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The informal sector: a source of growth

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Content

1. Introduction[1]

China does not cease to amaze. Since the late seventies the Chinese economy has grown at a rate of more than 9% per annum, and, even though the financial crisis in Asia may slow down growth temporarily, the economy is expected to expand at a more or less similar pace in the coming years. This high growth rate is certainly not a school example of the successes that market-based development policies may deliver. China has partially reformed the economy since the late seventies, but still it faces at least one major reform: to privatise the state-owned enterprises. It is still in between a plan and a market economy. Sachs and Woo (1997) therefore lean towards the idea that the initial conditions should be part of any explanation for China's success. China started as an agrarian economy, in which the large majority of the population was employed in agriculture. The reforms in 1978 and after changed this. Agriculture grew several years at a rapid pace, allowing a massive reallocation of labour towards rural industries, further boosting economic growth. The World Bank (1996) corroborates this story, and attributes at least one percentage point extra growth per annum to labour reallocation. Sachs and Woo go one step further by claiming that China fits the typical East-Asian pattern of development. High saving rates, prudent fiscal policies that stimulate or at least do not frustrate private savings, and a 'high proportion of the population in agriculture or other low-wage activities' are important elements in the East-Asian success story. Also Young (1993, 1994) emphasizes sectoral transfers of labour, but in addition attributes the high growth rates in parts of Asia to rising participation rates. More generally, in his view rapid economic growth in Asia is not a miracle of technology, but explained by rapid growth of the capital stock and the labour force.

Sachs and Woo emphasize that in East Asia reallocating labour from agricultural low-wage activities to industrial high-productivity jobs is an important engine of growth. The idea is familiar and probably originates from Lewis (1958). It is still relevant, not only for East Asia however. In Africa, in other parts of Asia and perhaps less so in Latin America many economies are still predominantly agrarian or at least a large part of the labour supply engaged in low-productive activities.

This paper tries to assess quantitatively the consequences of reallocating labour from traditional, low-productive towards modern, high-productive activities – not only for developing countries but also for developed countries. To this end we use WorldScan, a global applied general equilibrium model. It formally captures the main elements of Lewis' analysis from 1958. He distinguishes two sectors. The first one is a traditional subsistence sector, in which the marginal productivity of a worker is (close to) zero. The

[1] The authors gratefully acknowledge comments by Casper van Ewijk, George Gelauff en Hans Timmer.

second one is a modern capitalist sector, in which technology, capital and labour are combined efficiently. The latter sector grows through the accumulation of capital and technical progress, and demands more and more labour which it must attract from the first sector. WorldScan makes a similar distinction. Workers in developing countries are engaged either in modern high-productive activities or in informal low-productive activities. This allows us to conduct an experiment to establish the macroeconomic impact of reallocation. Basically, we have run two simulations. In the first simulation developing countries grow as a consequence of technical change and capital accumulation. The productivity in traditional and modern sectors develops at a different rate, increasing the wage difference between traditional and modern activities and inducing reallocation of workers from the former to the latter. In the second simulation the labour allocation between low- and high-productive activities is frozen.

The experiment ignores the micro-economics of migration, employment and wages. It does not ask why productivity differences arise, but simply assumes these differences exist and continue to exist. In Agenor and Aizenman (1998) the labour market is segmented as a result of efficiency considerations and minimum wage laws. Banerjee and Newman (1998) study also reasons for the dichotomy between traditional and modern sectors. They claim that the productivity is not the only difference, and assume that in traditional sectors information asymmetry is less a problem and access to financial credit is better than in modern sectors. Not everyone is willing to give up access to financial funds in bad times for a higher income. This seems to entail the view that better availability of financial credit and capital, leading to falling interest rates, feeds the process of growth and modernisation.

Bypassing microeconomic explanations for the dichotomy between traditional and modern sectors and thus ignoring perhaps important changes at the level of individuals and communities, the experiment is only concerned with the macroeconomic and global consequences of labour reallocation. It allows us to trace the effects on growth, specialization patterns and the relative position of low-skilled and high-skilled workers in developing as well as in developed countries. For the macroeconomics of labour reallocation we need two basic ingredients: the number of low-productive and high-productive workers and the productivity difference between them. Data from the ILO are the basis for estimating the number of low- and high-productive workers at the start of the simulation period. The other element cannot be determined with great precision, and will prominently feature in a sensitivity analysis.

The simulations with the model are embedded in a scenario. This so-called High Growth scenario aims to show the linkages between the OECD countries on the one hand and emerging economies on the other hand (see OECD, 1997). For that reason it assumes high growth in many developing countries and almost complete trade liberalisation, so that during the scenario period, 1995-2020, the linkages intensify and the impact of emerging economies on the OECD countries is allowed to be potentially large. Only in the High Growth scenario reallocation in developing countries may conceivably affect developed countries, and a different scenario in which the OECD

region is more or less a closed economy and untouched by developments elsewhere, seems less interesting for our purpose.

The simulations reveal that labour allocation is potentially an important source of growth. This conclusion applies in particular to Asia or at least to some countries in Asia, namely China, India and Indonesia. The flux towards modern, high-productivity sectors may yield up to one percentage point extra (productivity) growth each year during the scenario period of 25 years. Developing countries not only grow faster, but also experience important changes in production and specialization patterns. Workers engaged in low-productivity activities are predominantly low-skilled. The extra supply of low-skilled workers through reallocation – in efficiency units – boosts production of sectors that intensively employ this type of workers. Developing countries thus specialize more in skill-*ex*tensive production, and developed countries will be forced to specialize more in skill-*in*tensive production. Since the supply of low-skilled workers increases, the relative wage of these, high-productive but low-skilled workers will fall in developing countries, but also in developed countries.

Finally, this paper illustrates that the distinction between low- and high-productive activities is crucial when modelling developing countries or when projecting the future state of affairs for these countries. Simulations show that productivity growth in the modern part of agriculture has larger effects than productivity growth in for example manufacturing. Here, we refine the original analysis of Lewis. He emphasizes that productivity growth in the modern sector will 'pull' labour from the traditional sector. However, China illustrates that booming rural industries are not necessarily the driving force behind labour reallocation. Instead, in China the industrial revolution has started -- paradoxically -- in agriculture. Reforms and productivity growth in agriculture has the effect to 'push' labour towards the modern industrial sectors. If modern production methods in agriculture are introduced or become more efficient, prices of agricultural products will fall, lowering the rewards for land and labour in traditional agriculture, increasing the wage difference between modern and traditional sectors and pushing labour towards modern (industrial) sectors. In WorldScan the 'push'-effect is stronger than the 'pull'-effect, suggesting that technical change in agriculture is an essential condition for a developing country to grow fast.

Section 2 explains how the distinction between traditional, low-productive and modern, high-productive sectors is introduced in the model and how it relates to the data. The next section introduces the main characteristics of the model and very briefly discusses the High Growth scenario. Then, in section 4, the results of the two simulations will be presented, showing the consequences of elastic labour supply in developing countries for growth, trade and wages. Section 5 deals with the impact of productivity growth in agriculture and manufacturing. Section 6 gives the main conclusions.

2. The informal, low-productivity sectors in WorldScan

WorldScan, a global general equilibrium model, formally captures the main elements of Lewis' analysis from 1958. He distinguishes two sectors. The first one is a traditional subsistence sector. The marginal productivity of workers is in this sector (close to) zero. They work on the land or provide simple services in cities. These workers do not have access to capital and modern technologies, or lack the skill to work with these. The second one is a modern capitalist sector, in which technology, capital and labour are combined efficiently. The latter sector grows through the accumulation of capital and technical progress, and demands more and more labour from the first sector. WorldScan makes a similar distinction. Workers in developing countries are engaged either in modern high-productivity activities or in informal low-productivity activities. These two activities have not only a different level of labour productivity but also different production functions. The high-productivity activities combine intermediate goods, (two types of) labour, capital and technology whereas the low-productivity activities only require raw labour.

This section aims to clarify how the distinction between low-productivity and high-productivity activities is introduced into the WorldScan model.[2] It starts with discussing two modifications to Lewis' original analysis. Then it looks at available data to characterize the process of growth and development as well as to calibrate the model.

Two aspects of Lewis' analysis are somewhat crude. One aspect concerns the distinction between 'push' and 'pull' factors behind labour reallocation. we will deal with this later on. The other aspect is his assumption of completely elastic labour supply, originating from the traditional sector. This a rather drastic assumption. Nonetheless, it seems reasonable that labour allocation between the traditional, low-productivity sector and the modern, high-productivity sector depends on the wage difference between these two sectors. For example, Peng, Zucker and Darby (1997) find for Chinese regions that employment in rural industries is lower the higher the land-labour ratio is. This underscores that the productivity difference between agriculture and manufacturing affects the allocation of workers across the two sectors.

In WorldScan the wage elasticity of labour supply is finite. More precisely, the model postulates a wage-setting or labour-supply function, linking the wage difference between traditional and modern sectors to low-productivity employment,

[2] When making a distinction between the two activities, we will use various terms interchangeably: formal and informal, modern and traditional, high-productivity and low-productivity.

$$0 < l = 1 - \left(\frac{\overline{w}}{\underline{w}} \frac{1}{C} \right)^{\gamma} < 1, \quad \gamma > 0 \tag{1}$$

where l is the share of low-productivity workers in the total labour supply, $\overline{w}$ and $\underline{w}$ is (wage) income earned with high-productivity and low-productivity activities respectively, and C is a parameter and equals the maximum wage ratio.[3] When the wage ratio reaches its maximum and l approaches zero, the relation between the wage differential and employment in the traditional sectors breaks down. The labour market will clear such that total labour supply equals total demand in the high-productivity sectors. Later we will see that employment in low-productivity sectors can be as high as 60% of the labour force and that an informed guess of the ratio of high to low wages is about 4.

Clearly, this formulation ignores the micro-economics of reallocation, migration and wage formation. It does not ask why productivity differences arise, but simply assumes these differences exist and continue to exist. Productivity in traditional and modern sectors develops at a different rate, increasing the wage difference and inducing labour reallocation between these sectors. The extent to which wage differences induce a flow from low-productivity to high-productivity sectors depends crucially on wage elasticity of labour supply, relevant for the modern sectors. In equation (1) this elasticity is equal to γ. In the simulations this wage elasticity has been set at two, γ=2.

A second aspect we choose to refine has to do with the distinction between 'push' and 'pull'. Lewis emphasizes that productivity growth in the modern sector will 'pull' labour from the traditional sector. However, China illustrates that booming rural industries are not necessarily the driving force behind labour reallocation. Instead, in China the industrial revolution has started in agriculture. Reforms and productivity growth in agriculture has the effect to 'push' labour towards the modern industrial sectors. Therefore, WorldScan assumes that in 'Agriculture' and 'Services' both traditional and modern methods of production are used. The goods produced by traditional and modern methods are perfect substitutes. If the modern methods in 'Agriculture' become more efficient, prices of agricultural products will fall, lowering the rewards for land and labour in traditional agriculture, increasing the wage difference between modern and traditional sectors and pushing labour towards the modern (industrial) sectors. The wage difference will also increase if technical change or capital accumulation increases productivity in other sectors than 'Agriculture' and 'Services'. Workers are then pulled, instead of pushed, towards the modern sectors.

[3] Strictly speaking workers in informal sectors do not earn wages, but very often we refer to income earned by these workers as wage.

In the model the price of low-productivity output is a weighted sum of the price of 'Agriculture' and 'Services', as if low-productivity workers are employed partly in 'Agriculture' and partly in 'Services'. The weights are region-specific. Besides, these weights do not change over time, since we do not want to focus on reallocation between low-productivity activities or, more to the point, migration from backward rural areas to slumps in cities. Specifically, the low wage equals

$$\underline{w} = \left(\sum_i s_i p_i \right) A \, , \; \sum_i s_i = 1 \, , \tag{2}$$

where s_i is the number of low-productivity workers in sector i as a fraction of the total number, p_i denotes the producer price in sector i and A is a time-varying index for technology.

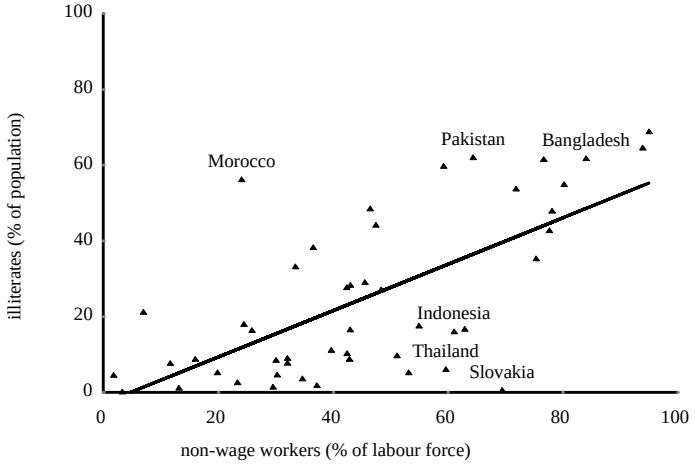
To summarize, within a fairly standard AGE-model we make a distinction between high-productivity and low-productivity activities. After introducing this distinction the model endogenously determines the number of low-productivity workers, l in equation (1), and the wage they earn, $\underline{w}$ in equation (2). The other endogenous variables, the wage of high-productivity workers $\overline{w}$ and the output prices p_i, are determined elsewhere in the model.

Now we turn to the more difficult task of changing symbols into numbers in order to make a quantitative, macro-economic assessment of the informal activities in the process of development and growth. Specifically, we want to quantify three aspects of the theoretical approach: employment in informal sectors, the productivity difference between formal and informal sectors and the annual pace at which workers shift from informal to formal sectors. The main sources are the International Labour Organisation (1998) and the World Bank (1995, Table A.3.1). These institutes give for numerous countries the share of non-wage workers in the total active population according to the sector they work: agriculture, manufacturing and services. The share of non-wage workers in developing countries exceeds by far the share in developed countries. In the beginning of the 90's the share was 84% in China, 75% in India and 39% in Indonesia, whereas in the United States the share was less than 10%. The number of non-wage workers -- employers, own-account workers but also unpaid family members -- is taken to be an indication for employment in informal sectors. From the data we also derive the allocation of low-productivity workers across agriculture and services. We thus determine on basis of these data l and s in the two equations. The raw data have been

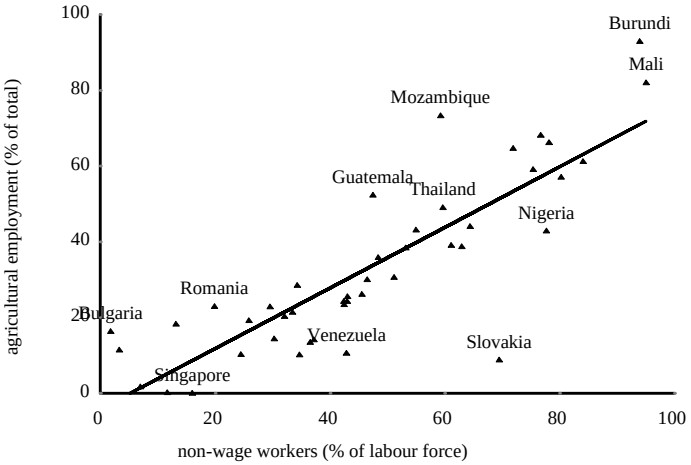
adjusted for a natural share of non-wage workers. The 'natural' share is set equal to the average value for the OECD.[4]

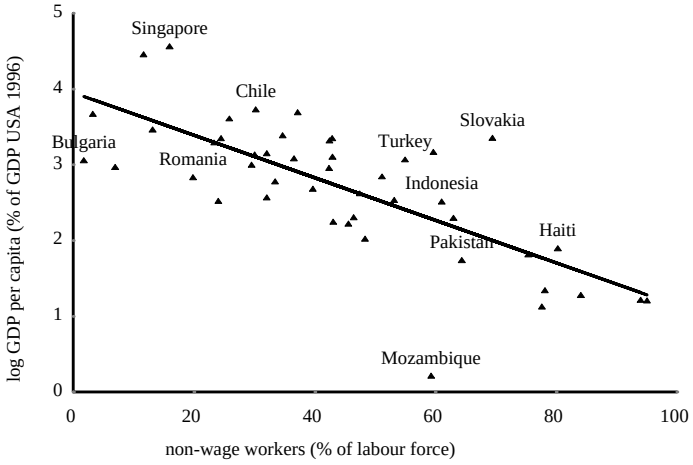
The number of non-wage workers is a rough, macro-economic proxy for informal, low-productivity employment. Charmes (1990) has followed this route before. It is appropriate in at least one view on the informal sector. According to this view informal activities are an adequate response to inadequate economic institutions, forcing workers to create employment themselves, see among others ILO (1992). The number of non-wage workers is a good approximation for informal employment. It is at the very least a good indicator for the level of economic development. Figure 2.1 plots for various developing countries the share of non-wage workers in the total labour force against three other development indicators: in the upper panel the share of agriculture in total employment, in the middle panel the number of illiterates as percentage of the total population and in the lower panel the logarithm of GDP per capita (as percentage of the GDP per capita in the United States in 1996). Clearly, there is a close relation among the four development indicators. A developing country where income per capita is low, is likely to have many non-wage workers, considerable employment in agriculture and a high illiteracy rate.

Figure 2.1 Non-wage workers and other development indicators



[4] Hof et al. (1998) provide more details.





The close relation among the various development indicators tells that different indicators will not give drastically different answers. Reallocation of workers from low-productivity to high-productivity activities is only a potentially important source of growth if the pool of (informal) workers is large. The data on non-wage workers help us to identify those countries or regions that have a large pool and that can grow fast through reallocation. Looking at a different measure or using a different data source is not likely to change the outcome significantly.

To characterise the traditional sectors and their impact on the performance of developing countries we need to make assumptions about the productivity or wage difference $\left(\overline{w}/\underline{w}\right)$ throughout a scenario period. Lacking an estimate for the productivity or wage difference between formal and informal activities we have to rely on casual observations on this matter and even more on sensitivity analysis. The ratio of the high wage and the low wage, $\overline{w}/\underline{w}$, is set equal to 4 at the beginning of the scenario period when the share of traditional sectors in employment is 0.65. This implies that the maximum wage ratio, *C* in equation (1), is set equal to 6.75. The development of relative wages over time is chosen is such a way that equation (1) leads to a flow of workers into the formal sector that is roughly in concurrence with historical patterns.[5]

Table 2.1 Employment in agriculture
% of total employment

	1960	1990	average annual change
China	83.2	72.2	-0.4
India	75.4	64.0	-0.4
Indonesia	74.8	55.2	-0.7
Brasil	55.2	23.3	-1.1
Russia	30.4	13.7	-0.6
Korea	61.3	18.1	-1.4
Slovenia	63.8	5.7	-1.9
Japan	33.1	7.3	-0.9
Western Europe	16.7	4.7	-0.4
United States	6.6	2.8	-0.1

Source: ILO (1996)

Table 2.1 presents for various regions the share of agriculture in total employment in 1960 and in 1990.[6] The table shows that some countries have experienced a considerable

[5]The development of relative wages is influenced by assuming autonomous technological progress in the low-productivity sector.

[6] Data for the number of non-wage workers are not readily available, let alone for more than year. Therefore we consider the changes over time in agricultural employment.

fall in agricultural employment during this period of thirty years. The pace at which changes have taken place, is sometimes breath-taking. Typically, the countries that have gone through a process of rapid structural change, have also started to catch-up with the group of rich countries. However, also in Brasil, where growth has been much less spectacular than in Korea or Japan, changes in sectoral structure have been quite pronounced. Table 2.1 also shows that in some countries changes have only just begun. In the Asian countries -- China, India and Indonesia -- the share of agricultural employment is 50% or more, and even in Brasil and Russia the share of agriculture is still large by western standards.

The data underlying Figure 2.1 can also demonstrate the relation between informal activities and the stage of economic development. A simple regression shows that the share of non-wage workers falls almost 1 percentage point when GDP per capita increase with 5 percent.

non-wage workers =		7.3	- 19.5 ln (GDP per capita)
% of labour force		(6.1)	(3.2)
Adjusted R^2	0.537		
Observations	46		

(White's heteroskedasticity-consistent standard error between parentheses)

The regression equation does not imply anything about causality. In the theoretical analysis the causality runs both ways: from less low-productivity workers to higher productivity (mainly in agriculture) and from higher productivity to less low-productivity workers. Another implication of the theoretical analysis is that average labour productivity in agriculture is relatively higher at a later stage of development. Since low-productivity workers are employed mainly in agriculture, especially average productivity in agriculture is boosted when these workers shift from low-productivity to high-productivity activities.

The pace of reallocation in the High Growth scenario is roughly in line with the above regression result. The flow of workers from traditional to modern sectors is not the same in very region but rather depends on the projected growth of GDP per capita. To be more precise, we have employed an equation that is similar to the regression equation. The main difference is the coefficient for logarithm of GDP per capita. Whereas the regression yields a coefficient of 19.5, we have chosen for a more moderate pace of allocation and for a coefficient of 15. For example, China grows in the scenario at a per capita rate of 7.5% and sees its income per capita more than quadruple. In concurrence with this high growth rate China it is projected to see about 1 percentage point of the

labour force shift from traditional to modern sectors. This adds up to 28 percentage points during the scenario period. In other regions the pace of reallocation is slower. In the rest of Asia the shift amounts on average to 20 percentage points.

The various historical realisations shown in Table 2.1 make these projected shifts seem adequate and sometimes even modest. Still, at the end of section 4 we will present various simulations showing the sensitivity of the outcome for the assumptions about the productivity difference and the pace of reallocation. Employment in traditional and modern sectors is based on data about non-wage (and wage) earners, as has been discussed at the beginning of this subsection. It does not seem to require sensitivity analysis.

Table 2.2 Low-productivity sectors in developing countries
value added, employment and GDP per capita in 1995

	Latin America	Middle East	Sub-Saharan Africa	China	South-East Asia	South-Asia & Rest
informal sector	1.9	1.5	8.2	19.0	4.3	14.1
% of total value added						
informal employment	25.2	23.8	60.0	63.4	37.7	61.9
% of total low-skilled workers						
informal agrarian employment	39.4	50.6	68.8	85.6	55.1	80.1
% of total informal employment						
ratio of high and low wages	5.8	5.9	4.2	4.0	5.3	4.1
GDP per capita ($1000)	3.4	2.4	0.5	0.7	2.9	0.5

Source: own calculations, based on McDougall et al. (1998), World Bank (1995) and ILO (1998)

So far we have tried to quantify several aspects of the theoretical analysis separately. At the end of this subsection the various aspects are brought together. Table 2.2 gives the resulting characteristics of the low-productivity sectors in the starting year 1995.[7] Not

[7] WorldScan makes a distinction between low-skilled and high-skilled workers (see also section 3). We assume that high-skilled workers do not engage in traditional activities and that only low-skilled workers are stuck in low-productive sectors.

surprisingly, in Asia and also in Africa informal employment is high whereas in Latin America it has already fallen to relatively low values.[8]

3. WorldScan: a global applied general equilibrium model

WorldScan has been developed to analyse long-term developments in the global economy. The model relies on the neoclassical theories of growth and international trade. Changes in economic growth and international specialisation patterns evolve from changes in (relative) endowments. The emphasis on the long run also manifests itself in the broad definition of sectors. WorldScan distinguishes 7 sectors. This is a relatively small number compared to other AGE models. Over a long period of two decades or more the character of products and branches of industry change drastically. Current statistical definitions of products and branches of industry are likely to become irrelevant at the end of scenario period. For this reason, WorldScan uses broad aggregates.

The standard neoclassical theory of growth distinguishes three factors to explain changes in production: physical capital, labour, and technology. WorldScan augments the simple growth model in three ways. First, WorldScan allows overall technology to differ across countries. It also takes up the related idea that developing countries can catch up quickly by adopting foreign state-of-the-art technologies. Second, the model distinguishes two types of labour: high-skilled and low-skilled labour. Sectors differ according to the intensity with which they use high-skilled and low-skilled labour. Countries can raise per capita growth by schooling and training the labour force. Third, in developing countries part of the labour force works in low-productivity sectors. In these sectors workers do not have access to capital and technology. Reallocation of labour from the low-productivity sectors to the high-productivity sectors enables countries to raise per capita growth as well. (The previous section gives a more detailed explanation of the distinction between low- and high-productive sectors in WorldScan.) In principle, all these three factors affect the performance of a region only temporarily.

[8] Note that the two measures for the size of the traditional sectors (value added and employment) give a somewhat different impression. They rank the regions similarly, but gauge the differences between these regions differently. For example, China and India seem similar in terms of employment, but different in terms of value added, though both measures indicate that the traditional sectors in China are larger than in India. The reason is found in the supply of high-skilled workers. If high-skilled workers are relatively abundant and low-skilled workers are relatively scarce, the wages of the latter workers are relatively high. For a given wage difference between traditional and modern sectors, wages in the traditional sectors are also relatively high.

Box 1 WorldScan, a global general equilibrium model

At the heart of WorldScan are the neoclassical theories of economic growth and international trade. The core of the model is extended to add realism to scenarios. In doing so, we aim at bridging the gap between academic and policy discussions. The extensions include:

- an Armington trade specification, explaining two-way trade and allowing market power to determine trade patterns in the medium run, while allowing Heckscher-Ohlin mechanisms in the long run;
- imperfect financial capital mobility;
- consumption patterns depending upon per capita income, and developing towards a universal pattern;
- a Lewis-type low-productivity sector in developing regions, from which the high-productivity economy can draw labour, enabling high growth for a long period.

The model distinguishes the following regions, sectors and productive factors (see appendix A for a detailed, regional and sectoral classification):

Regions	*Sectors*	*Productive factors*
United States	Agriculture	*Primary inputs*
Western Europe	Raw Materials & Energy	Low-skilled labour
Japan	Capital Goods	High-skilled labour
Rest of the OECD	Consumer Goods	Capital
Eastern Europe	Intermediate goods	(fixed factor)
Former Soviet Union	Domestic Services	
Middle East and North Africa	Trade and Transport	*Intermediate inputs*
Sub-Saharan Africa		all sectors
Latin America		
China		
South-East Asia		
South Asia & Rest		

Catching-up, training of low-skilled workers and reallocating labour to the high-productivity sector do not raise the growth rate indefinitely. Nevertheless, they are important. Adjustments in the economies of developing regions take a great deal of time and will surely show up in the growth rates of these regions in the period under consideration.

Education and reallocation of workers not only explain the performance of developing countries, but also affect trade patterns. Workers in the informal, low-productivity sector are predominantly low-skilled. When more workers find employment in the high-productivity sectors, the (relative) wage of low-skilled workers falls and mainly sectors that intensively employ low-skilled workers expand. Obviously, education has an opposite effect. Either effect can dominate. In some developing countries wages of low-skilled workers lag behind the wage of high-skilled workers, whereas in other regions the skill premium decreases.

Sectors in WorldScan have different factor requirements. For a given sector these factor requirements are more or less similar across regions. This means that if a sector is relatively capital intensive in one region, it is also likely to be relatively capital intensive in other regions. Sectoral restructuring can easily be linked to changes in relative endowments and changes in (region-specific) demand patterns. This also holds because in WorldScan substitution elasticities between domestic and foreign goods are believed to be high in the long run, at least much higher than in the short run.

Data

WorldScan has been calibrated on the GTAP database, see McDougall et al. (1998). The calibration year is 1995. From this data set we derive not only demand, production and trade patterns, but also labour and capital intensity of the various sectors. The sectoral classification according to skill intensity is broadly correct, but the precise differences could very well change, when better data become available. The data for the supply of low-skilled and high-skilled workers at a regional level have been taken from Ahuja and Filmer (1995). Workers are labelled high-skilled when they have attained secondary education or higher. Ahuja and Filmer provide projections for many developing countries. We lack projections for the OECD, Eastern Europe and the Former Soviet Union. Therefore we use the Barro and Lee (1996) data on education to derive a trend between OECD and non-OECD regions between 1960 and 1990.

Substitution elasticities

The results of the model depend on substitution possibilities in production and consumption. Production technology is described by a nested CES function. The upper level distinguishes between value added and intermediate goods. The substitution elasticity between these two broad categories is 0.8. At the lower level value added is

described by Cobb-Douglas function of the primary productive factors -- capital, low-skilled labour and high-skilled labour -- whereas intermediate goods are combined according to a CES function with again a substitution elasticity of 0.8. The utility function, from which demand for different consumption categories is derived, has been given a Cobb-Douglas specification. The substitution elasticity between any pair of consumption categories is therefore unity.

Traded, foreign goods are not perfect substitutes for domestic goods, and this also affects the outcome of simulations. The substitution between goods from different origins is not perfect. WorldScan employs an Armington-type assumption. However, the price elasticities of demand considerably increase over time, and depend on the market share. When the market share is virtually nil, the elasticity is highest and equal to the substitution elasticity between goods of different origin, and when the market share is unity, the elasticity equals the price elasticity of *total* demand (one). The model employs different assumptions for raw materials, agriculture, manufacturing and services. The long-run substitution elasticities in the benchmark case are 17, 13, 7 and 5, respectively.

The High Growth scenario: main characteristics and trends

The simulations in section 4 are permutations of a scenario. They are not necessarily independent of the characteristics of this scenario. Therefore we discuss the main characteristics briefly.

The so-called High Growth scenario (OECD, 1997) aims to explore the linkages between OECD and non-OECD economies in the near and distant future. It is not necessarily the most plausible or the most realistic one. In fact, it depicts a rather optimistic picture of the years to come, at least so far as developing countries are concerned. The idea is that when developing countries grow fast or start to grow rapidly, the linkages between the OECD and the non-OECD countries intensify. Fast development outside the OECD area and complete liberalisation of goods and capital markets produce closer economic integration of rich and poor countries. More generally, the scenario extrapolates and probably exaggerates the current globalisation tendencies.

To attain and sustain high growth rates developing countries should pursue sound domestic policies. Countries that do not create favourable conditions for market-based development, are likely to fail. For example, developing economies must open up to allow foreign goods and foreign investment. In the scenario, trade liberalisation is not confined to trade blocs, but applies globally. The OECD countries open up their markets further. Whereas barriers to trade in manufacturing goods are already low, agriculture is still heavily protected. Mainly developing countries stand to benefit from (partial) liberalisation of agriculture.

In the High Growth scenario many poor countries catch up, though not completely, with rich countries. Non-OECD countries grow at a per capita rate of 5%. Only few countries have been able to maintain such a growth rate for two decennia or more. However, this is not the only reason for the sometimes drastic changes that the scenario projects. International specialisation becomes more and more pronounced during the scenario period in response to liberalisation of goods markets and lower transport cost. Besides, especially in developing countries factor endowments are projected to change significantly. At least three developments are worth mentioning. First, in some regions, for example the Former Soviet Union, the savings rates are thought to increase. This is a logical element in the scenario. Higher growth rates in combination with more prudent fiscal policies are assumed to raise the propensity to save. Second, the projections by Ahuja and Filmer (1995) show that education in developing countries will improve, although at the end of the scenario period education is still inadequate by the standards of OECD countries. Third, the process of development is partly driven by sectoral reallocation of labour: from low-productivity to high-productivity sectors. This reallocation implies that overall the supply of low-skilled workers in efficiency units rises.

The next section elaborates the last element in the scenario. It takes a closer look at sectoral reallocation in the process of development. The section however starts with clarifying the distinction between low-productivity and high-productivity sectors in the model

4. The macroeconomic effects of the informal sector

Having characterized WorldScan and in particular the informal sectors we are now ready to discuss the macroeconomic role of labour reallocation. In particular, this section analyses the effects on economic growth, production and trade patterns, and wages. Two simulations highlight the effects of declining informal sectors. The first simulation keeps the allocation of workers across low- and high-productivity sectors constant. By this assumption the simulation differs from the High Growth scenario. The second simulation coincides with the High Growth scenario and therefore assumes an outflow from low- to high-productivity sectors. Comparing the two simulations reveals the effects of labour reallocation. First, we describe the impact on economic growth. Then, we pay attention to production and trade patterns and to relative wages. Finally, we present the results from sensitivity analysis. We have experimented with variations in the pace of labour reallocation as well as in the wage difference between formal and informal activities (at the start of the scenario period).

Economic growth

Labour reallocation is a source of economic growth. This can be uncovered in two ways. The first one is a growth-accounting exercise. The second one is to compare economic growth in the simulations with and without labour reallocation. We present the results of both methods, starting with the growth-accounting exercise.

An advantage of growth-accounting is that changes in production can be ascribed to changes in the different productive factors separately. Table 4.1 attributes average economic growth between 1996 and 2020 to changes in the supply of low-skilled and high-skilled labour, employment changes as a result of reallocation, the capital stock and total factor productivity.

Table 4.1 Growth accounting

annual contributions of several productive factors 1996 - 2020.

	OECD	China	South-East Asia	South Asia & Rest	Rest of World
high-skilled labour supply	0.0	0.4	1.1	1.0	1.1
low-skilled labour supply	0.0	0.1	0.2	0.4	0.4
labour reallocation	0.0	0.8	0.4	0.6	0.1
capital accumulation	1.1	3.1	2.7	2.9	2.3
total factor productivity	1.5	3.5	2.4	2.2	1.7
gross domestic product	2.6	8.0	6.9	7.1	5.6

In the OECD population growth is slow and the possibilities for further schooling are limited, so that this region has to rely on capital and technical progress to achieve growth. In the other regions technical progress is relatively less important. Their incomes increase as a result of labour supply growth, education and labour reallocation from low-productivity to high-productivity sectors. The flow from the low-productivity sectors contributes at least ½ percentage point per annum to the growth rate in Asia. Elsewhere labour reallocation is less important, because the size of the informal sector is modest in Eastern Europe, Former Soviet Union, Latin America and the Middle East (see Table 2.2).

The growth-accounting exercise in Table 4.1 underestimates the role of the informal sectors in the process of economic growth. It gives an estimate for the direct effect of labour reallocation -- the 3rd row in Table 4.1 -- but does not distinguish the effects on income through extra capital accumulation. Higher employment in the formal sectors brings higher income, part of which is saved and invested, leading to a further increase in production and income. The income effects of extra capital accumulation are

uncovered by comparing the annual growth rates in simulations with and without labour reallocation in Table 4.2. (Our simulation with labour reallocation is the same as the one in Table 4.1.)

Table 4.2 The growth effect of labour reallocation in Asia
simulations with and without labour reallocation
annual GDP growth 1996-2020

	China	South-East Asia	South Asia & Rest
without reallocation	7.0	6.4	6.6
with reallocation	8.4	7.2	7.6

From Table 4.2 we would conclude that labour reallocation contributes for about 1 percentage point per annum to economic growth in South-East Asia and South Asia & Rest and nearly 1.5% in China. Combining the results in Table 4.1 and 4.2 gives the growth effect of extra capital accumulation -- the difference between the total effect in Table 4.2 and the imputed effect of extra labour inputs in Table 4.1. The effect of capital accumulation amounts to about 0.5 percentage points per annum. This result reflects that the share of capital in production costs is approximately 40% (The GTAP data show that in developing countries the capital share is typically higher than in developed countries.) In the growth-accounting exercise the effects of labour reallocation on growth are attributed to extra labour and capital inputs in the production process. Assuming a capital share of 40% and equal growth rates of capital and GDP , it follows that if the total effect is on average 1 percentage points each year, the contribution of extra labour inputs is about 0.6 percentage points and the contribution of extra capital inputs amounts to 0.4 percentage points.

The finding that labour reallocation brings on average 1 percentage point extra growth, corresponds to other estimates. The World Bank (1996) claims that in China reallocation from the low-productivity agricultural sector to more productive (manufacturing) sectors between 1978 and 1994 raised economic growth with about 1% a year. check It concerned about 20% of the total labour force which is on average similar to labour reallocation in the simulations. WorldScan however shows that labour reallocation is a important source of growth, not only in the past but also in the future.

Trade

The informal sector is a large pool of reserve labour. The inflow into the high-productivity sectors exerts a downward pressure on wages and production costs. For that reason we expect that labour reallocation not only improves production opportunities but also further specialization in labour-intensive goods and especially in low-skilled

labour-intensive goods. Table 4.3 presents for various regions the shares in aggregate value added of three types of sectors: traditional; modern and intensive in low-skilled labour; modern and intensive in high-skilled labour. Agriculture and Consumer Goods are low-skilled intensive and Capital, International Transport, and Services are high-skilled intensive. In the first simulation labour reallocation does not take place, whereas in the second it does. Table 4.3 shows the different production patterns in the two simulations.

Table 4.3 **Production patterns in various regions**
simulations with and without labour reallocation
value added shares in 2020 (%)

	Informal sector		Low-skill intensive[1]		High-skill intensive[1]	
	Level[2,3]	Difference	Level[2]	Difference	Level[2]	Difference
OECD	-	-	9.8	-0.5	84.4	0.5
China	8.2	-4.8	13.1	3.4	68.4	1.1
South-East Asia	3.4	-2.2	14.5	1.3	74.3	0.6
South Asia & Rest	8.1	-3.8	19.1	2.1	65.8	1.6
Rest of the World	1.7	-0.8	16.4	0.1	69.4	0.6

[1] Agriculture and Consumer Goods are defined as low-skilled labour intensive goods. The sectors Capital Goods, International Transport, and Services are high-skilled labour intensive. The remaining sectors are skill neutral. Taken together all shares add up to 100% for each region.

[2] The level in the simulation without labour reallocation.

[3] The relative value added of the informal sector is lower than in 1995 even without labour reallocation (compare Table 3.2). This is the effect of increasing productivity differences between low- and high-productivity sectors over time.

From the value added shares in the simulation without reallocation it is clear that the Asian regions specialize in the production of low-skilled labour-intensive goods, while the OECD specializes in production of high-skilled labour-intensive goods. Labour reallocation intensifies this specialization pattern. Note that the decline of the informal sectors has the effect to raise the share of the other two sectors. However, the increase in the share of low-skilled labour intensive goods is larger than the increase in share of high-skilled labour intensive goods. The results of the simulation neatly fits the traditional Heckscher-Ohlin analysis.

Wages and employment

Labour reallocation lowers employment in the low-productivity sector and exerts a downward pressure on wages for low-skilled in the high-productivity sectors. Table 4.4 presents the effects on wages for the Asian regions. The other regions are less interesting because reallocation is not as dominant as it is in Asia.

Table 4.4 Wages and employment in Asia
simulations with and without labour reallocation in 2020 (%)

	China	South-East Asia	South Asia & Rest
wages of low-skilled workers (relative difference)	-52.2	-34.0	-40.0
wages of high-skilled workers (relative difference)	37.0	20.4	28.6
low-productivity employment (% of labour supply, simulation without allocation)	63.4	37.7	61.9
change in low-productivity employment (% of labour supply, absolute difference)	-28.2	-22.0	-22.2

Table 4.4 shows that the reduction in low-productivity employment of about 20 percentage points lowers the wage for low-skilled workers in the formal sector with about 35 to 40 percentage points in South-East Asia and South Asia & Rest. The extra inflow in the formal sectors makes the high-skilled workers more productive. As a result, their wages go up. The outflow is higher in China due to a higher GDP growth per capita. Consequently, the effects on wages in the formal sectors are larger.

This section has shown the macroeconomic effects of labour reallocation from the low-productivity sector to the high-productivity sectors. A reallocation of about 20% of the total labour force in 25 years time implies a boost in economic growth of 1 percentage point per annum in developing regions. It also exerts a downward pressure on wages, especially those of low-skilled workers. Developing regions specialize more in labour intensive and skill *ex*tensive sectors. The effects on the OECD on the other hand are very modest. Nevertheless, since developing regions specialize in low-skilled labour-intensive goods, the OECD is forced to specialize more in the production of high-skilled labour intensive goods.

sensitivity analysis

The simulation results rest on the assumption that about 20% of the labour force shifts from low-productivity to high-productivity sectors, see the fourth row in Table 4.4. This is of the same order of magnitude as reallocation in China from agriculture to industry and services in less than twenty years, between 1978 and 1994 (Sachs and Woo, 1997). Besides, the flow of labour in the simulations also parallels the outflow from agriculture in many other developing countries in the recent past, (see Table 3.1). In a period of 30 years the outflow in Indonesia, Brazil and Russia was in between 20% and 30% of the total labour force. Therefore, the pace of reallocation in the simulations seems reasonable and even plausible.

However, the pace of reallocation cannot be predicted perfectly. More importantly, information about the wage or productivity difference between informal and formal activities is scarce, and consequently the uncertainty about this difference is large. In view of this uncertainty about the pace of reallocation and the wage difference between formal and informal activities we want to consider alternative values for these two variables. This allows us to trace the impact of the initial assumptions about the pace or reallocation and the wage difference.

Particularly, we have run two sets of two simulations. In the first set the flow of workers becomes variable. Again, we employ an equation linking the flow of workers to GDP per capita. The coefficient for (the logarithm of) GDP per capita has been given a different value twice: 10 and 20 instead of 15. In the latter case the regression result in section 3 is reproduced. These changes imply fairly large deviations from the simulations that have been presented up to now. For South-East Asia and South Asia the High Growth scenario assumes that about 20% of the labour force will be reallocated. When the coefficient is set equal to 10 only about 14% shifts from informal to formal activities, and when the coefficient is set equal to 20 the fraction of reallocated workers becomes as much as 28%.

Table 4.5 Varying the pace of reallocation
difference annual growth with and without labour reallocation

	Relative change in labour outflow		
	-33%	0%	33%
China	0.98	1.36	1.70
South-East Asia	0.65	0.79	1.02
South Asia & Rest	0.72	1.03	1.31

Clearly, the consequences of different assumptions are significant. The growth rate in the low and the high case differs about half percentage point or more and this amounts to a substantial income difference after 25 years (between 10 to 20 percentage points).

Moreover, we have run a set of two simulations in which the initial wage differences becomes variable. The parameter *C* in equation (1) which has originally been assigned a value of 6¾, is lowered to 5 as well as raised to 10, respectively. As a result, the productivity differences between the low- and high-productivity sectors change. While the ratio of wages for low -skilled in the high-productivity sectors to wages in the low-productivity sector was 4 in the initial simulation for China, it is now 3 (*C = 5*) and 6 (*C = 10*), respectively. This affects the efficiency gains of labour reallocation. The effects on GDP are however quite modest as can be seen in Table 4.6. The differences in the annual GDP growth are about 0.2%, which cumulates to about 5% of GDP in 2020.

Table 4.6 Varying the wage difference
difference annual growth with and without labour reallocation

	Change in productivity difference in 1995		
	-25%	0%	50%
China	1.24	1.36	1.49
South-East Asia	0.75	0.79	0.84
South Asia & Rest	0.95	1.03	1.11

Table 4.5 and Table 4.6 seem to support the conclusion that reallocation from traditional to modern activities is and will be an important source of growth. Even if the flow of workers becomes considerably less and amounts to only 14% of the labour force, the growth effect is more than a half percentage point in South-East Asia and South Asia and even larger in China.

5. Productivity shocks

Sachs and Woo (1997) stress that the Chinese reforms in agriculture were not only successful because they raised productivity substantially. The productivity growth in agriculture itself eventually petered out. More than a short-lived burst in productivity growth, the subsequent flow of cheap labour towards other sectors of the economy was a success of the reforms at the end of the seventies. Rural industries surged, creating

more than 100 million new jobs, as a result of the abundant supply of workers in combination with a policy to at least tolerate the expansion of these industries.

This section takes up this idea and formally analyses the role of an elastic labour supply in the development process. We consider the consequences of a productivity shock in the modern parts of agriculture and manufacturing separately. First, a productivity shock in agriculture and in manufacturing is assumed while freezing the labour allocation between low- and high-productivity sectors. Second, a productivity shock is accompanied by an endogenous flow towards the high-productivity sectors. These simulations allow us to isolate the effects of a productivity shock through the induced reallocation of workers. The multiplier is separately derived for agriculture and for manufacturing.

The results show that labour reallocation is especially important if productivity in agriculture increases. The reason is that a productivity shock in high-productivity agriculture makes agrarian workers in the low-productivity part of this sector redundant. This result implies that governments can stimulate labour reallocation by reforming high-productivity sectors that directly compete with the low-productivity sectors. As we know from section 4 the flow towards the high-productivity sectors raises economic growth, increases specialization and exerts a downward pressure on the wages of low-skilled workers in modern sectors of the economy.

Productivity shock in agriculture

Our first simulation assumes a shock in total factor productivity in high-productivity agriculture which raises output with 10% *ceteris paribus.* As a result prices decrease, demand increases and labour and capital are reallocated between high-productivity sectors given the constraint that relative employment from the informal sector does not change. GDP rises with 1.2% to 1.8% in the Asian regions. The change in GDP is related to the share of agriculture in total value added. This share is relatively lower in South-East Asia than in that China, so that in terms of GDP the shock in South-East Asia is smaller than in China. A similar, second simulation is carried out as well, now including an endogenous change in labour allocation. The effects on employment in the low-productivity sector and GDP are described in Table 5.1.

Table 5.1 A productivity shock in agriculture
the effects in 2020 compared to base simulation.

	China	South East Asia	South Asia & Rest
low-productivity employment rate (absolute difference)	-4.9	-3.5	-3.4
GDP effect due to productivity shock (relative difference)	1.8	1.2	1.5
GDP effect due to reallocation (relative difference, given productivity shock)	3.5	2.4	2.6
GDP multiplier (=row 4 divided by row 3)	2.0	2.1	1.7

The numbers in the first row indicate an absolute difference, while the numbers in het second and third row indicate a relative difference. The GDP multiplier follows from dividing row 3 by row 2.

The increase in output from the high-productivity agriculture sector increases demand for in particular low-skilled labour. The extra demand exerts an upward pressure on wages. Moreover, the decrease in output prices also lowers the returns on labour in the low-productivity sector. As a result, the wage differences increase and workers are stimulated to work in the high-productivity sector. The induced labour reallocation amounts to about 3.5 to 5% of the total labour force. The total GDP effects (adding up row 3 and 4) vary between 3.6% to 5.3% of GDP. Labour reallocation is largely responsible for these effects, as is seen from the multipliers in row 5. The effect of the productivity shock without labour reallocation is only a third of the total effect with labour reallocation. This conclusion corresponds to that of Lee, Radelet and Sachs (1998) who claim that one factor behind Asian growth is the large reserve pool of labour. Also Young (1994) emphasizes that the decline of agriculture is an important factor behind growth.

Productivity shock in manufacturing

The large effects induced by labour reallocation are driven by two factors: increased labour demand by the high-productivity sectors and lower returns on labour in low-productivity agriculture. To make clear which factor dominates, we carry out simulations in which total factor productivity in manufacturing increases such that output rises with 10% *ceteris paribus*. The main difference is that a productivity shock in manufacturing does not lower wages earned with low-productivity activities. In this way one factor that may induce reallocation and may deliver large GDP effects is eliminated.

As a result of the productivity shock in manufacturing prices decrease, demand increases and labour and capital are reallocated between the high-productivity sectors given the constraint that the outflow from the informal sector is not changed. GDP rises with 3.3% to 5.1% in the Asian regions. These initial GDP effects are larger compared to those resulting from a productivity shock in agriculture because the value added of manufacturing is larger than of agriculture. A similar simulation is also carried out including an endogenous change in labour allocation. The effects are described in Table 5.2.

Table 5.2 A productivity shock in manufacturing
the effects in 2020 compared to base simulation.

	China	South East Asia	South Asia & Rest
low-productivity employment rate (absolute difference)	-1.1	-2.2	-2.1
GDP effect due to productivity shock (relative difference)	3.3	5.0	5.1
GDP effect due to reallocation (given productivity shock, relative difference)	0.8	1.5	1.5
GDP multiplier (=row 4 divided by row 3)	0.2	0.3	0.3

The numbers in the first row indicate an absolute difference, while the numbers in het second and third row indicate a relative difference. The GDP multiplier follows from dividing row 3 by row 2.

Table 5.2 shows that the effects induced by labour reallocation are substantially smaller with a productivity shock in manufacturing than a shock in agriculture. Only 1 to 2% of the labour force is reallocated to the high-productivity sectors compared to about 4% in the previous simulations. Consequently, the extra stimulus of labour reallocation is smaller. This result is more pronounced if the extra effect is related to the pure effect of the productivity shock: the multipliers in Table 5.2 are much lower than those in Table 5.1. The extra effect is only about 20% of the total effect while is was about 70% with a productivity shock in agriculture.

From the simulations in this section we conclude that the GDP effects of labour reallocation resulting from a productivity shock are only substantial if this shock occurs in agriculture. Rather than increased labour demand and higher wages in high-productivity sectors, lower wages in the low-productivity sectors tricker reallocation. As labour reallocation often implies regional migration this conclusion corresponds to

the results in the literature on migration. Migration decisions are often based on a bad position in the home country and not as much on improved opportunities in the potential migration country. The effects on other regions, in particular on the OECD, are very modest.

This section has ignored several aspects so far. The simulation results depend on assumptions about substitution elasticities. Both in production (value added) and in consumption these elasticities are typically one, reflecting Cobb-Douglas functions. This is perhaps not always adequate. However, different assumptions are more likely to reinforce the results in this section. Consider two important elasticities of substitution: the one between low-skilled and high-skilled workers and the one between agricultural and other goods. The first elasticity is likely to be larger than one, whereas the second elasticity is likely to less than one. Raising the elasticity of substitution between low-skilled and high-skilled workers is bound to increase the multipliers, irrespective of the sector in which productivity increases. Given an increase in low-skilled employment in the modern sectors, wages of low-skilled workers fall but by less than before, so that the process of reallocation is re-enforced. On the other hand, lowering the elasticity of substitution between agricultural and other goods will increase the multiplier of a shock in modern agriculture. The decrease in prices of agricultural products has to be larger, thereby increasing the wage difference between low- and high-productivity activities and provoking a further reallocation of workers.

6. Conclusions

The excellent performance of China is sometimes surprising, but is certainly not a miracle. Growth- accounting analyses ascribe the high economic growth since the beginning of the eighties to the changes in the capital stock, the labour force and education (see Hu and Khan, 1997). Besides, an important part of the unexplained residual can be attributed to the reallocation of labour from low- to high-productivity sectors. Low-productivity sectors in developing countries mainly consist of self-employed workers who have nearly no acces to capital and modern technologies. Recent publications have stressed the idea that workers in these sectors play a vital role in the process of economic growth because they form a large pool of reserve labour. The flow of low-productivity workers to sectors combining capital, labour and modern technologies efficiently, contributes to economic growth.

This paper assesses quantitatively the macroeconomic effects of labour reallocation from low- to high-productivity sectors, using an applied general-equilibrium model WorldScan. Thereby, we have concentrated mainly on the Asian regions. Simulations show that a reallocation of about 20% of total labour supply raises (per capita)

economic growth about one percentage point per annum from 1995 to 2020. This result is akin to the conclusion of the Worldbank. Our analysis thus suggests that this source of growth has not dried up yet: it is relevant in the two coming decades as well, not only in China but also in other Asian economies. Moreover, labour reallocation induces further specialization of the South-East Asian countries and India towards low-skilled labour intensive products. Their counterparts, the OECD economies, specialize more in high-skilled labour-intensive industries. However, the macroeconomic effects for the OECD countries are limited, even though the simulations are embedded in a scenario in which goods and capital flow easily across borders.

Labour reallocation is spurred by improving productivity in sectors that directly compete with low-wage activities. Simulations with the model establish that labour reallocation magnifies the direct income effect of a productivity shock with a factor 3. This suggests that policy measures that stimulate productivity in agriculture, can lift growth substantially: the multiplier effect through induced labour reallocation is relatively large. China, for example, already experienced some beneficial knock-on effects by reforming agriculture.

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Appendix Regional and sectoral concordances for WorldScan

1 United States	1 Agriculture and food production
2 Japan	Paddy rice, Wheat, Grains, Cereal Grains, Non grain crops, Vegetables, Oil seeds, Sugar cane Plant-based fibres, Crops, Bovine cattle, Animal products, Raw milk,, Wool, Forestry, Fisheries, Processed rice, Meat products, Vegetable Oils, Dairy products, Sugar, Other food products, Beverages and tobacco
3 Western Europe	2 Consumption goods
United Kingdom, Germany, Denmark, Sweden, Finland, Rest of European Union, EFTA	Textiles, Wearing apparels, Leather etc, Wood products, Chemical, rubbers and plastics
4 Remaining OECD	3 Intermediate goods
Australia, New Zealand, Canada	
5 Eastern Europe	Pulp paper, Petroleum and coal, Nonmetallic minerals, Ferrous metals, Nonferrous metals
6 Former Soviet Union	4 Capital goods
7 Middle East and North Africa Turkey, Rest of Middle East, Morocco, Rest of North Africa	Fabricated metal products, Transport industries Machinery and equipment, Electronic equipment Motor vehicles and parts, Rest of manufacturing
	5 Services
8 Sub-Saharan Africa South African Customs Union, Rest of Southern Africa, Rest of Sub-Saharan Africa	Gas manufacture and distribution, Water, Construction, Financial, business and recreational services, Public administration, education and health, Dwellings, Electricity
	6 Trade and Transport
9 Latin America	7 Raw Materials
Central America and Carribean, Mexico, Argentina, Brazil, Chile, Uruguay, Venezuela, Colombia, Rest of South America	Oil, Gas, Coal and Minerals
10 China	
China, Hong Kong	
11 South East Asia	
Republic of Korea, Indonesia, Malaysia, Philippines, Singapore, Thailand, Taiwan, Vietnam	
12 South Asia & Rest	
India, Sri Lanka, Rest of South Asia, Rest of the World	

Abstract

In developing countries labour reallocation from traditional, low-productivity sectors towards modern, high-productivity sectors is an important source of economic growth, and a driving force behind specialization. Simulations with the applied general-equilibrium model WorldScan show that Asian countries can expect up to a 30 percent increase in income per capita or, equivalently, slightly more than one percentage point extra annual growth during a period of 25 years. Moreover, our results suggest that labour reallocation is mainly induced by productivity increases in agriculture that push redundant labour towards modern industrial sectors.