

Chapter 2

Decoupled Payments: A Dynamic, Economywide Perspective

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Decoupled payments, introduced in the 1996 Farm Act and renewed in 2002, are lump-sum income transfers to farm operators independent of their current production, factor use, or commodity prices. This chapter considers whether decoupled payments may alter producers' resource allocation over time and lead to effects on production. We use a dynamic, economywide applied general equilibrium (AGE) model to simulate the effects of annual decoupled payments in U.S. agriculture over time. The dynamic, intertemporal dimension is necessary because a stream of annual payments can be expected to influence recipients' decisions about how much to consume versus save over a long-term time horizon. An economywide approach is important because the payments redistribute income from urban to rural households, and may result in sectoral changes in resource allocation within the economy. The main link between decoupled payments and agricultural production in this framework is through recipient households' decisions to invest in agricultural assets.

Can Decoupled Payments Have Neutral Market Effects?

Decoupled payments increase the income and wealth of recipient households. In response, over time, these households are likely to consume more goods and to increase savings. However, whether these individual household decisions affect resource allocation and aggregate levels of agricultural production depends on the behavior of those that are taxed to provide the transfer. Effects on recipients can exactly offset the consumption and investment effects of those taxed such that, after the transfer, resource allocation and production at the market level are unaffected. Generally speaking, this result occurs when recipient households have consumption and savings patterns in proportion to their income that is identical to those paying for the subsidy. Under these circumstances, the wealth effect of a transfer on recipient behavior is offset by the negative wealth effect on those taxed to provide the transfer.¹³ Of course, in real economies, identical taxed/recipient preferences are unlikely.

A neutral outcome depends on other conditions as well, including the availability of financial capital markets that work perfectly to allocate savings to investors in all sectors of the economy, the presence of opportunities to insure against future risks, and the absence of fixed costs. These conditions, too, are unlikely to prevail in real markets. For example, agricultural capital markets differ from nonfarm capital markets. Unlike corporations, farmers cannot issue securities or bonds to finance farm activities; instead, they must rely on land and other assets for collateral. Thus, segmented capital markets can lead to different capital effects on individuals outside agriculture, who

¹³ Also, individual preferences can be identical but differ in the share of disposable income spent on goods and services at different income levels. In this case, the behavior of recipients can differ from that of taxed individuals, with the result that transfer payments can affect market allocations over time.

are taxed, than on recipients in agriculture. This effect might be greater if farmers face liquidity constraints or if they prefer to invest in agriculture that share of decoupled payments not allocated to consumption. The difference in these diverged capital markets does not imply that returns to capital in agriculture departs from returns in other sectors of the economy, at least in the long run, since farm households also invest in stocks, bonds, and other financial instruments (USDA, 2003). However, in the short run, an increase in agriculture's capital stock should lead to production effects — but to what extent?

Direct payments are targeted to land planted to program crops in the base period, and so lead to an increase in land asset values. A change in the price of land affects wealth. Consequently, payments can affect the investment and consumption behavior of those who own land, since landowners likely try to equate (risk and tax-adjusted) returns across all assets in their portfolio, including land. In addition, since land is used as collateral, payments might increase access to capital for those farmers who face credit constraints.

An Intertemporal, Economywide Model Analysis: Bracketing Two Outcomes

We use two versions of an intertemporal, economywide model of the U.S. economy to simulate decoupled payments in U.S. agriculture.¹⁴ One version presumes that ideal conditions hold in capital markets: the markets in agriculture and the rest of the economy are perfectly integrated so that any differences in shortrun rates of return to capital and land are instantly arbitrated to zero. In the second version, we assume recipients' investment alternatives are strictly limited to agricultural assets. Credit constraints, investment preferences, or restricted investment opportunities could contribute to such segmentation. In fact, U.S. farm households hold diversified investment portfolios – evidence that agricultural capital markets are not fully segmented (USDA, 2003). The two scenarios we describe should be considered as bracketing the possible outcomes of the decoupled payments.

The models otherwise are identical in their specifications. Households are presumed to hold identical preferences at all income levels for consumption of goods and services. Household consumption and savings decisions respond to changes in prices and returns. Assets are aggregated into three broad categories—capital in agriculture, capital not in agriculture, and land. The model is calibrated to represent 1997, while rates of growth in total factor productivity, growth in the U.S. labor force, and selected other parameters are taken from other research for the baseline run. The model reproduces key outcomes observed for the actual economy in 1997-2001.

We assume that decoupled payments, equal to \$6.112 billion in 1997, are made to farmers each year from 1997 on. Thus, our results suggest the directional effects of direct payments rather than the exact magnitude. All results are compared with the base, or the path of the economy without direct or other payments to farmers.

¹⁴ See Roe et al. (2002) for details of the analysis and the underlying AGE model.

The Case of Integrated Capital Markets

This analysis presumes that investors allocate savings so as to arbitrage away any differences in returns to the three assets (land, agricultural capital, and capital in the manufacturing and service sectors). Effectively, the rate of return to agricultural capital is maintained at the same rate as returns to capital in the rest of the U.S. economy. Since household preferences are assumed to be identical, consumption and investment behavior of the recipients of decoupled payments are exactly counterbalanced. As a result, when the payments are not tied to production or prices, they have no effect on production levels, even over time.

However, since payments are linked to “program” acres, land values are affected. The \$6.1-billion annual payment, in the short run, causes land values to exceed their base-level values by almost 9 percent (fig. 2-1). Land values then taper off to about 8.3 percent above their longrun base value. Many studies have documented that decoupled payments, even though they aim to benefit farm households, have an important side effect—to raise land values. For example, Goodwin et al. (2003a, 2003b) found that decoupled payments have had small effects on land values, ranging from 2 to 6 percent in the Northern Great Plains and Corn Belt regions. Bernard et al. (2001) found larger effects in a study that included both coupled and decoupled payments. Our analysis also finds higher land values.

These land value effects are due solely to decoupled payments. Competition for land (and a right to the payment) causes renters to pay higher rates to owners. If the land is sold, the buyer is willing to pay more if the payment remains tied to the land. Of course, decoupled payments and the rise in land values change recipients’ consumption patterns and level of assets. In the short run, asset values of recipient households rise by about 2 percent above their base values, due mostly to the rise in land values. Most of the payments are spent on consumption; this proportion rises over time while the proportion saved falls. Total consumption expenditures are about 0.8

Figure 2-1

Decoupled payments’ effects on land values are similar with segmented, nonsegmented capital markets

Percent increase in cropland values relative to base

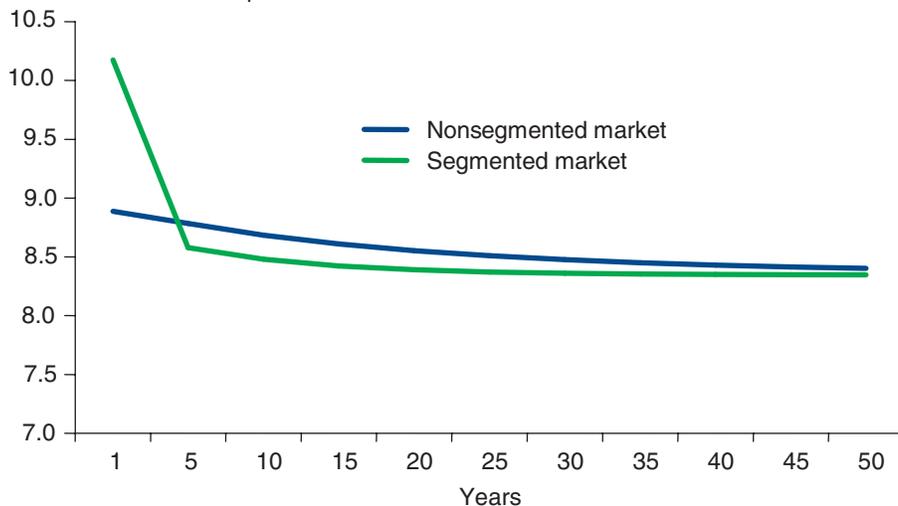
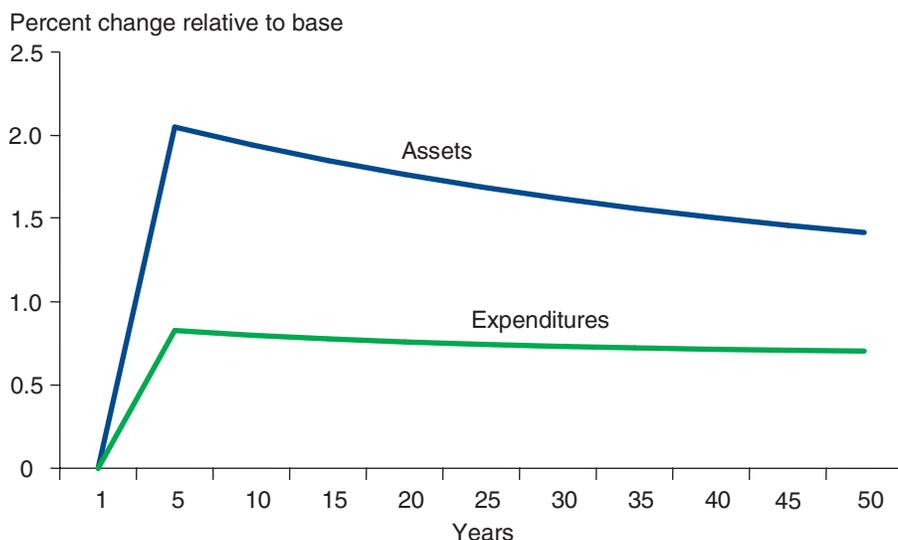


Figure 2-2

**Decoupled payments increase assets and consumption expenditures:
nonsegmented capital market**



percent higher than expenditures in the absence of transfers (fig. 2-2). The rise in the value of assets held by recipient households should also increase their access to credit. If liquidity constraints are binding, then PFC payments may not be decoupled in that sense.

The Case of Segmented Capital Markets

In the second version of the model, we assume that capital markets in agriculture are segmented from those in the rest of the economy – farmers are assumed able to invest payments only in agricultural assets. Within agriculture, and within the rest of the economy, rates of return are equalized, but returns to agricultural assets are no longer perfectly arbitrated with nonagricultural assets (although they are in the long run.)

With segmented markets, within the first 10 years of payments, the rate of return to agricultural capital declines by a modest 0.1 percent (fig. 2-3) below the capital rental rate observed in the base scenario. The effect on the returns to capital outside agriculture and on the price index of goods is almost imperceptible. And, even though direct payments continue in equal amounts throughout the period, agriculture’s return to capital slowly converges with that of the rest of the economy. In other words, in spite of the presumed differences between agriculture and the rest of the economy, in the long run, direct payments do not distort the rate of return to capital in agriculture.

Figure 2-4 shows why direct payments cause returns to agricultural capital to decline. In early periods, farmers tend to allocate more of their payments to investment in agricultural assets than in later periods. In the short run, the amount of capital invested in agriculture rises to about 0.25 percent more of the capital stock than would otherwise be accumulated (relative to the base). As additional capital investments lead to diminishing returns to capital stock, farmers save less and spend more of their decoupled payments on final goods. In the long run, the amount of capital employed in agriculture is equal to the amount that would be employed without transfer payments; in

Figure 2- 3

Decoupled payments lower on returns to capital in agriculture: the segmented capital markets case

Percent change relative to base

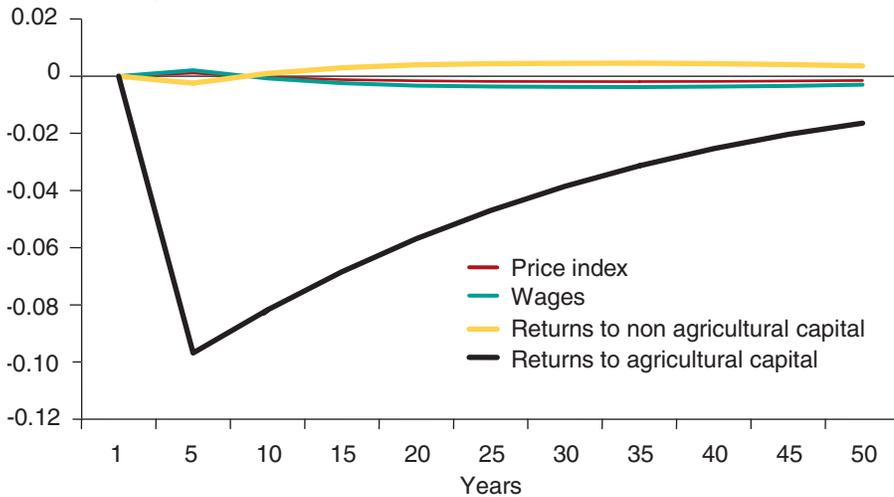
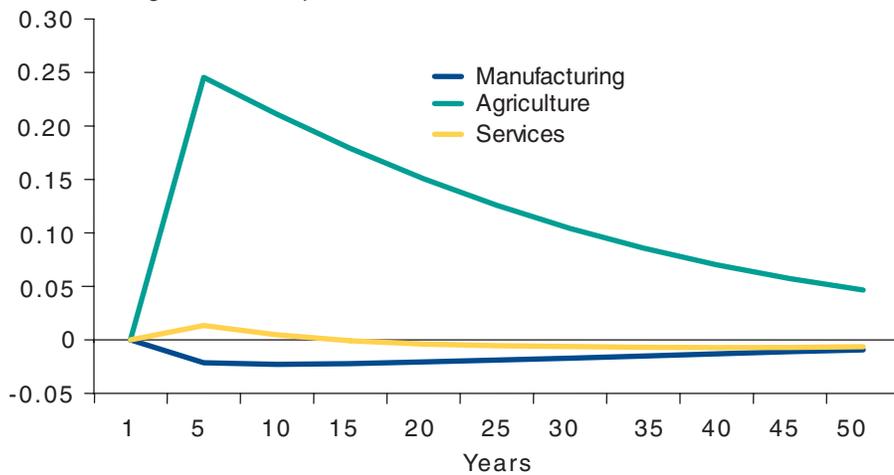


Figure 2-4

Decoupled payments have small effects on the stock of capital in agriculture: the segmented capital markets case

Percent change in sector capital stock relative to base



other words, payments do not affect the longrun level of capital stock in the sector. Nevertheless, the half-life of the adjustment is about 25 years because the depreciation rate for buildings and structures is minor. The effect on capital stocks in the rest of the economy is almost imperceptible.

As farmers increase their levels of capital stock, more labor hours, relative to the base, are also allocated to production (fig. 2-5). These hours come from a combination of reduced leisure time and more hired labor.¹⁵ Decoupled payments encourage the employment of capital relative to labor (fig. 2-6). This is because the assumed preference for investing in agriculture causes the rate of return to capital to fall slightly relative to the change in wages. The change in the wage-rental ratio encourages more substitution of capital for labor relative to the base. In the long run, the wage-rental ratio converges to the level expected in the absence of payments.

¹⁵ Since leisure is typically found to be a normal good, although not modeled explicitly in this report, the combination of wealth and price effects would likely leave the average level of leisure consumed by farmers to be virtually unchanged. The slight increase in agricultural labor in the segmented market case relative to the base year, comes from the hired labor market. Nevertheless, in absolute terms, in all of the analysis, there is an outmigration of labor from agriculture.

Figure 2-5

Decoupled payments cause a small increase in agricultural employment: the segmented capital markets case

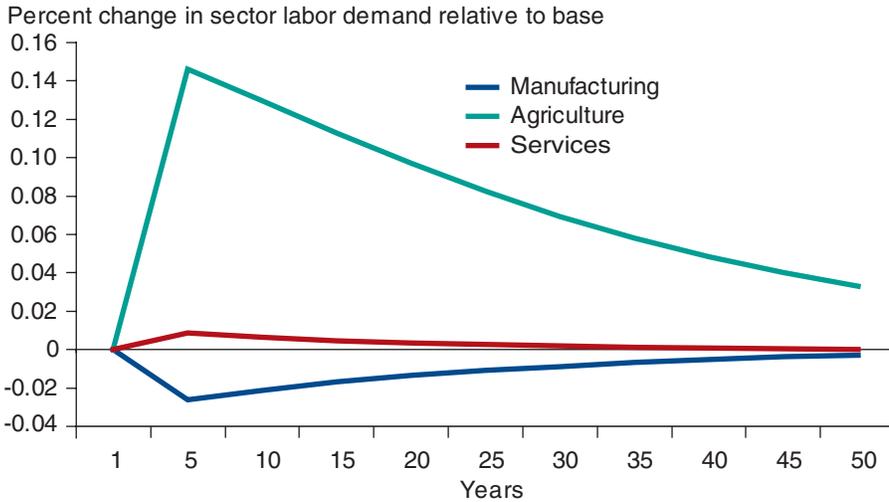
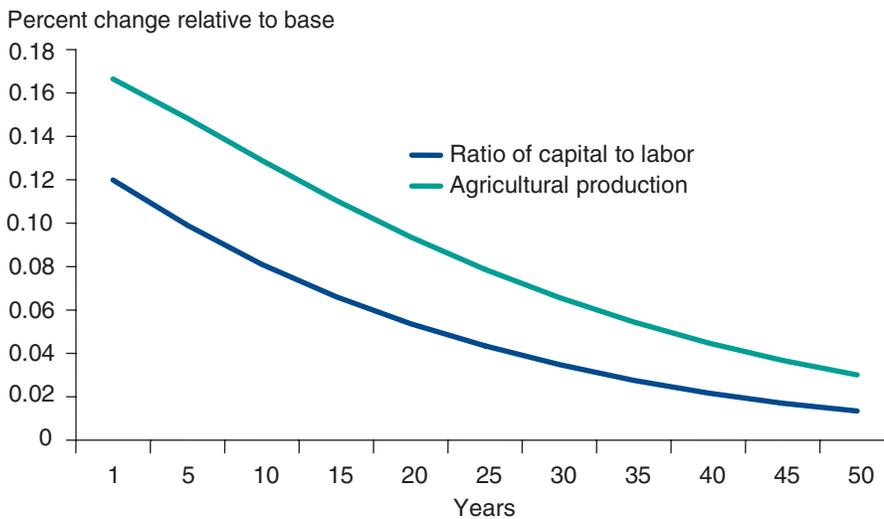


Figure 2-6

Decoupled payments cause small shortrun increase in agricultural production and in use of capital relative to labor: the segmented capital markets case



The decline in agriculture’s rate of return to its capital stock also affects the price of land. As agriculture becomes more capital-intensive and returns to agricultural capital fall (shown in fig. 2-4), the returns to land rise. Land prices in the first 5 years of the simulation rise to a greater extent than in the case where capital markets are assumed to be nonsegmented, by roughly 1 percentage point in the short run (fig. 2-1). After 5 years, land values become similar to those of a nonsegmented capital market. Effectively, with decoupled payments, the segmented capital market speeds up agriculture’s capital accumulation and convergence to its longrun equilibrium.

Finally, do the resource allocation effects of decoupled payments affect aggregate agricultural production? U.S. agricultural production rises by an estimated 0.17 percent of its base value in the short run. In the long run, output returns to approximately the levels that would prevail in the absence

of payments (fig. 2-7). The effect that prevails in the long run is the elevated price of land (8.4 percent).

Conclusions

Are decoupled payments to farmers likely to affect resource allocation in agriculture? If not, decoupled payments can be thought of as an efficient policy instrument to transfer resources from one segment of the population to another, with minimal distortion of production or trade. Since the real economy is obviously complicated and encumbered with imperfect markets, this is a complex question. Our contribution lies in showing the circumstances under which payments have minimal market distortions. We also consider the most stringent capital market imperfections – when recipients’ investment opportunities are restricted to agriculture – and show just how distorting these payments might be.

Our economywide analysis finds that if agricultural capital markets are perfectly integrated with capital markets in the rest of the economy and if the taxed and recipients hold identical preferences for goods and services, then the key effects of payments over time are to increase the value of land by about 8 percent and, of course, to increase the wealth of program recipients and their expenditures on final goods.

If we presume that farmers invest in agriculture that portion of decoupled payments not spent on consumption, payments seem to affect resource allocation and production. Over the long run, recipient households respond to declining rates of return to agricultural capital by increasing their consumption and lowering their savings rate until rates of return between agricultural and nonagricultural assets are re-equilibrated. As a result, the small production increases in the short run, less than 0.2 percent, become negligible in the long run. The only long-term effect of payments is to increase land values.

Figure 2-7

Decoupled payments have small and declining effects on output but lasting effects on land values and land rental rates: the segmented case

