained if prices expressed in a common currency lie within certain limits ‘permitting a comparative advantage to be

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<tr>
<th></th>
<th>England</th>
<th>Portugal</th>
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<tbody>
<tr>
<td>Cloth</td>
<td>100 h</td>
<td>90 h</td>
</tr>
<tr>
<td>Wine</td>
<td>120 h</td>
<td>80 h</td>
</tr>
</tbody>
</table>

Source: Ricardo (1817).
expressed as an absolute advantage’, and the international monetary constraint is respected. This constraint requires that, in the absence of net overseas earnings and net international credit, exports should equal imports: in recent years, there was a polarization of surpluses and deficits financed by international capital flows and increased indebtedness of deficit countries.

Suppose that $p^w$ and $p^c$ are the international prices of wine and cloth, and $w^P$ and $w^E$ are the money wages in Portugal and England, respectively, with all quantities being expressed in a common currency. International exchange will only occur if $cw^P < cw^E$ and $cw^P = cw^E$. In other words, it will only occur if the ratio of money wages expressed in a common currency satisfies the constraint $cw^P = 100$ and $cw^E = 120$.3

Suppose that the rate of exchange is equal to 1 unit (escudo) of the Portuguese currency per unit (£) of the English currency, or $e = 1$. Suppose also that the money wage in each country is £0.01. If the price of cloth in England is £1 the average price of cloth in Portugal expressed in units of the English currency is £1.90. Similarly, the prices of wine are £1.20 and £0.80, respectively (see the opening tableaus in Table 2).

In these circumstances, the Portuguese economy has an advantage not only in the production of wine but also in the production of cloth.4 If trade were to occur, the English economy would have a large trade deficit and the Portuguese economy a large surplus. What is required is a mechanism that will raise the international prices of all Portuguese products and lower the international prices of all English products until: (i) English producers can undersell the Portuguese in one of the two commodities, and England’s comparative advantage has been translated into a competitive/absolute advantage, (ii) resources have been transferred to the activities in which each country has a comparative advantage and (iii) the values of each country’s exports and imports have been altered and the balance of payments of the two countries brought into equilibrium. In the absence of these adjustments protectionism, exchange controls and capital transfers would be the only way of avoiding international trade conflicts and national economic crises. In reality imbalances of this kind do occur: as we have already

Table 2. International prices with fixed exchange rates and wage flexibility, where $w^P = w^E$, $w^P = 1.11w^E$ and $w^P = 1.5w^E$

<table>
<thead>
<tr>
<th></th>
<th>$w^P = w^E$</th>
<th>$w^P = 1.11w^E$</th>
<th>$w^P = 1.5w^E$</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>England</td>
<td>Portugal</td>
<td>England</td>
</tr>
<tr>
<td>Cloth</td>
<td>1.00</td>
<td>0.90</td>
<td>0.95</td>
</tr>
<tr>
<td>Wine</td>
<td>1.20</td>
<td>0.80</td>
<td>1.14</td>
</tr>
</tbody>
</table>

Note: Values are expressed in pounds, unless otherwise specified.

3 The inverses of total costs can be interpreted as indices of the productivity of labour employed to produce 1 unit of each type of commodity in the conditions of production prevailing in each country. It follows that each economy has a tendency to export those goods where its productivity relative to that of its competitors is greater than the ratio of money wages expressed in a common currency.

4 A reader indicated that a similar point about exchange and wage rates was made in a paper by Samuelson (1964). The essence of the argument is indeed similar, yet its implications were subsequently overlooked.
indicated, since 2000 the USA drew on large capital transfers from the rest of the world to finance a vast and increasing trade surplus with China. In the long-run large deficits are unsustainable. In the short-run, they can generate strong pressures for exchange rate adjustment, yet they can have enduring effects on national specialization by setting in motion cumulative processes.

Adjustment can occur in a number of ways. In the first place wages in Portugal could rise, pushing up prices, while those in England fell, until $w^P = 1.11w^E$, and the prices of cloth expressed in the English currency were equal. As indicated in Table 2, the desired result could be achieved by a 5.26% fall in English prices and an equivalent rise in Portuguese prices. In these circumstances, England would be able to export cloth and to earn foreign currency with which it could pay for imports of wine.

The prices in the middle section of Table 2 are the lower limit at which the balance of payments of the two trading countries can be equilibrated. The upper limit occurs at the point at which the prices of wine expressed in the English currency are equal as a result of a fall in relative English wages. A second way in which adjustment could occur and the international flows of money corresponding to international commodity exchange could be equalized is through movements in the rate of exchange. Starting from the same initial position, the rate of exchange would have to move in favour of the Portuguese until it reached at least 1 escudo = £1.11 (i.e. $e = 1.11$) and the prices of cloth were equalized. An upper limit to the depreciation of the pound also exists where the rate of exchange of 1 escudo = £1.50 (i.e. $e = 1.50$) and the prices of English and Portuguese wine would be equal (Table 3). A comparative advantage must therefore be translated into an absolute advantage. It can occur if there are separate currencies, or if regional wage variations can emerge. Adjustment can also occur as a result of factor mobility with increased investment and employment in the area with lower comparative costs (assuming that costs are constant). A third possibility is for surplus areas to transfer financial resources to deficit areas to permit them to consume more than they produce.

This analysis highlights some of the dilemmas of the Eurozone where Germany’s high productivity and declining real wages have generated massive surpluses with peripheral Member States which, in a single monetary space, could no longer resort to devaluation. In recent years these deficits were financed by capital loans that these countries can no longer afford to re-pay. If the Eurozone was also a fiscal union, fiscal transfers might serve as a suitable adjustment mechanism as is the case in most single currency zones. In the EU, however, the EU budget accounts for just 1% of GDP and transfers are limited, as is population mobility, while the adoption of a single currency

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<td>1.00</td>
<td>1.00</td>
<td>1.35</td>
</tr>
<tr>
<td>Wine</td>
<td>1.20</td>
<td>0.80</td>
<td>1.20</td>
<td>0.89</td>
<td>1.20</td>
<td>1.20</td>
</tr>
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Note: Values are expressed in pounds, unless otherwise specified.
closed off the exchange rate flexibility option. In this case adjustment will have to fall on wages as demanded by European institutions, although this option is profoundly deflationary and generates strong resistance as it drives down the living standards of the wage earning class.

The existence or otherwise of gains from trade is a separate matter: it depends on assumptions of constant returns to scale in all production processes, full employment, markets that are flexible and costs of adjustment that are zero. In the presence of diminishing or increasing returns, costs would be affected by changes in the level of output, while the existence of unemployed resources would mean that the opportunity cost of producing the imported good domestically is zero, except as and in so far as production could only occur if materials and capital goods were imported. Ricardo’s example is very deceptive. At that time England had a competitive advantage in manufacturing, and manufacturing was subject to strong increasing returns: free trade was imposed on Portugal, enabling Britain’s industries to grow more quickly and drive down costs, while Portugal stagnated and was made into a deficit country (Sideri, 1970).

Movements in relative money wages or in the rate of exchange, caused by changes in the process of money income formation and the operation of an international monetary constraint, always occur in conjunction with changes in specialization. Each economy is normally capable of producing a range of commodities and the constraint on the money wage ratio should be written

\[ \frac{\text{ships}_E}{\text{ships}_P} < \frac{\text{iron}_E}{\text{iron}_P} < \cdots < \frac{\text{cloth}_E}{\text{cloth}_P} < \frac{\text{wine}_P}{\text{wine}_E} < \cdots < \frac{\text{oil}_E}{\text{oil}_P}. \]

In other words, for a given money wage ratio and rate of exchange, there exists an international division of social production with England exporting a quantity of each of the internationally traded goods to the left of \( \frac{\text{wine}_E}{\text{wine}_P} \), represented by a vector, \( \text{x}_E \), in exchange for imports from Portugal of the other goods, represented by a vector \( \text{x}_P \).

The same industry can appear on both sides of the inequality. In this case, intra-industry trade takes place with a particular pair of countries importing and exporting different varieties of the same good. In addition, the processes of production of many goods are segmented and spread over national and international networks of production sites, with intermediate and semi-finished goods transferred from one place to another for further processing. In this case, exports embody the skills and technologies incorporated in imported inputs. These subdivided processes of production often reflect specialization in different production stages of a final good or service and in different functional roles, with different capital, knowledge and skill intensities. In this case impacts on income depend on variations in net value added and trade associated with occupational specialization. In every industry there is a variety of functional and occupational roles: research and development, product design and engineering, manufacture, marketing, sales, inbound and outbound logistics and administration. The specialization of different places in different functions and occupations within industries is another driver of trade and differential development and is again in part a result of comparative costs. The method of theoretical analysis outlined in this section is in other words applicable to a wide range of situations as long as activities are allocated to different places according to comparative costs.

Suppose next that England has a trade deficit, so that the international monetary constraint is not respected. In other words, \( \text{p}_P^T \text{x}_P > \text{p}_E^T \text{x}_E \), where \( \text{p}_P \) and \( \text{p}_E \) are vectors denoting the prices of production in Portugal and England, respectively. To reduce this deficit in the short-term, wages, the exchange rate or both must fall in England and rise in Portugal. (In the medium term England could increase relative productivity). The
wage ratio expressed in a common currency which links the two national price systems would accordingly be altered moving to the right through the ranked array of comparative costs. As a result, the schema of specialization should change with commodities that were formerly exported by the Portuguese now being exported by the English. Cases of this kind are not rare indicating that trade adjustment can drive long-term changes in specialization.

This analysis must be qualified in several ways. First, any reduction in capacity and development of new spheres of activity involves a scrapping of existing equipment, investment in new activities and a redeployment of workers. As a result, shifts in specialization are neither smooth nor automatic. What is more, only if an industrial system is highly diversified, integrated and resilient can exports be increased and imports diminished without very large variations in the wage ratio or in the exchange rate; and only if a country is capable of remodelling its industrial system and is not dependent on narrow market niches can shifts in specialization occur without serious dislocation. As already indicated, EG provides many concepts for examining these evolutions. What is absent is adequate attention to the causal mechanisms considered in this analysis.

Another difficulty concerns the effects and efficiency of monetary mechanisms. Ricardo held that the mechanism through which adjustment would occur was the one posited in the classical quantity theory of money (see Shaikh, 1979, 281–302, 1980, 27–57). On this account net transfers of gold, at first from England to Portugal, would be translated into movements in money price levels in the two nations (relative prices were deemed to be determined by real factors, and money was only introduced in order to determine the general price level). Whether or not monetary expansion and contraction have a direct effect on the price level has been a subject of dispute in economics. According to Marx and Keynes, for example, changes in the supply of money have a direct effect only on the rate of interest: a fall in the supply of money results in an increase in the rate of interest raising, incidentally, the costs of borrowing and impeding the new investment necessary for adjustment and vice-versa.

In monopolistic circumstances, wages and other costs are characterized by a degree of inflexibility. Confronted, say, with a fall in the exchange rate, employers may decide against a downward adjustment in prices expressed in a foreign currency. In this case the competitiveness of the enterprise’s output would remain the same, and its profit margins on export markets would increase. Adjustment in this case may well fall on output instead of on prices. Adjustment is neither automatic, nor self-equilibrating at full-employment levels of resource use (see Edwards, 1985, 123–37).

In this section, we have in short identified a number of vital mechanisms of international and regional adjustment: exchange rates, wage rates and international monetary constraints that will bind in the absence of capital movements. In addition, a method of theoretical analysis was used in order to identify and describe the interaction of some of the major drivers (summarized in Figure 3) of the evolution of the rate of exchange and of the international division of labour depend. The historical process itself can however only be explained if this theory is elaborated further and is supplemented by empirical analysis.

This argument can be developed in a variety of ways. In particular, it can be extended to include a macroeconomic account of the dynamic interaction of the schema of specialization represented by the vectors $x^E$, $x^P$ and the conditions $A$, $f$, $w$ and $r$, and of what Myrdal and Kaldor first called processes of circular and cumulative causation.
(see Myrdal, 1957, 11–22; Kaldor, 1970, 340–344, 1972, 1244–1245). Models of circular and cumulative causation along with an analysis of the underlying mechanisms of value formation are core elements of explanations of uneven development: whereas raw material and land-based activities depend on natural resource endowments, processing activities depend on resource endowments and markets that are endogenous results of development. These models highlight the importance of other drivers of regional growth: the evolution of demand from the export sector and residential economy, investment and movements of factors of production. Kaldor showed that the demand for an area’s exports plays an especially important role in inducing new investment (raising output and perhaps employment), which in processing sectors is associated with increasing returns that drive up productivity and reduce efficiency wages. Exports in turn depend on the growth in demand for a region’s products, and on the efficiency wage relative to other areas, generating potentially virtuous and vicious spirals.5

The mechanisms highlighted in this model are concerned only with the movement of economic aggregates and with very broad sectors of activity identified in standard national and regional social accounts. Yet, transactions within sectors and especially within the industrial sector/account are particularly important.

### 6. A new geography of trade and regional development

In this article we have emphasized the continuing importance of models and concepts developed in regional economics and earlier geographical traditions and the need for a synthesis of these ideas with analyses of institutionally shaped and mediated resource endowments and productive systems. In Sections 2 and 4, we emphasized the role in regional economic evolution not just of the production account but also of the appropriation, accumulation and external accounts. In a world of increased international trade and competition, analysis of the external account and its drivers are particularly important embracing a regional economy’s and its component enterprises’ competitive advantage including their capacity to export and compete with imports from other currency zones.

In Section 3, we presented a conceptual framework that embraced trade-related wage and exchange rate adjustment and capital flows and in Section 5, we presented a

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5 A formal representation of this model (Dixon and Thirlwall, 1975) is as follows:

\[
\dot{r}_t = \dot{r}_a + \lambda (\dot{q}_t) \\
\dot{p}^d_t = \dot{w}_t + \dot{r}_t - \dot{r}_t \\
\dot{e}_t = \eta (\dot{p}^d_t) + \varepsilon (\dot{y}^*_t) + \delta (\dot{p}^*_t) \\
\dot{q}_t = \gamma (\dot{e}_t)
\]

where \( \dot{r} \) = rate of productivity growth, \( \dot{r}_a \) = rate of autonomous productivity growth, \( \lambda = \) Verdoorn coefficient, \( \dot{q} \) = rate of productivity growth, \( \dot{p}^d \) = rate of domestic inflation, \( \dot{w} \) = rate of growth of money wages, \( \dot{r} \) = rate of growth of 1+\( x \) percent mark-up on unit labour costs, \( \dot{e} \) = rate of growth of exports, \( \eta \) = price elasticity of demand for exports, \( \varepsilon \) = income elasticity of demand for exports, \( \dot{y}^*_t \) = rate of growth of world income, \( \delta \) = cross-elasticity of demand for exports, \( \dot{p}^*_t \) = rate of growth of world prices and \( \gamma \) = a constant.
reformulation of the principle of comparative advantage. Among other things, the aim of these sections was to emphasize the importance for economic geography of economic calculation and analytical reasoning. Economic calculation and analytical ideas are important features of classical and neoclassical location theories. Consideration of institutional and sociological contexts, rules and drivers add rich new insights. These approaches should however add new dimensions of analysis rather than replace economic calculation.

Analytically, the starting point was the advance of money, incomes and demand. Money and credit initiate and drive economic activity: decisions to advance credit and money wages and to acquire working and fixed capital create income, whereas income is a source of effective demand and drives capital accumulation and growth. Once produced, goods and services are offered for sale in the market place at prices of production. The determinants of these prices are complex and are not confined to economic considerations: relative power and strategic choice play a role. If these goods and services are sold, income is earned, and, if prices are high enough, costs are recovered. These revenues provide capital incomes and money capital that can re-start a circuit whose size and character can change over time as enterprises seek to innovate and grow and to compete with their domestic and international rivals. In short, capital expenditure, credit and investment subsidies (accumulation account) and the creation of markets (production and income accounts) are crucial drivers of industrial dynamics. What happens in the long run is a result of a succession of decisions with varying time horizons. These decisions are made in the light of current conditions and expectations about how they will evolve. Their effects however are cumulative, and in some cases the decisions made are profound and radical. As a result, these decisions can have enduring effects on the evolution of economic landscapes.

At any point in time the activities in a particular area are associated with a structure of specialization and a set of comparative costs/prices. Competitive success depends on the establishment of an absolute advantage. If areas have different wages and/or different currencies, what initially are only comparative advantages can be translated into absolute advantages. Other adjustment mechanisms do exist: included are the mobility of capital and labour and money transfers or loans that permit areas that are relatively uncompetitive to import more than they export. Fiscal transfers are particularly important within national economies and in many single currency zones though not in the EURO zone. In the short-term, deficits can be financed by international credit, although credit is often awarded conditionally and rivals who accumulate large Sovereign Wealth Funds also increase their capacity to acquire assets and resources. In the absence of sustained transfers, a monetary constraint will ultimately come into effect.

The polarization of surpluses and deficits (Figure 1) is a result of shifts in relative competitiveness between different monetary spaces and the weakness of the inter-area monetary constraint (the developed countries with deficits and the emerging manufacturing economies and oil producing countries with surpluses) and between different parts of a single economic space (German surpluses and the deficits of peripheral European countries that relied for so long on falling exchange rates to keep deficits in check and whose recourse to credit provoked a debt crisis). These outcomes have had a profound set of effects on comparative regional dynamics whether through the impact of deleverage and recession on growth, or the impact of rising wage costs and rising exchange rates in emerging economies that see significant intra- and inter-
national industrial transfers and in some cases permit the return of activities formerly
off shored from high income countries.

Adjustment mechanisms in the shape of currency exchange rates and capital mobility
are crucial for the understanding of relationships between international trade, regional
resources and assets, the long-term competitiveness of industries and regional
development. The geographical evolution of markets and underlying trends in
income and credit play major roles in the growth, contraction and relative development
of regional economies shaping the regionally embedded and path-dependent processes
examined in relational and evolutionary EG.

As indicated in Section 2, the importance of major monetary mechanisms, especially
money wage costs, exchange rates and currency and capital flows in shaping industrial
competitiveness and specialization is clearly illustrated by the impact of EURO zone
imbalances, the Asian financial crisis and the appreciation of Japanese Yen (especially
against the USD) after the Plaza Accord. In the latter case, in 1985, the G5 (US, UK,
France, West Germany and Japan) agreed on co-ordinated currency market action to
depreciate the US dollar relative to the Japanese Yen and German Deutsche Mark
(Figure 2). The aim was to assist US recovery from the early 1980s’ recession and reduce
current account deficits. As a result in 1985 to 1987, the US dollar depreciated by 51%
against the Yen (Figure 2; Funabashi, 1988). The appreciation of the Yen depressed
Japan’s export-oriented manufacturing industries and opened the way to a series of
expansionary monetary policies. These policies contributed to Japan’s late 1980s asset
price bubble (Destler and Henning, 1989) and the 1990s’ recession (the so-called Lost
Decade), partly because of a liquidity trap that rendered these policies ineffective in
stimulating economic growth when interest rates were very low (see Krugman, 2009). In
this case changes in real effective exchange rates and subsequent impacts on capital
flows and real wage costs interacted with (local) factor endowments and formal and
informal institutions to modify the long-term competitiveness and structure of Japanese
industries.

The mechanisms involved in the creation of resource endowments and the
determination of efficiency wages, values and flows of money and capital are steps
that are not considered in any detail in this article. EG and GA deal with the first of
these steps. GE does deal with costs and profits but does not adequately deal with real
and monetary adjustment mechanisms in a disequilibrium framework or with the
monetary outcomes and imbalances associated with changes in trade surpluses and
deficits, movements in exchange rates, capital flows and associated changes in income.
What is involved is examination of the reciprocal relationships between micro-conduct
and the overall performance of regional economies: real and monetary adjustment
mechanisms drive in important ways the capacities and capabilities of regional
economies and movements up or down the value-chain are a response not just to
supply-side but also to demand-side, monetary and payments-related factors.

Funding

This research was supported by an ESRC grant (RES-062-23-1600) and by an NUS
FRC-Tier 1 Grant (R-109-000-084-112) for a project entitled Economic Inter-
dependence and Comparative Regional Dynamics in Developed and Developing
Economies: Trade and Regional Trajectories in China and the EU, by a Chinese
Academy of Sciences Visiting Professorship for Senior International Scientists Grant 2009S1-44, by National Natural Sciences Foundation of China award no. 41125005, 41071096 and 41201116 and by National Project 973: 2012CB95570002.

Acknowledgements

The authors would like to express their appreciation of the detailed comments from two referees and an editor and especially of the detailed suggestions one referee made concerning the re-organization of initial drafts.

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